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USM
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3rd
Joint
Conference
UNAIR-USM

Abstract Book

**INTERNATIONAL
CONFERENCE
OF PHARMACY AND
HEALTH SCIENCES 2020**

October 27-28th, 2020



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Welcome Message from Rector of Universitas Airlangga



Honorable representative from School of Pharmaceutical Science, University Sains Malaysia.

Honorable speakers

From the School of Pharmaceutical Sciences, USM, Malaysia,

From the Faculty of Pharmaceutical Sciences Naresuan University Thailand,

From ANZAC Research Institute - Concord Clinical School Sydney Australia, and also from the Faculty of Pharmacy - Universitas Airlangga Indonesia,

Honorable presenters, researchers, and students.

Assalamualaikum Wr. Wb.

Good morning and a very warm welcome for all of you at The International Conference of Pharmacy and Health Sciences 2020. It is with great pleasure for Universitas Airlangga to be able to organize the third joint conference together with Universiti Sains Malaysia. The conference provides a forum for the exchange of information on natural products and related topics as well as aims to build and strengthen scientific cooperation amongst research institutions. Universiti Sains Malaysia has been a Universitas Airlangga's strong partner globally. Hence, we are very grateful to have this event together.

Ladies and Gentlemen,

We welcome academics, researchers, industrial practitioners, and students to participate in the discussion on pharmaceutical sciences that ranges from wound healing and the use of medicinal plants, traditional and complementary medicine, to the growing use of herbal medicines. In conjunction with the conference, pre-conference workshops also available covering two topics, such as Computer-Assisted Drug Design (CADD), and HPTLC Fingerprinting as a Quality Control of Herbal Product.

The use of herbal medicinal products and supplements has increased tremendously over the past decades with not less than 80% of people worldwide relying on them for some part of primary healthcare. It is important to put together the knowledge, skills, and practices based on the theories, beliefs, and experiences on complementary and alternative medicine.

All these, whether explicable or not, shall be used in the maintenance of health. Not just that, it shall be used as well in the prevention, diagnosis, improvement, or treatment of physical and mental illnesses. Pharmaceutical Analysis and Pharmaceutical technology need to be expanded to answer the challenge in herbal medicine because, in the past, many people rely exclusively on experience or observation handed down from generation to generation, verbally, or in writing.

The popularity and evidence of continued research-use base, clearly indicates that there are still lessons to be learned from traditional practices, especially regarding pharmacology and biomedical sciences. Although natural product drug discovery has shown promising potentials in the practice of herbal products, many of them remain untested and their use is either poorly monitored or not even monitored at all. Therefore, the development of modern scientific medicine is still needed to be explored, which may include clinical and community pharmacy.

Ladies and Gentlemen,

We do hope that this third joint conference with University Sains Malaysia can benefit society at large, especially in the study of pharmaceutical sciences in pursuing unexplored combinations, that could have a place in contemporary scientific medicine.

The conference is also part of our program aimed to increase the number of international research and publications, and therefore, it is important to establish an international collaboration that leads to international publication. Let's not forget that we need to continue establishing the global academic community through the development of leading, innovative, and independent international activities such as this conference. For Universiti Sains Malaysia, we do expect that this collaboration can be strengthened and even more, be sustainable for years to come.

Thank you very much for your kind attention, and I hope that you will have a fruitful discussion.

Prof. Moh. Nasih
Rector of Universitas Airlangga

Welcome Message from Dean of Faculty of Pharmacy, Universitas Airlangga



Assalamu'alaikum warahmatullahiwabarakatuh,

Welcome to Surabaya,

It is a great pleasure to welcome all distinguished speakers and all participants to Surabaya in The International Conference of Pharmacy and Health Sciences 2020, 3rd Joint Conference Universitas Airlangga (UNAIR) - Universiti Sains Malaysia (USM) on October 27-28, 2020. This Joint Conference has a big theme "Research Acceleration in Pharmacy and Health Sciences through International Collaboration".

Due to the coronavirus (COVID-19) as global pandemic and your safety is our priority, this scientific conference will be held through video conference (VICON). This international conference is one way to maintain our academic reputation and research reputation, as we know by disseminating our research to other scientists and academics; and the University will be highly recognized and perhaps highly cited.

This conference covers topics of interest including Complementary and Alternative Medicine, Pharmaceutical Analysis, Pharmaceutical Technology, Pharmacology and Biomedical Sciences, Natural Product Drug Discovery, Clinical and Community Pharmacy and other related topics. This is also as a forum to facilitate academia, researchers, industrial practitioners, and students engaged in this scientific event.

We hope we can expand our international research collaborations especially in building research capacity in terms of talents of researchers, the abundance of resources or research facilities and management of research. This is the best way to work hand in hand to solve some global health issues especially in pharmaceutical and healthcare field and to achieve healthy and better quality of life.



3rd Joint Conference

INTERNATIONAL CONFERENCE OF
PHARMACY AND HEALTH SCIENCES 2020



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We would like to express our appreciation to the Organizing Committee, for the good teamwork and their effort to prepare this successfully conference.

Finally, we wish all participants have an enjoyable virtual meeting in Surabaya.

Wassalamualaikum warahmatullahi wabarakatuh.

Prof. apt. Junaidi Khotib, M.Kes., PhD.
Dean of Faculty of Pharmacy
Universitas Airlangga

Welcome Message from Deputy Vice Chancellor (Academic & International) Universiti Sains Malaysia



Professor Mohammad Nasih, Rector, Universitas Airlangga, Indonesia
Professor Junaidi Khotib, Dean, School of Pharmacy, Universitas Airlangga, Indonesia
Prof. Dr. Habibah A. Wahab, Dean, School of Pharmaceutical Sciences Universiti Sains Malaysia
Distinguished speakers and guests

Ladies and gentlemen,

Assalamualaikum warahmatullah wabarakatuh, and a very good morning,

On behalf of USM, I am very pleased and grateful that once again we have been given the opportunity to co-organize International Conference of Pharmacy and Health Sciences 2020, 3rd Joint Conference of UNAIR-USM with Universitas Airlangga. The theme of this event is the "Research Acceleration in Pharmacy and Health Sciences through International Collaboration". As the theme suggests, this conference was held with the objective to accelerate the research in the pharmacy and health sciences, through the collaboration of both Universiti Airlangga, Indonesia and Universiti Sains Malaysia, through the organization of this conference. In this conference, we will indulge with a number of valuable findings from various research topics, namely Complementary and Alternative Medicine, Pharmaceutical Analysis, Pharmaceutical Technology, Pharmacology and Biomedical Sciences, Natural Product Drug Discovery, Clinical and Community Pharmacy and others.

It has been well known that research acceleration can be achieved through collaborations and sufficient communication on the results and discoveries. Thus, I hope that this event will be an excellent platform for all participants to engage with the works from all speakers and presenters as well as get to know each other to foster existing and future collaboration. I would like to quote this proverb, "If you want to go fast, go alone, if you want to go far, go together"

Ladies and gentlemen,

I was told that the history of this joint conference began in 2007, when the first conference was hosted by the School of Pharmaceutical Sciences, Universiti Sains Malaysia. It was followed by the second collaboration in 2009 hosted by Universitas Air langga. Even though the last conference was more than 10 years ago, I am delighted that this joint conference has been reinforced once again and hopefully the strong bond between UNAIR and USM will sustain. It has been a challenge in the beginning, where we are faced with the COVID-19 pandemic situation, making the physical conference impossible. However, together, we will overcome the challenges, and inshaAllah successfully transform the physical to a virtual conference.

And with that, I would like to express my appreciation to the Rector of UNAIR, Respected Professor Mohammad Nasih who recognizes this strong relationship and supports this momentous event. I would also like to thank and congratulate all the committee members both form UNAIR and USM for the hard work and dedication to make this event possible, amidst all the challenges. We hope that with this joint conference, our relationship between the two universities will be more dynamic and stronger in the future.

And finally, to all participants, again, I would like to express my warm welcome to all of you to this conference, and hopefully you will have an enjoyable and unforgettable virtual conference with new insights, ideas and partnerships.

Wassalamualaikum warahmatullahi wabarakatuh.

Professor Dato' Dr Ahmad Farhan Mohd Sadullah
Deputy Vice Chancellor (Academic & International)
Universiti Sains Malaysia

Welcome Message from Dean the School of Pharmaceutical Sciences Universiti Sains Malaysia



Professor Mohammad Nasih, Rector, Universitas Airlangga, Indonesia
Professor Junaidi Khotib, Dean, School of Pharmacy, Universitas Air Langga, Indonesia
Professor Dato' Dr Ahmad Farhan Mohd Saadullah Deputy Vice Chancellor (Academic & International) Universiti Sains Malaysia

Bismillahirrahmanirrahim

السَّلَامُ عَلَيْكُمْ وَرَحْمَةُ اللَّهِ وَبَرَكَاتُهُ

First of all, my praise to the Almighty that with his blessing we are able to gather today in International Conference of Pharmacy and Health Sciences 2020 and 3rd Joint Conference UNAIR-USM. On behalf of the organizing committee, I would like to welcome all distinguished speakers, guests and participants to this conference.

Ladies and Gentlemen,

I would like to take this opportunity to express my gratitude to Faculty of Pharmacy, Universitas Airlangga who opens up this opportunity for us to co-host this auspicious event. UNAIR – USM relationship in pharmaceutical sciences, goes back many years but it is not until 2007, we decided to take the relationship to the next level by organizing the first USM- UNAIR Joint Conference. There have been many exchanges and success achieved with this collaboration where we have successful research visits, joint supervision as well as joint publications. In 2008, we also embarked on an unprecedented

joint socio-educational community outreach programme with UNAIR for our undergraduate students. The programme or “Baktisiswa Mahasiswa USM-UNAIR 2008” were organized by the two universities and attended by about 40 students from USM, and about the same number from UNAIR. I was the Deputy Dean and in charge of the programme and interestingly, the UNAIR Faculty of Pharmacy Dean now was one of the persons in charge of the program. The program was highly successful and brought great impact for the community as well as the students involved.

The year 2020 has brought us again together. This is an interesting year indeed. The United Nations has declared 2020 as the International Year of Plant Health, and the World Health Organization designates it the Year of the Nurse and Midwife by. However, for most of us, 2020 will be remembered for COVID-19 pandemic. The pandemic has created unusual situations for all of us and which will become a new normal for the world. “Social distancing” has become a new buzz word and working from home has become a new trend in our academic culture. But as an academic, I feel, we are now even closer, especially, the technology is able to connect us through online learning, online meeting and today online conference where we will be exchanging the progress of our work, discoursing about the progress of knowledge, research and advances in the field of pharmaceutical and health sciences. For me, this is a new achievement for both universities and hopefully we will overcome the physical social distancing with new normal online social associating.

I have no doubts that with the commitment of all the organizing committee members, speakers and participants, this conference will be successful and enjoyable one. My gratitude and appreciations to all who have made this event possible and successful.

Thank you

Prof. Dr. Habibah A. Wahab
Dean, School of Pharmaceutical Sciences
Universiti Sains Malaysia

Welcome Message from Chairman of ICPHS 2020



Assalamualaykum warrahmatullahi wabarakatuh

Dear honourable speakers, and distinguished participants, ladies and gentlemen,

On behalf of ICHPS 2020 organizing committee, it is pleasures to welcome all of you to one day virtual conference, the 3rd Joint Conference UNAIR-USM, International Conference of Pharmacy and Health Science, 2020.

The conference that should be held virtually because of this global pandemic which worry us all, but not hindering us to meet and share our knowledge in this virtual conference. As someone once said “the show must go on”. Not that this is a show, but I appreciate your effort to be together virtually.

We are proud to announce that this conference is being conducted along with the cooperation of the Faculty of Pharmacy Universitas Airlangga and School of Pharmacy, Universiti Sains Malaysia. This is the third joint conference between Universitas Airlangga and University Sains Malaysia, after the last conference was held in 2009.

This conference will provide an opportunity for multidisciplinary participants, academics, researchers, industrial practitioners and students in the fields of pharmacy and other related health sciences to share their knowledge, experiences, and achievements of the latest research. There are 6 speakers from Indonesia, Malaysia, Thailand and Australia and about 429 participants, consisting 180 participants-only and 249 participant and poster presenters from Indonesia, Malaysia, Philippines, Nigeria, Canada, Australia, India, and Thailand will join in this conference. The Pre- Conference Workshop will also be attended by 55 participants for CADD workshop and 216 participants for HPTLC workshop.

Carrying the conference theme: "Research Acceleration in Pharmacy and Health Sciences through International Collaboration", it is hoped that the collaboration between Universitas Airlangga and USM will be even closer and bring a positive impact on the two institutions in the future.



3rd Joint Conference

INTERNATIONAL CONFERENCE OF
PHARMACY AND HEALTH SCIENCES 2020



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The organizing committee gratefully acknowledge the Rector of Universitas Airlangga, and Vice Chancellor of USM, as well as all sponsors in bringing forth this conference. Furthermore, I would like to express my deep appreciation to all members of the organizing committee, for the good team work and great efforts in making the conference successful.

To all of you, thank you for being here, welcome and enjoy the conference.

Dr. apt. Aty Widyawaruyanti, MSi.
Chairperson of ICPHS 2020

ORGANIZING COMMITTEE

INTERNATIONAL CONFERENCE OF PHARMACY AND HEALTH SCIENCE 2020 3rd JOINT CONFERENCE UNAIR-USM OCTOBER 27-28th, 2020

STEERING COMMITTEE	
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Pre-Conference Workshop

Computer-Aided Drug Design (CADD) RUNDOWN

3rd Joint UNAIR-USM Conference International Conference of Pharmacy and Health Sciences 2020

Tuesday, October 27th, 2020, 07.30-12.00 WIB (GMT+7), 08.30-13.00 MYT (GMT+8)

Time		Programme	Speaker/Moderator
WIB (GMT+7)	MYT (GMT+8)		
07.30	08.30	Registration	Nur Aizati Athirah Daud, BPharm, MPharm, PhD., Rph.
08.00	09.00	Opening	Dr. Siti Maisharah Sheikh Ghadzi, BPharm, MPharm, PhD., Rph.
08.05	09.05	Welcoming Speech from Universiti Sains Malaysia	Dr. Siti Maisharah Sheikh Ghadzi, BPharm, MPharm, PhD., Rph.
08.10	09.10	Welcoming Speech from Universitas Airlangga	Dr. apt. Aty Widyawaruyanti, M.S.
08.15	09.15	Workshop on Molecular Docking	Speaker : Prof. Dr Habibah binti A. Wahab Moderator : Dr. Siti Maisharah Sheikh Ghadzi, BPharm, MPharm, PhD., Rph.
09.15	10.15	Practical and Hands-on	Speaker : Dr. Ezatul Ezleen Kamarulzaman Moderator : Dr. Siti Maisharah Sheikh Ghadzi, BPharm, MPharm, PhD., Rph.
12.00	13.00	Closing	Dr. Siti Maisharah Sheikh Ghadzi, BPharm, MPharm, PhD., Rph.

Pre-Conference Workshop

HPTLC Fingerprinting as a Quality Control of Herbal Product RUNDOWN

3rd Joint UNAIR-USM Conference International Conference of Pharmacy and Health Sciences 2020

Tuesday, October 27th, 2020, 12.00-16.00 WIB (GMT+7), 13.00-17.00 MYT (GMT+8)

Time		Programme	Speaker/Moderator
WIB (GMT+7)	MYT (GMT+8)		
12.00-12.15	13.00-13.15	Registration and Opening	apt. Retno Widyowati, SSi., MPharm., PhD.
12.15-12.30	13.15-13.30	Opening Remark by Chairman from Universitas Airlangga	Dr. apt. Aty Widyawaruyanti, MS.
SESSION 1			
12.30-13.15	13.30-14.15	An Overview of HPTLC Instrumentation	apt. RR Anung Nugraheni, S. Farm.
		Q & A	apt. Retno Widyowati, SSi., MPharm., PhD.
SESSION 2			
13.15-14.15	14.15-15.15	Topic 1: Comprehensive HPTLC Fingerprint – A New Approach to Quality	Eike Reich, Ph. D
14.15-15.45	15.15-16.15	Topic 2: Topic 2: Methods Development and Application of TLC Profile for Quality Control of Herbal Product	Dr. apt. Idha Kusumawati, MSi.
		Q & A	apt. Retno Widyowati, SSi., MPharm., PhD.
15.45-16.00	16.45-17.00	Closing	apt. Retno Widyowati, SSi., MPharm., PhD.

CONFERENCE PROGRAMME

3rd Joint UNAIR-USM Conference International Conference of Pharmacy and Health Sciences 2020

Wednesday, October 28th, 2020, 07.30-17.25 WIB (GMT+7), 08.30-18.25 MYT (GMT+8)

WIB (GMT+ 7)	MYT (GMT+8)	Event
07.30-08.10	08.30-09.10	Registration
08.10-08.15	09.10-09.15	Traditional dance
08.15-08.20	09.15-09.20	Opening Remarks
08.20-08.25	09.20-09.25	Indonesia National Anthem
08.25-08.30	09.25-09.30	Malaysia National Anthem
08.30- 08.40	09.30-09.40	Welcome speech by Dean Faculty of Pharmacy Universitas Airlangga (Prof. apt. Junaidi Khotib, S.Si., M.Kes., Ph.D)
08.40- 08.50	09.40-09.50	Welcome speech by Dean School of Pharmaceutical Sciences Universiti Sains Malaysia (Prof. Dr. Habibah A. Wahab, FRSC)
08.50 -09.00	09.50-10.00	Welcome speech by Deputy Vice Chancellor (Academic and International) Universiti Sains Malaysia (Professor Dato' Dr Ahmad Farhan Mohd Sadullah)
09.00- 09.10	10.00-10.10	Welcome speech by Rector of Universitas Airlangga (Prof. Dr. Mohammad Nasih, SE., M.T., Ak., CMA)
SPEAKER SESSION 1		
09.15-09.45	10.15-10.45	Dra. apt. Rr. Mayagustina Andarini, MSc. (Natural Agency of Drug and Food Control of Republic Indonesia) "Traditional Medicine Regulation: Strategic Role of Indonesia-FDA in Supporting Traditional Medicine Development"
09.45-10.15	10.45-11.15	Prof. Dr.Habibah A Wahab (School of Pharmaceutical Sciences , University Science Malaysia, Malaysia) "Natural Products for Drug Discovery in the 21 st Century"
10.15-10.45	11.15-11.45	Assoc. Prof. Kornkanok Ingkaninan (Faculty of Pharmaceutical Science, Naresuan University, Thailand) "Hemp, a Promising Herb for Food, Drug and Cosmetic"
10.45-11.15	11.45-12.15	Discussion
11.25-12.55	12.25-13.55	POSTER PRESENTATION SESSION 1
12.55-13.25	13.55-14.25	Break Time

WIB (GMT+ 7)	MYT (GMT+8)	Event
SPEAKER SESSION 2		
13.25-14.55	14.25-15.55	POSTER PRESENTATION SESSION 2
15.00-15.40	16.00-16.40	Dr. Yiwei Wang (ANZAC Research Institute, Concord Clinical School, Australia) “Androgens and Sever Burn Injury”
15.40-16.10	16.40-17.10	Dr Fatimatuzzahra" Abd Aziz (School of Pharmaceutical Sciences USM, Malaysia) “An Insight on the Traditional and Complementary Medicine Practice and Education in Malaysia”
16.10-16.40	17.10-17.40	Prof. Dr. apt. Bambang Prajogo EW, M.S. (Faculty of Pharmacy Universitas Airlangga, Indonesia) “Indonesian Medicinal Plants for Clinical Studies (Needs, Expectations, Constraints and Risks)”
16.40-17.00	17.40-18.00	Discussion
17.00-17.10	18.00-18.10	Best Poster and Best Presentation Announcement
17.10-17.25	18.10-18.25	Closing

Abstracts of Invited Speakers

Speaker Session 1

Traditional Medicine Regulation: Strategic Role of Indonesia-FDA in Supporting Traditional Medicine Development

Dra. apt. Mayagustina Andarini, M.Sc
Natural Agency of Drug and Food Control of Republic Indonesia



Indonesia is the second biggest country in the world for its biodiversity and possessing high herbal natural resources. Many of these herbals are used in medicinal treatment. However, the safety and effectiveness has not yet supported by comprehensive research. It is regarded necessary to establish policy for national traditional medicines, to cover the sake of: Government, Researcher and Traditional Medicine (TM) Industries.

Indonesian Food and Drug Authority (BPOM), has encouraged the development and use of OMAI (Modern Indonesian Herbal Medicine). This TM category consist of Standardized Herbal Medicine (OHT) and Phytopharmaca (FF). Jamu has been developed to be produced by scientific approaches through pre-clinical tests, this product is defined as OHT and for those which have passed clinical tests defined as FF.

BPOM promotes the increase of OMAI, by providing assistance starting from the preparation of test protocol up to the implementation of both pre-clinical and clinical trials. BPOM also conducts downstream of herbal medicines to encourage researchers to conducts herbal medicine research for producing good OMAI products.

There are collaboration and cross-ministerial coordination through the task force to accelerate the development and utilization of FF, consists of 5 fields namely raw materials; manufacturing technology and standardization; preclinical and clinical trials; development of traditional health services; production and promotion of FF.

Currently, various efforts are being made to encourage Obat Modern Asli Indonesia (OMAI) to be included in to the JKN (National Health Insurances) National Formulary. JKN Formulary is a list of selected drugs needed and used as a reference for prescriptions in the health services covered by JKN. If OMAI is included in to the JKN National Formulary, demand from public for OMAI will be increased and therefore encouraging researcher/industry to conduct more herbal medicine research.

Therefore, the existing regulation have been established to assure the safety, efficacy and quality of TMs and some new regulation will be developed to facilitate the roadmap of TMs development and support OMAI to be accepted and used into public health services.

Abstracts of Invited Speakers

Speaker Session 1

Natural Products for Drug Discovery in the 21st Century

Habibah A. Wahab

School of Pharmaceutical Sciences, University Science Malaysia, Malaysia



Natural products have long been used as the source of medicines for the treatments of various diseases and ailments. However, their use has been in decline in the past two decades due to technical requirements in high throughput screening, difficulties associated with the repeated isolation of known compounds as well as the synthesis during pharmaceutical manufacture. However, these difficulties can partly be overcome by embracing latest technologies in drug discovery. One of the technologies is computer aided drug design that also include machine learning, knowledge based- and physic based molecular modelling. Machine learning implementation in QSAR as well as pharmacophore modelling will be briefly described together with molecular docking. The strategy of computer aided drug design, with successful examples (e.g. Docetaxel, galantamine), will be highlighted here to illustrate the efficiency of this technology in discovering active compounds from natural products. In addition, researches from our group on computer aided drug design from natural products will also be briefly presented.

Abstracts of Invited Speakers

Speaker Session 1

Hemp, a Promising Herb for Food, Drug and Cosmetic

Kornkanok Ingkaninan^{1,2*}

¹NU-CAN, Faculty of Pharmaceutical Sciences, Naresuan University, Phitsanulok 65000, Thailand

²Faculty of Pharmacy, Airlangga University, Surabaya 60286, Indonesia



Medical applications of *Cannabis sativa* L. or Cannabis has been in the spot light around the world. However, the concern on drug abuse is still high as *C.sativa* is psychoactive and in the list of narcotic drugs of many countries. Hemp, or industrial hemp, is a strain of the *C.sativa* plant species that is cultivated for the industrial uses of its fiber, shivs, seeds and other products. It can be developed into a variety of commercial products, including paper, textiles, biodegradable plastics, paint, insulation, biofuel, animal feed, food, food supplements, drugs and cosmetics. Hemp contain restricted concentration of the psychoactive component tetrahydrocannabinol (THC). The legality of hemp varies widely between countries. In Thailand, the concentration of THC in hemp is not more than 1%. USA legalized hemp that contains up to 0.3% THC while the E.U. maintains a cap of 0.2%.

Recently, The Food and Drug Administration (FDA) of Thailand has removed hemp extract containing not more than 0.2% of THC from the narcotic substance list and support a use of the extract for a herbal product ingredient. Hemp seed and oil derivatives are allowed as a food and food ingredient, as well as an ingredient for use in cosmetics. There is a significant interest in the development of therapies and other consumer products derived from hemp and its components, including cannabidiol (CBD). CBD is most commonly used for epilepsy. It has also shown potential as therapeutic agents in preclinical models of central nervous system diseases such as epilepsy, neurodegenerative diseases, schizophrenia, multiple sclerosis, and anorexia. CBD has been shown in in vitro and animal studies to possess, anti-anxiety, anti-nausea, anti-arthritis, anti-psychotic, anti-inflammatory, and immunomodulatory properties. In addition, CBD presents also strong anti-fungal and antibacterial properties. CBD isolated or hemp extract containing high CBD is, therefore, a promising ingredients in food supplement and health products. Hemp seed oil contains high level of polyunsaturated fatty acids. The omega-6 to omega-3 ratio in hemp seed oil is between 2:1 and 3:1, which is considered to have great benefit for human health. Recent clinical studies have indicated hempseed oil as promising functional food, animal feeding and cosmetic ingredients.

Keywords: Hemp, CBD, hemp seed oil

Abstracts of Invited Speakers

Speaker Session 2

Androgens and Severe Burn Injury

Yiwei Wang

ANZAC Research Institute, Concord Clinical School, Australia



Androgens inhibit cutaneous wound repair in both man and male mice. However, in children with severe burn injuries, a synthetic androgen was reported to maintain lean body mass, improves systemic hypermetabolic responses and shortens healing time. Therefore, in this study, the role of the pure androgen dihydrotestosterone (DHT) was comprehensively examined in complex major burn injury, in particular whether androgens target local healing processes, systemic burn-induced hypermetabolism or both. Following burn injury, DHT treatment accelerated wound healing in mice, but had no impact on burn-induced hypermetabolism. The control mice displayed acute systemic inflammatory responses with a significant increase in spleen weight, greater infiltration of nucleated erythroid cells in splenic red pulp, and a significant increase in splenic monocyte numbers. In comparison, DHT treatment shortened the systemic inflammatory cycle with reduced splenic weight and monocyte numbers.

Moreover, a novel electrospun polycaprolactone (PCL) scaffold was developed successfully with controlled release of DHT and anti-androgens, flutamide (F). In vitro drug delivery curve showed that both DHT and F can be released constantly. F scaffolds significantly promoted burn injury wound healing with enhanced collagen deposition. However, F scaffolds had no effects on re-epithelization or cell proliferation. Mice with DHT scaffolds showed similar wound healing compare to blank scaffolds. Additionally, mice with burn injury dressed with F scaffolds had a significant body weight loss, reduced food intake and lean mass loss when compare to the mice with DHT-PCL scaffolds.

Systemic treatment of DHT facilitates local wound healing by accelerating the inflammatory cycle, but not through any alterations to the post-burn hypermetabolic response or local healing mechanisms. However, local delivery of an anti- androgen impregnated in a scaffold promotes burn injury wound healing in mice.

Abstracts of Invited Speakers

Speaker Session 2

An Insight on the Traditional and Complementary Medicine Practice and Education in Malaysia

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Traditional and complementary medicine (T&CM) continues to be widely used in Asia, including Malaysia. It was first instituted under the Family Health Development Division back in 1996 and later transformed into a special unit since 2004. T&CM remains to be utilized by the community mainly to treat disease and to maintain well-being. It has been recognised as a treatment option that is available in the country. It will coexist with modern medicine and contribute towards enhancing the health and quality of life of all Malaysians. Traditional Malay medicine, traditional Chinese medicine, traditional Indian medicine, homeopathy, chiropractic, osteopathy and Islamic medical practice are among the T&CM recognised practice services which are available in the country. Several public hospitals have been identified as the treatment centre that supports the use of traditional and complementary treatments in their daily patient care. The T&CM blueprint was established by the Malaysian government as the way forward for the nation to ensure good management with the main objective to promote quality, safe practices and products of T&CM to optimise health outcomes and ensure value for money. The blueprint also will help in strengthening of the laws and regulations, creating a robust T&CM industry as well as developing the economy of the country. Four core components of the T&CM have been identified as the focus for continuous improvement; mainly the practice, education and training, raw materials and products and research. Strategies had been outlined at the national level until the year 2027 to ensure a sustainable approach are implemented to accomplish the mission and vision of T&CM progression

Abstracts of Invited Speakers

Speaker Session 2

Indonesian Medicinal Plants for Clinical Studies (Needs, Expectations, Constraints and Risks)

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Surabaya, Indonesia



Indonesia's terrestrial biodiversity is the second richest in the world after Brazil and is the first position if it includes marine biota wealth. The preservation of biodiversity, including microbial, plant, and animal provides a vital link to critically expand the molecular diversity necessary for successful drug discovery. Over the past few decades, researchers have focused on drug discovery from herbal medicines or botanical sources. In developed countries, they are used because they are natural and therefore assumed to be safer than allopathic medicines. In recent times, however, there has been a growing concern about their safety and need a strict rule to evaluate their quality, efficacy, and safety. A clinical trial involving subjects with clear indications and clear boundaries concerning human rights. The Indonesian National Agency for Drug and Food Control (Badan Pengawas Obat dan Makanan, Republik Indonesia- BPOM RI) classifies traditional medicine into three classes, namely Jamu (Indonesian indigenous traditional medicine), standardized herbal medicine and phytopharmaca. Phytopharmaca based on its scientific evidence, produced from standardized raw materials, manufactured based on GMP and required a clinical trial before penetrating to market. For conducting a clinical trial, the clinical test protocol must be approved by the regulator in this case BPOM. Looking at the requirements and conditions that must be followed, it is necessary to prepare carefully and a grand strategy of designing efforts to conduct a clinical trial of Indonesian traditional medicine.

3 Minutes Poster Presentation Schedule

International Conference of Pharmacy and Health Sciences 2020 October 28, 2020

Room 1 : Pharmacology and Biomedical Sciences	
Meeting ID	915 478 7409
Passcode	icphs1

Session 1: 11.25 – 12.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
BS-01	Aguslina Kirtishanti	Inhibition of Ras and STAT3 Activity of 4-(Tert-Butyl)-N-Carbamoylbenzamide As Antiproliferative Agent in HER2-expressing Breast Cancer Cells
BS-02	Debby Saputera	Toxicological Screening of Ellagic Acid and Bovine Bone Xenograft Combination as Stimulant Osteoblastogenesis on Bhk-21 Fibroblast Cells
BS-03	Devy Maulidya Cahyani	Animal Model of Liver Cancer in Mice Induced with N-Nitrosodiethylamine
BS-04	Herry Wibowo	The Effect of Sodium Diclofenac on Callus Formation in White Male Rat (<i>Rattus Norvegicus</i>) Cruris Fracture Healing
BS-06	I Nengah Budi Sumartha	Resveratrol ameliorates physical and psychological stress-induced depressive-like behavior
BS-07	Mahardian Rahmadi	The Effect of Various High-Fat Diet on Liver Histology in The Development of NAFLD Models in Mice
BS-08	Maria Apriliani Gani	Predicting the Molecular Mechanism of Glucosamine in Accelerating Bone Defect Repair By Stimulating Osteogenic Proteins
BS-09	Mohammed Ahmmed Akkaif	The role of Pharmacogenetics and Pharmacometabonomics in the personalization of Ticagrelor Antiplatelet Therapy
BS-10	Nily Su'aida	Gastroprotective effect of fluvoxamine and ondansetron on stress-induced gastric ulcers in mice
BS-11	Noorul Hamizah Mat	Mitragynine alleviates pain-like behaviour in pain animal model
BS-12	Nunuk Dyah Retno Lastuti	Molecular characterization of encoding gen of second internal transcribed spacer (ITS-2) of <i>Sarcoptes scabiei</i> in rabbits from several areas of East Java, Indonesia
BS-13	Prihartini Widiyanti	Osteoblast Iron Genes: Real Time PCR and Microarray Hybridization Approach Under Hyperoxia
BS-14	Purwo Sri Rejeki	A ketogenic diet prevents weight gain through blood ketone levels in mice
BS-16	Risa Zulfiana	Genetic Profile Mutation rpoB in Clinical Isolate of Rifampicin Resistant <i>Staphylococcus aureus</i>
NP-11	Aty Widyawaruyanti	<i>Cratogeomys sumatranus</i> subfractions exhibited antimalarial activity by Lactate Dehydrogenase (LDH) assay
NP-50	Retno Widyowati	The effect of ganitri (<i>Elaeocarpus serratus</i> L.) from Baung Forest on bone formation cell models

Room 1 : Pharmacology, Biomedical Sciences & Natural Product Drug Discovery

Meeting ID	915 478 7409
Passcode	icphs1

Session 2: 13.25 – 14.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
BS-05	Herry Wibowo	The Role of Chondroitin Sulphate to Bone Healing Indicators and Compressive Strength
BS-15	Purwo Sri Rejeki	Modulation of blood glucose levels can prevent weight gain of mice on ketogenic diet
BS-17	Salamun Salamun	Larvicidal toxicity and parasporal inclusion of native <i>Bacillus thuringiensis</i> BK5.2 against <i>Aedes aegypti</i> vector of Dengue Hemorrhagic Fever
BS-18	Tuhfatul Ulya	Quercetin promotes behavioral recovery and biomolecular changes of melanocortin-4 receptor in mice with ischemic stroke
BS-19	You Chiek Yi	Mitragynine improves cognitive performance in morphine-withdrawn rats
BS-20	Burhan Ma'arif	The Antineuroinflammatory Effect of Genistein in Microglia HMC3 Cell Line
BS-21	Mei Lan Tan	The effect of ketones bodies on human adipocytes in vitro, a preliminary implication on ketogenic diet
BS-22	Sagir Mustapha	Potential roles of endoplasmic reticulum stress and cellular proteins implicated in diabetes
NP-62	Vilya Syafriana	Antimicrobial activity of ethanol extract of Sempur leaves (<i>Dillenia suffruticosa</i> (Griff.) Martelli) against <i>Staphylococcus aureus</i> , <i>Escherichia coli</i> , and <i>Candida albicans</i>
NP-64	Yudi Purnomo	Effect of Pulutan (<i>Urena lobata</i>) Leaf Extract on Blood Glucose Level and Body Growth of Zebra Fish (<i>Danio rerio</i>) Exposed by Malathion
NP-65	Safiya Shehu Abdulkadir	In vivo antiplasmodial potentials of the leaf extract of <i>Piliostigma reticulatum</i> (DC.) Hochst (Fabaceae)
NP-67	Andhika Dwi Aristyawan	In Vitro Acetylcholinesterase Inhibitory Activities of Subfractions and Isolate from Ethyl Acetate Fraction of Marine Sponge <i>Agelas nakamurai</i>
NP-68	Ilham Bagus Sagitaras	Attenuation of Hyperplasia in Lung Parenchymal and Colonic Epithelial Cells in DMBA-Induced Cancer Model by Administering <i>Andrographis paniculata</i> Nees Extract
NP-70	Fitri Yuniarti	Isolation And The β -Galactosidase Enzyme Activity Test Of Lactic Acid Bacteria From Cabbage Fermentation (<i>Brassica Oleracea</i> L.)
NP-57	Suciati	Antioxidant activities of extracts from the leaves of <i>Cassia moschata</i> Kunth
NP-59	THAIGARAJAN PARUMASIVAM	Assessment of Anti-methicillin Resistant <i>Staphylococcus aureus</i> (MRSA) and Anti-Methicillin Susceptible <i>Staphylococcus aureus</i> (MSSA) Properties of Malaysian Medicinal Plants

Room 2 : Natural Product Drug Discovery	
Meeting ID	915 478 7409
Passcode	icphs1

Session 1: 11.25 – 12.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
NP-01	Abdulloh Machin	Green Tea with its active compound EGCG inhibit Neuronal Apoptosis in Middle Cerebral Artery Occlusion (MCAO) model
NP-02	ABU MD ASHIF IKBAL	Assessment of Phytochemical and Anthelmintic Activity of Some Selected Ethnomedicinal Plants from Barak Valley Region of Assam
NP-03	Ais Amalia Tsani	Transethosome gel of orange (<i>Citrus sinensis</i> L.) peel extract for atherosclerosis prevention by total cholesterol reduction
NP-04	Amira Rahana Abdullahi	Antiplasmodial activity of <i>Detarium microcarpum</i> Guill. & Perr. (Fabaceae) stem bark extract
NP-05	Ananda Firman Putranto	Effect of Combination Electrolyzed Reduce Water and EGCG (Epigallocatechin-3-Gallate) on RANKL Expression and Osteoclast Number in Orthodontic Teeth Relapse
NP-06	Andi Jayawardhana	Effects Of Honey As Body Defense From <i>Toxoplasma Gondii</i> Infection
NP-07	Angelica Kresnamurti	MDA Levels and Liver Histopathology Recovery After Per Oral Administration of <i>Echinometra Mathaei</i> Ethanol Extract on Wistar Rats Induced By Paracetamol
NP-08	Dwitiyanti	Pharmacokinetic Interaction of Binahong (<i>Anredera cordifolia</i> (Ten.) Steenis) leaves extract and Glibenclamide in Rat
NP-10	APRELITA NURELLI DWIANA	Potency ratio of fermentation filtrate of yellow passion (<i>Passiflora edulis</i> var. <i>Flavicarpa</i>) fruit pulp to antibiotics standard against <i>Staphylococcus aureus</i> , <i>Escherichia coli</i> and <i>Bacillus subtilis</i> .
NP-12	balgis al basyarahil	Review Plant Extract <i>Elephantopus Scaber</i> Linn and probiotic of natural feed additives as alternative to an Antibiotic Growth Promotes (AGP) In Broiler diets.
NP-13	Damaranie Dipahayu	Antioxidant activity, phenolic and flavonoid contents in the leaves extract of purple sweet potatoes (<i>Ipomoea batatas</i> (L.)) Antin-3 variety in different ethanol concentration as a solvent
NP-14	Debora Poerwantoro	Acetylcholinesterase Inhibitory Activity of Extract and Fractions from Root of <i>Rauvolfia serpentina</i> (L.) Bth.ex Kurz
NP-15	Denny Satria	The Activity of Combination Virgin Coconut Oil and Ethanol Extract of <i>Artocarpus lacucha</i> Buch.-Ham. Leaves to Increase Proliferation On NIH 3T3 Cell Line
NP-16	Deny Saputra	The Effect Of Mangosteen Pericarp (<i>Garcinia mangostana</i> L.) Extract Mucoadhesive Gingival Patch on The MDA Levels And The Number of Micronuclei Due to Panoramic Radiography Radiation
NP-60	Tutik S Wahyuni	Antiviral activities of <i>Acacia mangium</i> leave against hepatitis C virus

Room 2 : Natural Product Drug Discovery	
Meeting ID	915 478 7409
Passcode	icphs1

Session 2: 13.25 – 14.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
NP-09	Elly Wardani	Effects of Kemuning ((<i>Murraya paniculata</i> L.) Leaves Extract on the Pharmacokinetic of Simvastatin in Rat
NP-17	Devi Novia	The effect of Tamarind Leaf (<i>tamarindus indica</i> linn) Extract on Insulin Levels and Homa-IR in Rats With Type 2 Diabetic Model
NP-18	Dian Suasana	The Effects of Quercetin on Nicotine-induced Reward effects in Mice
NP-19	Dini Sri Damayanti	Potensial Active Compounds of Soursop Leaves (<i>Annona muricata</i>) to Prevent SARS-CoV2 Infection
NP-20	Djelang Zainuddin Fickri	Comparison of blood pressure reduction between treatments of steeping Red Ginger Rhizome (<i>Zingiber officinale</i> R.) and steeping Binahong Leaves (<i>Anredera cordifolia</i> (Ten.) Steenis) in Healthy People with hypertension risk
NP-21	Yuliet -	Effect of ethanol extract and active fraction of <i>Hibiscus surattensis</i> L. leaves on blood glucose levels and histology of liver diabetic mice
NP-22	Ermina Pakki	Proximate Composition and Antioxidant Activity of Leaf of <i>Moringa oleifera</i>
NP-23	Eva Melisa Damayanti	The Potency of Flavonoids (Quercetin, Rutin, And Myricetin) from <i>Elaeocarpus serratus</i> L. Leaves as Antiosteoporosis A Literature Review
NP-24	Fahrauk Faramayuda	Effect of Gamborg media on the phytochemical profile of callus <i>Orthosiphon aristatus</i> purple and white-purple varieties: the first step in the production of natural drug products
NP-25	Hafiz Ramadhan	Phenol-flavonoid contents and antioxidant activity of ethyl acetate fraction and aqueous fraction of Binjai (<i>Mangifera caesia</i> Jack. Ex. Wall) leaves methanol extract from South Kalimantan
NP-26	Idin Sahidin	Antibacterial and Toxicity Properties of Prospective Compounds from <i>Meistera chinensis</i> (Zingiberaceae) Fruits Growing in Southeast Sulawesi
NP-27	Iif Hanifa Nurrosyidah	Optimization of Fermentation Condition on <i>Passiflora edulis</i> Sims. Fruit in De Men Rogosa Sharpe (MRS) Media and Its Activity Againsts <i>Escherichia coli</i> Extended Spectrum β -Lactamase (ESBL) and Methicillin Resistant <i>Staphylococcus aureus</i> (MRSA)
NP-28	Ika Puspita Dewi	The hepatoprotective effect of sugarcane (<i>Saccharum officinarum</i> Linn.) leaves ethanolic extract on CCl ₄ -induced damages in rats
NP-29	Jamal Nasser Saleh Al-maamari	Effect of Quercetin on the Expression of SRBP-1c mRNA in High Fat Diet-Induced NAFLD in Mice
NP-63	Wiwied Ekasari	Elicitor Treatments Increase In vitro Antiplasmodial Activity of <i>Sonchus arvensis</i> L. Callus

Room 3 : Natural Product Drug Discovery	
Meeting ID	915 478 7409
Passcode	icphs1

Session 1: 11.25 – 12.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
NP-30	Junairiah -	Bioactive Compounds on Ethanol and Chloroform Extracts of <i>Piper sarmentosum</i> Roxb
NP-31	Kartika Dyah Palupi	Endophytic fungi inhabiting <i>Physalis angulata</i> plant: diversity, antioxidant, and antimicrobial activity of their ethyl acetate extracts
NP-32	Khoirun Nisyak	The Effect of Incubation Time on Biotransformation of Gurjun Balsam Oil by <i>Aspergillus niger</i>
NP-33	Kholidah Febriani	Utilization of domestic waste shallot skins as a source of pharmacy active ingredients
NP-34	Lidya Tumewu	<i>Artocarpus champeden</i> stem bark contains antimalarial substances against <i>Plasmodium falciparum</i>
NP-35	Luke Wongso	The effect of curcumin and quercetin on allodynia response in oxaliplatin-induced peripheral neuropathy pain
NP-36	Lukman Lukman	Andrographolide, a New Hope in the Prevention and Treatment of Diabetic
NP-37	Luthfiatu Kanina	Acute and Subchronic Toxicity Assessment of 70% Ethanol Extract of Leaves of <i>Gendarusa</i> (<i>Justicia gendarussa</i> Burm. f.) in vivo
NP-38	Manu Singhai	Topical Herbal Bigel for the Treatment of Psoriasis
NP-39	Marsih Wijayanti	In vitro antimalarial activity of <i>Garcinia parvifolia</i> Miq. stem extracts and fractions on <i>Plasmodium falciparum</i> lactate dehydrogenase (LDH) assay
NP-40	Muhammad Ilyas Yusuf	IMMUNOMODULATORY POTENTIALS of <i>Etingera rubroloba</i> A.D. Poulsen AGAINST CD4 LEVELS IN WISTAR MALE RATS
NP-41	Muhammad Luthfi	<i>Centella asiatica</i> Extract as a Resolution of Inflammation In Severe Early Childhood Caries
NP-42	Muhammad Sulaiman Zubair	Antioxidant and Antiviral Potency of <i>Benalu Batu</i> (<i>Begonia medicinalis</i>)
NP-43	Mukesh Singh Chhawari	Phytochemical Screening, TLC and Antioxidant Activity of Aerial Part of <i>Phyllanthus niruri</i>
NP-66	Rice Disi Oktarina	Adenosine receptor inhibitor activity (sub-type A1 and A2A) of <i>Fraxinus griffithii</i> Clarke stem bark

Room 3 : Natural Product Drug Discovery	
Meeting ID	915 478 7409
Passcode	icphs1

Session 2: 13.25 – 14.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
NP-44	Netty Suharti	The Study of Imunebooster Effect of Ethanol Extract of Mychorrizae Arbuscular Induced Ginger Rhizome (<i>Zingiber officinale</i> Rosce.)
NP-45	Norliana Ghazali	Anti-inflammatory effect of <i>Ixora coccinea</i> Linn on Stem Cells of human exfoliated teeth (SHED) cells
NP-46	Nur Irhamni Sabrina	Review: Study of Standardized Herbal Drug Preparations of <i>Justicia gendarussa</i> Burm.f. leaf as Male Contraceptive
NP-47	Nur Najihah Ismail	<i>Averrhoa bilimbi</i> : A Potential Phytomedicine For the Treatment of Tuberculosis
NP-48	Ramidha Syaharani	The effect of <i>Camellia sinensis</i> (Green tea) with its active compound EGCG on neuronal cell necroptosis in <i>Rattus norvegicus</i> Middle Cerebral Artery Occlusion (MCAO) model
NP-49	Renny Novi Puspitasari	Total flavonoid and polyphenol content of <i>Tinospora crispa</i> cultivated at highland region
NP-51	Rini Hamsidi	Quality Control Standardization of <i>Carthamus Tinctorius</i> L. Flowers Ethanol Extract
NP-52	Rokhmatul Ummah	Quality Control Study of Crude Drug of <i>Justicia Gendarussa</i> Burm. F. Leaf as Male Contraceptive
NP-53	Saipul Maulana	Review: Study of Utilization Prospect of <i>Gendarusa</i> (<i>Justicia gendarussa</i> Burm. f.) as anti HIV/AIDS Agent
NP-54	Siti Mudaliana	Antimicrobial activity of <i>Centella asiatica</i> and <i>Gigantochloa apus</i> : a nutraceutical study
NP-55	SITI QAMARIYAH KHAIRUNISA	Screening of Anti-HIV Activities in Ethanol Extract, Chloroform, Ethyl Acetate, and Buthanol Fractions from <i>Ficus fistulosa</i>
NP-56	Farjana Yasmin	Antioxidant activities of different types of vinegars
NP-58	Teodhora Teodhora	Antipyretic Potential of Maja in Fever Induced Male Mice by DPT (Difteri, Pertusis, Tetanus) Vaccine
NP-61	uswatun khasanah	Antibacterial activity of extract and fractions of <i>Mimosa pudica</i> leaves against MRSA and ESBL producing <i>Escherichia coli</i>
NP-69	Neny Purwitasari	Neuraminidase activity of 96% ethanol extract of <i>Vitex pinnata</i> L. leaves

Room 4 : Clinical and Community Pharmacy	
Meeting ID	923 8312 1037
Passcode	icphs2

Session 1: 11.25 – 12.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
CP-01	Abubakar Sha'aban	Drug-Related Emergency Department Visits at Healthcare Facilities in Saudi Arabia: A Review of The Literature
CP-03	Agni Kartika Prabansari	Knowledge, Attitude, and Practice of Medicine Disposal Among Community Pharmacists in Surabaya
CP-04	Ahmad Mazlan Nadiatul Azra	Community pharmacy services in Kota Bharu, Kelantan: From public perspectives
CP-05	Ahmad Rashidi Mohamed Tahir	Humanitarian Aid Involvement Factors Among IMARET volunteers
CP-06	Ahmad Yudianto	The Use of Artificial Intelligence in New Normal Era Against Pandemic COVID-19 in the Field of Health Services
CP-11	Athaya Bella Azzahrya	Knowledge, Attitude and Practice of Antibiotics Disposal Among Household in Surabaya
CP-12	Ayu Wulan Dwiputri	The Effect of Intermediate Medication Review on Lifestyle Changes and Clinical Outcome in Patients with Diabetes
CP-18	Desak Ketut Ernawati	Knowledge and attitudes of healthcare professionals on prescribing errors.
CP-22	Edlia Fadilah Mumtazah	Diabetes Mellitus Type 2 Screening in Hypertensive Patients at Primary Health Care Centers in Surabaya
CP-23	Elida Zairina	The correlation between self-related adherence, asthma-related quality of life and asthma control in adult patients
CP-24	Embun Suci Nasution	Evaluation of Antibiotics Utilization on Pediatric Inpatients in H. Adam Malik Hospital Medan
CP-29	Favian Rafif Firdaus	Knowledge, Attitudes and Practices Regarding Disposal of Unwanted Medications Among Housewives in Surabaya
CP-33	Gusti Nooriizka Veronika Achmad	Translation and Validation of the Indonesian Version AQL-4D Questionnaire to Measure the Quality of Life of Patients with Chronic Diseases
CP-45	Julaeha	Drug utilization of antipsychotics: a 1-year cross sectional study at the national mental hospital in Indonesia
CP-13	Arina Dery Puspita Sari	Study of Community Knowledge and Attitude in Recognizing Asthma Symptoms and Using Medicines When Facing Asthma Attacks: A Cross-Sectional Study

Room 4 : Clinical and Community Pharmacy	
Meeting ID	923 8312 1037
Passcode	icphs2

Session 2: 13.25 – 14.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
CP-02	Abubakar Sha'aban	Assessment of information overload of COVID-19 in the general public
CP-19	Desak Ketut Ernawati	A Reliability and Validity of Intercultural Sensitivity Scale (ISS) amongst Healthcare professionals in Indonesia
CP-34	Gusti Nooriizka Veronika Achmad	Adherence to pharmacological therapy and non-pharmacological therapy in hypertensive patients
CP-35	Hanni Prihastuti Puspitasari	Challenges in the provision of natural products by community pharmacists in East Java Province, Indonesia
CP-36	Hasna Qatrunnada	Drug utilization study and cost analysis of adult β -thalassemia mayor patient therapy at dr. soetomo general hospital surabaya
CP-38	Ibrahim Jatau Abubakar	Understanding adverse drug-related emergency department visits: development of a conceptual model through a systematic review
CP-39	Ilma Arista	Profile of Knowledge, Attitude, and Practice Disposal of Wasted Medications by Caregiver in Nursing Homes in Surabaya
CP-42	Jay Permejo Jazul	Assessment of patient understanding of their conventional cardiac medicines and herbal prepared/derived products: interviews with selected community dwelling elderly patients in the Philippines
CP-43	Jesslyn Patricia	Impact of Empirical Antibiotics' Appropriate Use on Patients' Outcome Therapy Among UTI Patients at The Inpatient Ward UGM Academic Hospital
CP-44	Jing Ng	Perceived depressive symptoms: prevalence and association with new york heart association classes of heart failure outpatients in a public hospital in Malaysia
CP-46	Julaeha	Translation and cross-cultural adaptation of an instrument measuring patient's well-being under treatment for schizophrenia
CP-47	Khusnul Khotimah	The relationship between frequency and preference of coffee type consumption on adults depression level
CP-48	Lalu Jupriadi Jupriadi	Adherence to taking asthma therapy prescription drugs in outpatients at Praya Healthcare Center, Central Lombok Regency, Indonesia
CP-51	Mahacita Andanalusia	The Effect of Education and Pillbox by Pharmacist towards Medication Adherence in Diabetes Mellitus Patient in A Primary Health Care Center in Mataram
CP-102	Anila Impian S	Understanding the characteristics of pharmacy and workforce in community pharmacy: an insight for practice change
CP-110	Anila Impian S	The potential role of pharmacist in counteracting health misinformation in social media

Room 5 : Clinical and Community Pharmacy	
Meeting ID	923 8312 1037
Passcode	icphs2

Session 1: 11.25 – 12.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
CP-07	Alifia Risma Fahmi	PROFILE OF gyrA GENE MUTATION IN CLINICAL ISOLATE OF LEVOFLOXACIN RESISTANT Escherichia coli
CP-08	Anisyah Achmad	The Maximum Dose and Duration in The Therapy Single Use Methotrexate to Achieve Remission by Rheumatoid Arthritis Patients Through Disease Activity Score 28
CP-09	anita purnamayanti	Renal and Cardiovascular Safety Profile of Remdesivir in Severe Covid- 19 – From Computational Studies to Clinical Applications
CP-14	Bindaria Mutmaina Prabawati	Levothyroxine on Hypothyroidism Following Adenoma of Pituitary: a Case Reports
CP-15	Claudia Tiffany	Hydration Effect On Kidney Function & Serum Electrolyte in Children with Tumor Lysis Syndrome (TLS) And Risk of TLS
CP-16	Daniel Dwi Christiananta Salean	STUDY OF ANTICOAGULANT IN PATIENT WITH CORONARY ARTERY DISEASE AT BHAYANGKARA HOSPITAL SURABAYA
CP-17	Denny Ardianto	ANALYSIS OF THE SIDE EFFECT OF QT INTERVAL PROLONGATION IN THE BEDAQUILIN REGIMEN IN DR-TB PATIENTS
CP-20	Devyana Dyah Wulandari	Chronic Exposure of Pesticide on Aspartate aminotransferase (AST), Alanin transferase (ALT), and Cholinesterase Enzyme (chE) in Farmers
CP-21	Dinda Monika Nusantara Ratri	Gender differences in blood glucose type 2 diabetes patients with combination rapid and long acting insulin therapy
CP-25	Erni Anika Sari	Monitoring Serum Creatinine, Blood Urea Nitrogen In Patients Brain Injury With Mannitol Therapy
CP-26	Fahmi Dimas Abdul Azis	EARLY DETECTION OF ELEVATED LIVER FUNCTION TEST IN TB DRUG RESISTANT WITH SHORT TERM THERAPY AND INDIVIDUAL THERAPY (The research was carried out at MDR TB Outpatient Clinic at Dr. Soetomo Hospital Surabaya)
CP-28	Farida Aulia	Drug-related problems of antibiotic use in gastroenteritis related to patient therapy outcome at universitas gadjah mada hospital
CP-30	Fitri Amalia Siswanto	EFFECTIVENESS OF CITICOLINE IN PEDIATRIC PATIENTS WITH REFRACTIVE AMBLYOPIA (Study Conducted at Surabaya Eye Clinic)
CP-66	Nur Khadijah Muhamad Jamil	Effect of mixed opioid and ATS dependent towards dopamine receptor in peripheral blood lymphocytes expression

Room 5 : Clinical and Community Pharmacy	
Meeting ID	923 8312 1037
Passcode	icphs2

Session 2: 13.25 – 14.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
CP-10	Anita Purnamayanti	Developing Pharmacokinetics – Pharmacodynamics Model of Valproic Acid Syrup Based on Prediction of Population Pharmacokinetics Parameters and Seizure Frequency in Indonesian Pediatric Epilepsy Outpatients
CP-27	Fahmi Dimas Abdul Azis	Management Analysis Side Effects Of Elevated Liver Function Test In Tb Drug Resistant With Short Term Therapy And Individual Therapy (The research was carried out at MDR TB Outpatient Clinic at Dr. Soetomo Hospital Surabaya)
CP-31	Fivy Kurniawati	Appropriate Empirical Antibiotic Treatment and Vital Sign Outcome among Pneumonia Patients in Universitas Gadjah Mada Academic Hospital, Indonesia
CP-37	Husnul Khatimah	The Correlation of Iodine Intake with Thyroid Stimulating Hormone (TSH) Level and Free Thyroxine (FT4) on Hyperthyroid Patients
CP-40	Ira Purbosari	Analysis of matrix Metalloproteinase-9 Levels in Patient of Acute Heart Failure with ACE Inhibitors Therapy (Study at RSUD Dr.Soetomo Surabaya)
CP-41	Irma Novrianti	Analysis Of The Effectiveness/Successfull And Safety Of Fibrinolytic Therapy In Patient With Acute Stemi (St-Segment Elevation Myocardial Infarction) (Study at RSUD Tarakan North Kalimantan)
CP-53	Marizki Pondawinata,	Effect of atorvastatin on CETP (Cholesteryl Ester Transfer Protein) level and lipid profiles in children refractory nephrotic syndrome with hyperlipidemia
CP-62	Ni Putu Wiliantari	Study of Chloroquine and Hydroxychloroquine for Therapy COVID-19 (Literature Review)
CP-63	Niswah Nilam Qonita	A Case Report: Effect of Hydrocortisone on Hypocortisolism Caused by Pituitary Adenoma
CP-64	Novan Yusuf Pratama	Hematological Side Effects Analysis Of Linezolid In Mdr-Tb Patients With Individual Therapy (The research was carried out at MDR TB Outpatient Clinic at Dr. Soetomo Hospital Surabaya)
CP-65	Novi Anggraeni	The Impact of Combination Therapy Utilizing Citrus limon Aromatherapy and Mozart Classical Music Distraction Therapy to Reduce The Pain Intensity in Post-Sectio Caesarea Mothers
CP-67	Nur Khadijah Muhamad Jamil	Effect of mixed amphetamine type stimulant and opioid dependent towards dopamine receptor in peripheral blood lymphocytes expression
CP-68	Nurul damayanti	Effect of Atorvastatin on LPL (Lipoprotein Lipase) and Lipid Profile in Children Nephrotic Syndrome Refracter with Hyperlipidemia
CP-69	Prihartini Widiyanti	The Role of Hyperbaric Oxygen to Platelet Aggregation in Non-Insulin-Dependent Diabetes Mellitus (NIDDM)

Room 6: Clinical and Community Pharmacy	
Meeting ID	923 8312 1037
Passcode	icphs2

Session 1: 11.25 – 12.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
CP-32	Garba Mohammed Khalid	Abuse of drugs and psychoactive substances amongst undergraduate university students
CP-49	Latifah Binti Zainudin	The effectiveness of beta blocker in geriatric with heart failure patients.
CP-50	Lisa Narulita Lisa Narulita	Analysis of the Use of Antibiotics Profile and Factors of Surgical Site Infections Study on Digestive and Oncology Surgery
CP-52	Maria Caecilia Nanny Setiawati	Evaluation of Antibiotic use in pneumonia treatment of pediatric and geriatric inpatients in Sultan Agung Islamic Hospital Semarang
CP-54	Mohammed Mustapha	Impact of adherence to key performance indicators on functional outcome in acute ischemic stroke care
CP-55	Moseed Mohammed	Using Ontology as a Decision Support System for Pharmaceuticals Product Sustainability
CP-56	Mridul Pokhrel	<u>Current Status and Future Prospects of Complementary and Alternative Medicines in India</u>
CP-57	Mufarrihah	The translation, validity test, and reliability test on CDC-HRQoL 4 for hypertension and tuberculosis patients
CP-58	Muhammad Fajar Rizqi	Adverse Drug Reactions and Its Management in Multidrug Resistant Tuberculosis Patients
CP-59	Muhammad Khalid Rijaluddin	What should I do? Factors Influencing The Performance Of Community Pharmacist
CP-78	Shah faisal	Knowledge, attitudes, and practices towards COVID-19 among university students in Pakistan. An online cross-sectional study
CP-94	Yunita Nita	Factors that influence adverse drug reactions reporting practices by healthcare professionals in Surabaya
CP-97	Abdul Rahem	Role of pharmacist in providing drug information and education for patients with chronic diseases during transition of care
CP-100	Andi Hermansyah	The nature and prevalence of prescription dispensing services in the developing world: evidence from the nationwide community pharmacy survey
CP-106	Nur Hafzan Md Hanafiah	Knowledge and Perception Among Pharmacists Towards Human Immunodeficiency Virus (Hiv) Pre-Exposure Prophylaxis (Prep) in A Public Hospital in Malaysia
CP-104	Nur Aizati Athirah Daud	Sleep quality and quality of life of Malaysian pharmacy undergraduate students

Room 6 : Clinical and Community Pharmacy	
Meeting ID	923 8312 1037
Passcode	icphs2

Session 2: 13.25 – 14.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
CP-60	Nadhifa Razani Aksan Putri	Knowledge and Attitude of Drug Take-Back Program Among Pharmacy Visitors in Surabaya
CP-61	Ngah Kuan Chow	Health-related quality of life and its association with sociodemographic, economic, and health status among HIV positive patients on efavirenz in northern Malaysia
CP-71	Rahmiyati Daud	Providing Counseling Through Home Pharmacy Care (HPC) for Hemodialysis Patients with Hypertension in Lowering Blood Pressure
CP-81	Siew Chin Ong	Attitude, practice, knowledge and reasons of use among traditional and complementary medicine users in Malaysia
CP-90	Yeoh Ee Theng	An evaluation on perception, knowledge and practices about the use of paracetamol among parents in treating their children: a study from Penang, Malaysia
CP-92	Yerlita El Gihart	Screening for type 2 diabetes mellitus in visitors of primary health care centers in Surabaya with BMI score above normal
CP-93	Yohana Febriani Putri Peu Patty	Cost of illness of diabetes mellitus in Indonesia: A systematic review
CP-95	Yunita Nita	Cost of Illness Study of Type 2 Diabetes Mellitus in Indonesia
CP-96	Nadhifah Dhia Zahrah	Risk Factors Affecting The Incidence Of Computer Vision Syndrome (CVS) In High School Students (Study at SMAN 2 and SMA Muhammadiyah 3 Jember, East Java, Indonesia)
CP-99	Titik Puji Rahayu	Exploring pharmacist experience and acceptance for debunking health misinformation in the social media: results of a small survey and focus group approach
CP-101	Andi Hermansyah	The remuneration of community pharmacist in the setting of Low- and Middle-Income Country
CP-103	Abdul Rahem	The impact of pharmacist shortage on the inventory management of medicines in Primary Healthcare Centers
CP-105	Tinagaran Karunakaran	Evaluation of vaccination knowledge and perception among pharmacy undergraduates in a public university in Malaysia: A cross-sectional study
CP-109	Rodhiyatul Fithri	The development and validation of the Health Belief Model questionnaire for measuring factors affecting adherence in the elderly with hypertension

Room 7 : Clinical and Community Pharmacy	
Meeting ID	963 4016 6125
Passcode	icphs3

Session 1: 11.25 – 12.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
CP-70	Putri Irsalina	Effectiveness of phenytoin as monotherapy treatment in high care unit
CP-72	Ratri Rokhani	Analysis of Prophylactic Antibiotics Use and Risk Factor of Postoperative Nosocomial Infection in Urological Surgery Patients
CP-73	Ria Etikasari	Health Related Quality of Life among Postmenopausal Woman with Hormone Responsive HER2- Breast Cancer in Indonesia
CP-74	Riza Alfian	Social media health interventions to improve diabetes mellitus patient outcome: a systematic review
CP-75	Rr. Rizky Liestya Wardani	Antibiotic use on acute respiratory tract infection non pneumonia and non specific diarrhea in Primary Health Centre in Banjarbaru City, South Kalimantan, Indonesia
CP-76	Safina Nur Azizah	The Impact of Suitability of Empirical Antibiotics Use on Therapeutic Outcome for Respiratory Tract Infection Patients at Inpatient Ward UGM Academic Hospital
CP-77	Setyo Utami	Signal Detection of Adverse Drug Reaction to First Line Anti Tuberculosis Drugs Using Indonesia Pharmacovigilance Database
CP-79	Shinta Mayasari	Analysis of the use a combination of metformin and glibenclamide drugs with blood glucose levels at diabetes mellitus patients.
CP-82	Sura Fouad Alsaffar	FKBP5 polymorphism association with asthma susceptibility in asthmatic patients
CP-83	Syefi Nuraeni Fitriana	Comparison of Kanamycin and Capreomycin-Induced Hypokalemia in Multidrug-Resistant Tuberculosis Patients Treatment at Dr. Soetomo General Hospital
CP-84	Sylvia Anggraeni	Role of Centella asiatica and ceramide in skin barrier improvement: a double blind clinical trial of Indonesian batik workers
CP-85	Tri Murti Andayani	Comparison and validation of EuroQol-5 Dimension-5 Level and Short Form-6 dimension in cataract patients
CP-86	Utami Harjantini	Correlation of Dietary Iron Intake and Serum Iron with Thyroid Stimulating Hormone (TSH) and Free Thyroxine (FT4) Levels in Adult Hyperthyroid Patients
CP-87	Wardah Zuhan Nafikhah	Drug Utilization Study of Lopinavir And Ritonavir in Covid-19 Patients (Literature Review)

Room 7 : Clinical and Community Pharmacy, Pharmaceutical Chemistry	
Meeting ID	963 4016 6125
Passcode	icphs3

Session 2: 13.25 – 14.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
CP-80	Shinta Mayasari	The effect of medication reconciliation of antihypertension drugs on admission to medication errors in hypertension patients.
CP-88	Widya Handayani	Analysis Of Hmgb-1 Level Before and After Providing Atorvastatin Standard Therapy in Coronary Artery Disease Patients with Diabetes Mellitus Type-2 Compared to Without Diabetes Mellitus Type-2
CP-89	YAE TYUG YAP	Therapeutic Drug Monitoring In Predicting Methotrexate-Induced Adverse Reactions In Patients With Rheumatoid Arthritis – Indicated Or Not?
CP-91	Yerlina Yerlina	Hydroxychloroquine for treatment of COVID-19
CP-98	Marwa Elsaheed Elhefnawy	A Review On The Possible Factors Affecting Hyperglycemia Management During Acute Ischemic Stroke
CP-107	Ririn Sutanti	Study of dysglycemia effect in hospitalized diabetes melitus patients using injection of ciprofloxacin or levofloxacin with oral antidiabetic or insulin
CP-108	Dhani Wijaya	Analysis of Gastric Ulcer Drug Regimentation In Surgical Patients
PC-08	Devi Rianti	The enhancement of bone defect healing by the application of hydroxyapatite extracted from Indonesian limestone
PC-12	Ira Rum	Development of PCR Method to Detect the mecA gene in Staphylococcus aureus bacteria
PC-17	Soni Muhsinin	Detection of Zein Gene of Corn (Zea Mays) As Another Material In Arabica Coffee Powder (Coffea Arabica) with Gel-Based Pcr Method
PC-18	Victoria Yulita Fitriani	Probiotic characteristics of lactic acid bacteria fermented from food origin
PT-01	Aseem Setia	Recent advancement of dendrimers in different cancer research with special reference to its patent
PT-37	Samirah	Local application of bisphosphonate cross-linked by glutaraldehyde on bovine hydroxyapatite - gelatin composite scaffold
PC-24	Andang Miatmoko	Liposomal formulation prepared with different types of phospholipids for delivery of doxorubicin

Room 8 : Pharmaceutical Chemistry	
Meeting ID	963 4016 6125
Passcode	icphs3

Session 1: 11.25 – 12.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
PC-03	Adinda Adelia Wulandari	Thymoquinone and its derivatives against breast cancer with HER2 positive: in silico studies of ADMET, docking and QSAR
PC-04	AGNIS PONDINEKA RIA ADITAMA	In vitro and in silico analysis on the bone formation activity of n-hexane fraction of semanggi (<i>Marsilea crenata</i> Presl.)
PC-05	Ahmad Dzulfikri Nurhan	Molecular Docking Studies of <i>Nigella sativa</i> and <i>Curcuma xanthorrhiza</i> Secondary Metabolites Against Histamine N-Methyltransferase with their ADMET Prediction
PC-06	Amina Jega Yusuf	In Silico Molecular Docking and ADMET analysis of compounds isolated from <i>Neocarya macrophylla</i> against three targets of SARS CoV-2 coronavirus
PC-10	Hilwa Fitri Hilwa Fitri	In Silico Study of Antiosteoporosis Effect of Compounds from <i>Chrysophyllum cainito</i> L. Leaves Against 3OLS Protein
PC-11	Honey Dzikri Marhaeny	Phyllanthin and Hypophyllanthin, the Isolated Compounds of <i>Phyllanthus niruri</i> inhibit protein receptor of Corona Virus (COVID-19) through in Silico Approach
PC-13	Kholis Amalia Nofianti	Betulinic acid derivatives as anti-HIV drug candidates: in silico evaluation of their physicochemical and pharmacokinetic profiles (ADMET)
PC-14	Melanny Ika Sulistyowaty	Synthesis, ADMET Predictions, Molecular Docking Studies, and in-vitro Anticancer Activity of Some Benzoxazines against A549 Human Lung Cancer Cells
PC-19	Yoni Rina Bintari	In Silico Screening of Potential Essential Oil of <i>Mentha piperita</i> and <i>Cymbopogon citratus</i> Against Covid-19 by Targeting Angiotensin-Converting Enzyme 2 (ACE2) and Aminopeptidase (APN): Molecular Docking Approach
PC-20	Yudi Purnomo	Inhibitory activity of <i>Urena lobata</i> leaf extract on alpha-amylase and alpha-glucosidase: in vitro and in silico approach
PC-21	Yusuf Oloruntoyin Ayipo	Identification of novel 5-HT _{1A} antagonists and reuptake inhibitors via homology modelling, docking screening and molecular dynamics simulation
PC-25	Nuzul Wahyuning Diyah	Design derivatives of gossypetin, a naturally occurring flavonoid in <i>Hibiscus sabdariffa</i> , and molecular docking as antibacterial agents
PC-26	Ahmad Ghazali Ismail	Designing of suitable peptide-based inhibitors of dengue virus NS2B-NS3 proteases using Computer-Aided Design Approach
NP-71	Maria Fatmadewi Imawati	Chemical and DNA Profiles Study of <i>Justicia gendarussa</i> Burm.f. Leaves

Room 8 : Pharmaceutical Chemistry and Pharmaceutics	
Meeting ID	963 4016 6125
Passcode	icphs3

Session 2: 13.25 – 14.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
PC-01	Juni Ekowati	m-Methoxycinnamic Acid as Prospective Antiangiogenic Drug Candidate
PC-02	Abdulsalam Qahtan	Nanosize crystalline cellulose synthesis from biomass using mild acid concentration
PC-07	ARUN KUMAR	Synthesis and Study of thermal behaviour of Gum Katira SIPN(Semi-inter Penetrating Network)
PC-09	Helmy Yusuf	Development and validation of HPLC method for the determination of curcumin entrapped in polymeric micellar powder
PC-15	Mohammed S. M. Saleh	characterization of phenolic compounds using LC/Q-TOF MS and the evaluation of alpha glucosidase of Parkia speciosa
PC-16	Ram Kumar Sahu	Standardization of Flavonoids Component by Using Chromatographic Fingerprinting Techniques
PT-02	Berlian Sarasitha Hariawan	The In Vitro Cellular Uptake and Cytotoxicity of Ursolic Acid Niosome Coated with Chitosan
PT-03	Dewi Isadiartuti	The thermodynamics of p-methoxycinnamic acid-cyclodextrin inclusion complex
PT-06	Dur Muhammad Lashari	Potency of Mucoadhesive Gingival Patch Loaded with Mangosteen Rind On The Level Of RANKL And OPG In Wistar Rat With Periodontitis
PT-07	Dwi Setyawan	Cocrystal Formation of Loratadine-Succinic Acid and Its Improved Solubility
PT-08	Eviomitta Rizki Amanda	The development of sample preparation method based on silica dispersive solid phase extraction for clean-up and preconcentration of hydroquinone in whitening cream
PT-09	Khater Ahmed Saeed AL-japairai	Systemic delivery of antidiabetic drugs via transdermal route: a review
PT-10	Lailiyatus Syafah	Characteristics, Physical Stability, Effectiveness of Dermal Collagen Improvement And Acceptability of Temugiring (Curcuma Heyneana Val.,&V.Zijp.) Extract Scrubs
PT-13	Maria Apriliani Gani	The impact of glutaraldehyde on the characteristics of BHA-GEL-GEN- GTA implant as gentamicin delivery system
PT-04	Dewi Melani H	Effect of VCO and Polyvinyl Alcohol on Cocos nucifera L. Antibacterial Peel Off Mask

Room 9 : Pharmaceutics	
Meeting ID	963 4016 6125
Passcode	icphs3

Session 1: 11.25 – 12.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
PC-22	Adryan Fristiohady	Design and Evaluation of Self-Nanoemulsifying Drug Delivery System (SNEDDS) Containing Wualae Fruit (<i>Etlingera elatior</i> (JACK) R.M. Smith) Extract
PC-23	Ahmed Yaseen	Formulation and characterization of Cationic Nanoemulsions a promising delivery system for topical antimicrobial therapy
PT-11	Li Ching Wong	Optimisation of biomass-based cellulose hydrogels for topical drug delivery
PT-12	Manmohan Singh Jangdey	Formulation and Evaluation of Antibacterial Novel Herbal Hand Sanitizer Gel Containing Aloe <i>Barbadensis</i> Extract
PT-14	Mayank Kumar Malik	Applicability of <i>Mandua</i> isolated polymer for formulation of floating Aceclofenac microspheres.
PT-15	Muh Agus Syamsur Rijal	Effect of ratio D- α -tocopheryl polyethylene glycol 1000 succinate and Poloxamer 407 on physical characteristics and dilution stability of mixed micelles (for delivery system of hesperitin)
PT-16	Muhammad Amirul Asyraf Noh	Discovery of new targeting agents against GAPDH receptor for antituberculosis drug delivery
PT-17	Ni Luh Dewi Aryani	Development and characterization of coenzyme Q10 nanostructured lipid carriers (NLCs) using tristearin and stearyl alcohol for dermal delivery
PT-18	Ni Putu Ayu Dewi Wijayanti	Optimization of Glyceryl Polyacrylate in Nanoemulgel of Mangosteen (<i>Garcinia mangostana</i> L.) Rind Fraction and Penetration Test of Preparations
PT-19	Odilia Stefani Salim	The effect of aloe vera and propylene glycol concentration on physical characteristics of chitosan-aloe vera film as wound dressing
PT-20	Praddep Pal	Recent Advancement in Novel Pulsatile Drug Delivery System
PT-21	Rahma Nafi'ah	Formulation and Stability Test for Forskolin Microemulsion
PT-22	Rahmi Annisa	Formulation and Characterization Self-nanoemulsifying Drug Delivery System (SNEDDS) of <i>Eleutherine palmifolia</i> (L.) Merr Extract using Miglyol 812 and Virgin Coconut Oil (VCO) as Carrier Oil
PT-35	Rita Rakhmawati	Optimization of emulgel tamanu oil (<i>Calophyllum inophyllum</i> L.) formula and testing its activities on skin wound healing
PT-05	Dini Retnowati	The Stability and Irritability Study of the Combination of Chitosan-Aloe vera Spray Gel as Wound Healing

Room 9 : Pharmaceutics	
Meeting ID	963 4016 6125
Passcode	icphs3

Session 2: 13.25 – 14.55 (Western Indonesia Time, UTC+7)

Poster Code	Name	Title
PT-23	Retno Sari	The Effect of Chitosan Type and Drug-Chitosan Ratio on Physical Characteristics and Release Profile of Ketoprofen Microparticles Prepared by Spray Drying
PT-24	Samah Hamed Almurisi	strategies to improve the stability of solid dispersion drug products
PT-25	Shahad Hussein Shakho	Investigation of the Effect of Chromolaena Odorata Extract and its Formulations on HDFa Cells in Terms of Skin Photoaging
PT-26	Taha Nazir	Emerging Immunomodulation Technologies May Potential Improve the Clinical and Pharmaceutical Health Care
PT-27	Tristiana Erawati	Effect of Rosemary Oil on Characteristics and Physical Stability of Ubiquinone-Nanostructured Lipid Carrier System
PT-28	VINOD NAUTIYAL	Comparative pharmacognostical evaluation of different parts of Chicorium intybus a potential antidiabetic herb with its suitability for novel drug delivery system.
PT-29	Yuniar Tri Saskia Revi	VARIOUS CARRIERS STUDIES OF GENTAMICIN RELEASE FOR OSTEOMYELITIS THERAPY (Literature Review)
PT-30	Yee Tze Ung	Fabrication and characterization of graphene oxide for photodynamic therapy application
PT-31	MIKHANIA CHRISTININGTYAS ERYANI	Variation Concentration Effect of Propylenglycol, Glycerin and Polyethylenglycol 400 to Physical Properties and Dissolution Rate of Loratadine Liquisolid Tablet
PT-32	siti jubaidah	Preformulation cream from extract of red pidada leaves (<i>Soneratia caseolaris</i> L) as a sunscreen
PT-33	Chininta Amadea Wibowo	Profile of Compressive Strength And Degradation Rate of Implant With Biochermamic-Polymer Composite For Osteomyelitis Literature Review
PT-34	Amiliyatul Mawaddah	Laser activation for penetration of turmeric extract cream (<i>Curcuma longa</i>) into rat skin tissue (Wistar strain)
PT-36	Rita Rakhmawati	Antioxidant activity test of tamanu oil and development of peel-off gel mask cosmetic with variation of polyvinyl alcohol concentration

Abstracts of Poster Presentation

BS-01

Inhibition of Ras and STAT3 Activity of 4-(*Tert-Butyl*)-*N*-Carbamoylbenzamide As Antiproliferative Agent in HER2-expressing Breast Cancer Cells

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Abstract

Background: Patient with HER2-positive breast cancer exhibits poor prognoses in their course of the disease. An overexpression of HER2 may enhance Ras-MAPK and JAK-STAT3 pathway activation. As a result, an increase in breast cancer cell proliferation occurred, as indicated by Ki67 marker. Today, therapy for HER2- positive breast cancer is limited due to its significant side effects. This encourages more studies in developing anticancer drugs as antiproliferative agents. On the basis of previous studies, it is stated that a synthetic compound 4-(*tert-butyl*)-*N*-carbamoylbenzamide (4TBCB) has a cytotoxic activity in vitro against breast cancer cells expressing HER2. Therefore, this study was continued by analyzing the mechanism of 4TBCB compound against HER2 signaling inhibition on Ras and STAT3 pathway in breast cancer cells expressing HER2.

Methods: 4TBCB compound was administered to breast cancer cells expressing HER2 and then observed the expression of pHER2, pRas, pSTAT3 and Ki67 protein using the immunofluorescence assay.

Results: 4TBCB compound significantly lower the activity of pHER2, pRas, pSTAT3 and Ki67 proteins in comparison to cell control or lapatinib group.

Conclusion: 4TBCB compound may inhibit HER2 signaling on Ras and STAT3 pathway in HER2-expressing breast cancer cells.

Keywords: *HER2; Ras; STAT3; 4-(tert-butyl)-N-carbamoylbenzamide; antiproliferative; breast cancer cells.*

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BS-02

TOXICOLOGICAL SCREENING OF ELLAGIC ACID AND BOVINE BONE XENOGRAFT COMBINATION AS STIMULANT OSTEOBLASTOGENESIS ON BHK-21 FIBROBLAST CELLS

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Background: Ridge resorption cases in dentistry with bone graft limitations in osteogenesis. Bovine bone xenograft has excellent content similar to the composition of human bones and teeth, Ellagic Acid with polyphenol content, proven to be antioxidant, anti-inflammatory capable supports cell growth. There are no studies that combine the properties of ellagic acid and bovine bone xenograft for use as stimulants osteoblastogenesis.

Objective : To analyze Ellagic Acid toxicity on fibroblast cell in vitro.

Methods: This was a true experimental study using post-test only with control group design. Fibroblast cell was exposed with Ellagic Acid in eight different concentrations: 0.1%, 0.2%, 0.5%, 1%, 2%, 3%, 4% and 5%. Control group comprised of cell control and media group. All groups were exposed to MTT Assay test and measured using Elisa Reader.

Results: The calculation of cell viability value in EA groups at 0.1%, 0.2%, 0.5%, 1%, 2%, 3%, 4% and 5% concentration were 88.2%, 92.3%, 97.5%, 89.5%, 84.2%, 90.7%, 88.9% and 89.4% respectively.

Conclusion: All Ellagic Acid and bovine bone xenograft combinations are not toxic towards BHK-21 fibroblast cells.

Keywords: *Bovine bone xenograft, Ellagic acid, Fibroblast cells, MTT assay*

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BS-03

Animal model of liver cancer in mice induced with n-nitrosodiethylamine

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Abstract

Background: During the development of cancer research, it is important to make an animal model of cancer to study the disease and the best therapeutic choices. Inducing hepatocarcinogenic N-Nitrosodiethylamine (NDEA) has been reportedly able to induce hepatocellular carcinoma in mice by causing instability of DNA through the presence of pro-mutagenic products. This study aimed to evaluate the liver cancer model of mice induced with hepatocarcinogenic NDEA.

Methods: The BALB-c mice were induced with NDEA 25mg/kg body weight once a week for five weeks intraperitoneally and it was then evaluated for the body weight during study periods. The mice were then sacrificed and excised for evaluating their organs including physical and morphological appearances.

Results: the results showed a significant decrease of body weight of mice after 5 times induction of 25 mg NDEA /kg per week intraperitoneally. Different morphological appearances and weight of mice organs had also been observed in mice. These results might indicate severe hepatocellular injury.

Conclusion: it can be concluded that inducing mice with NDEA intraperitoneally resulted in liver cancer progress.

Keywords: *liver cancer, animal model, hepatocarcinogenic, N-Nitrosodiethylamine.*

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BS-04

The Effect of Sodium Diclofenac on Callus Formation in White Male Rat (*Rattus Norvegicus*) Cruris Fracture Healing

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Abstract

Background: NSAID such as sodium diclofenac is a common treatment to relieve pain associated with bone fractures. The bone healing process consists of four stages, which are inflammation, soft callus formation, hard callus formation, and bone remodeling. Previous studies mentioned that NSAID (sodium diclofenac) intake could inhibit the bone healing process. The aim of this study is to examine the effect of sodium diclofenac intake on callus formation in fracture healing.

Methods: In this study, 36 rats (*Rattus Norvegicus*) with fractures were used and divided into 2 groups: 18 rats for the control and 18 rats for the treatment group. In the treatment group, each rat was given 1.8 mg sodium diclofenac/150 grams of body weight per day, while in the control group, each rat was given CMC-Na 0.5% with equal volume as sodium diclofenac in the treatment group. After 28 days, all the rats were stunned until dead. Then the diameter and strength of their calluses were measured.

Results: The strongest callus in the treatment group was found in the 6th observation, with a value of 59 N and a diameter of 4 mm. In the control group, the highest callus strength was 77 N with a diameter of 7-8 mm. These measurements were found on the 5th, 7th, 8th, 9th, 16th, and 17th observations.

Conclusion: Sodium diclofenac with a dose of 1.8 mg/150 grams of body weight could decrease the callus quality on fracture healing.

Keywords: bone fracture, sodium diclofenac, *Rattus norvegicus*, callus strength, callus diameter

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BS-05

The Role of Chondroitin Sulphate to Bone Healing Indicators and Compressive Strength Herry

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Abstract

Background: The function of bone is to protect the vital organs of the body. Mechanical strength, especially compressive strength, plays an important role in fulfilling its function. Fracture healing depends on several substances, such as collagen, glucosaminoglycane and proteoglycan. Chondroitin sulphate as part of proteoglycane is an important component in the formation of callus in fracture healing. The aims of study is to prove chondroitin sulphate role in supporting fracture healing.

Method: The in vivo experiment has been performed to *Rattus norvegicus* which met the inclusion criteria (age 3 months, 200-300 g weight), 18 males of *Rattus norvegicus*, wistar strain, were divided into three equal groups of 6 rats each. The first group was given chondroitin sulphate 7 mg in 2 ml distilled water /200 gr weight for 2 weeks. The second group was given chondroitin sulphate 7 mg in 2 ml distilled water /200 gr weight for 4 weeks. The third group was given distilled water.

Results: There were significant differences in the increase of TGF- α , the number of osteoblasts, and callus compressive strength in the groups with chondroitin sulphate treatment for 2 weeks and 4 weeks, compared to the control group ($p < 0,01$).

Conclusion: Administering chondroitin sulphate in a dose of 7 mg in 2 ml distilled water for 2 weeks and 4 weeks may increase production of TGF- β , the osteoblast numbers and the callus compressive strength in fracture healing.

Keywords: *Chondroitin sulphate, TGF- β , osteoblast number, callus compressive strength, Rattus norvegicus*

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BS-06

Resveratrol ameliorates physical and psychological stress-induced depressive-like behavior

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Abstract

Background: Stress is a body's reaction that occurs due to pressure or environmental demands that cause psychological and biological changes. Prolonged stress causes several disorders such as anxiety and depression. Depression has a profound effect on all aspects of life, but currently antidepressants have some problems with their effectiveness and side effects. Resveratrol is a compound from red wine that is known to have an ability to regulate the hypothalamic-pituitary adrenal axis. This study aimed to determine the effect of resveratrol on psychological stress-induced depressive-like behavior in mice.

Methods: Mice were divided into control, physical stress, psychological stress groups. Treatment was conducted with fluvoxamine 20 mg/kg and resveratrol 20, 40, 80 mg/kg for 7 days. Depressive-like state was evaluated using an open field test, tail suspension test and forced swim test one day after the last induction.

Results: Both physical and psychological stress induction increased depression-like behavior in mice. Resveratrol as well as fluvoxamine reduced depression-like behavior.

Conclusion: Resveratrol ameliorates depressive-like behavior induced by physical and psychological stress.

Keywords: *resveratrol, depressive-like behavior*

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BS-07

The Effect of Various High-Fat Diet on Liver Histology in The Development of NAFLD Models in Mice

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Abstract

Background: Nonalcoholic fatty liver disease (NAFLD) is highly prevalent worldwide. The development of NAFLD is increasing rapidly in the world, along with changes in lifestyle. Excess lipid intake is one of the risk factors for NAFLD. The NAFLD model is induced by a high-fat diet contains SFA, MUFA, and ω -6 PUFA. This study aims to assess the effect of high-fat diet variation on liver histology in developing NAFLD models in mice.

Methods: Thirty-six male mice (Balb/c) were divided into six groups fed a high-fat diet containing beef tallow 45%, beef tallow 60%, vegetable ghee, animal ghee + corn oil, vegetable ghee + corn oil for 28 days and compared to a control group fed a chow diet. All of the mice were fed with a high-fat diet in the form of pellets *ad libitum* for 28 days. Bodyweight and food intake were measured every day. At the last day of treatment, animal were sacrificed and the Liver were taken for histological analysis.

Results: This study showed that NAFLD model development can be achieved in all group mice that were fed a high-fat diet with different degree of NAFLD. Beef tallow 60% had the worst liver histology.

Conclusion: Thus, based on this study, it was found that high-fat diet variations influenced the development of NAFLD models in mice, particularly concerning liver histology.

Keywords: *nonalcoholic fatty liver disease, NAFLD, high-fat diet, liver histology, mice.*

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BS-08

Predicting the Molecular Mechanism of Glucosamine in Accelerating Bone Defect Repair By Stimulating Osteogenic Proteins

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Abstract

Background: Bone defect is serious condition that can be caused by pathological conditions or local trauma. Chitosan is a polymer developed as a scaffold to treat bone defect. However, the mechanism by which chitosan can accelerate bone growth in defect area is still unclear. This study aims to identify proteins which are crucial to the osteogenic properties of chitosan using an in-silico study.

Methods: Molecular docking was carried out on chitosan monomer, which are D-glucosamine and glucosamine 6-phosphate units against BMP-2 protein, fibronectin, fibroblast growth factor, and phosphate transporter (PiT) using AutoDock Vina. Ligand preparation was carried out using Chem3D version 15.0.0.106, while protein preparation was performed using AutoDockTools version 1.5.6.

Results: The results showed that glucosamine 6-phosphate had the best binding affinity with fibronectin and PiT, which was $-5.7 \text{ kcal mol}^{-1}$ on both proteins, while D-glucosamine had the best binding affinity with PiT ($-5.2 \text{ kcal mol}^{-1}$).

Conclusion: This study suggests that the osteogenic properties of chitosan may be due to the presence of bonds between glucosamine units and fibronectin and/or PiT. However, in vitro studies still need to be done to prove this.

Keywords: *Chitosan, glucosamine, bone defect, scaffold, molecular docking, osteogenic.*

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BS-09

The role of Pharmacogenetics and Pharmacometabonomics in the personalization of Ticagrelor Antiplatelet Therapy

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Abstract

Background: Ticagrelor is an antiplatelet administered orally and classified as cyclopentyltriazolopyrimidine, which binds inversely to P2Y₁₂ receptors. Unlike prasugrel and clopidogrel, ticagrelor does not require metabolism activation. Thus, in theory, it lacks the variability seen with CYP polymorphisms and thus produces a more stable antiplatelet effect.

However, clinical and laboratory experiments showed some defects in the P2Y₁₂ receptor antagonism of Ticagrelor. Most of its variable platelet reactions are unexplained, despite knowledge of several genetic and non-genetic factors, which pose as challenges to the personalization of Ticagrelor therapy. Pharmacometabonomics which is a process of discovering new biomarkers of drug response or toxicity in biofluids into predicting drug response have been exploited to predict drug response. The advantage of pharmacometabonomics is that it not only predicts the response but provides comprehensive information on metabolic pathways which are implicated by the response. Integrating Pharmacogenetics with pharmacometabonomics provides insight into unknown genetic in addition to nongenetic factors related to the response.

Method: The current study reviewed the literature related to the factors that are associated with variable platelets reactivity to Ticagrelor and evaluated the current methods employed to personalize Ticagrelor therapy.

Result: This review found that currently, pharmacometabonomic techniques are not used to predict the response to Ticagrelor. It also shows that there are limitations to the use of pharmacogenetics alone to assess the response to Ticagrelor.

Conclusion: This review identifies that integration of pharmacogenetics with pharmacometabonomics approach can be used to predict Ticagrelor's outcome.

Keywords: *Pharmacogenetics, Ticagrelor, Pharmacometabonomics, antiplatelet therapy, personalized therapy*

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BS-10

Gastroprotective effect of fluvoxamine and ondansetron on stress-induced gastric ulcers in mice

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Abstract

Background: The association between stress and gastric ulcers has been well reported. This study is divided into two parts: the first part of this study is consisted of analyzing the effect of fluvoxamine administration by intracerebroventricular and intraperitoneal injections on stress induced gastric ulcers, the second part is to investigate the effect ondansetron in influencing the protection of the gastric mucous by giving fluvoxamine to the mice before being induced with stress.

Methods: Water Immersion Restraint Stress (WIRS) was used to induce stress. Fluvoxamine 50 mg/kg and 100 mg/kg were intraperitoneally administrated and fluvoxamine 9.3 µg and 18.6 µg were intracerebroventricularly administered 30 minutes before the induction of stress. Meanwhile, single drug (monotherapy) and in combination drugs are given to the mice, ondansetron 3 mg/kg given intraperitoneally at 60 minutes and fluvoxamine 50 mg/kg, 100 mg/kg orally at 30 minutes before stress induction.

Results: The obtained results show fluvoxamine 50 mg/kg, fluvoxamine 100 mg/kg intraperitoneally administrated and fluvoxamine 18,6 µg intracerebroventricularly administered had significantly reduced ulcer index with $p < 0.005$, $p < 0.001$, and $p < 0.005$ while fluvoxamine 9.3 µg showed insignificant result. Fluvoxamine 50 mg/kg, fluvoxamine 100 mg/kg and ondansetron 3 mg/kg monotherapy have a significant reduction in ulcers with $p < 0.005$, $p < 0.001$, and $p < 0.05$ while the fluvoxamine-ondansetron combination showed insignificant reduction in ulcers.

Conclusions: Fluvoxamine with different routes of administration and ondansetron monotherapy before stress can reduces occurrence of gastric ulcers while the combination drug doesn't increase potency protection against the gastric mucosa by fluvoxamine.

Keywords: *fluvoxamine, gastric ulcers, intracerebroventricular, intraperitoneal ondansetron, stress.*

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BS-11

Mitragynine alleviates pain-like behaviour in pain animal model

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Abstract

Background: Mitragynine, an indole alkaloid of *Mitragyna speciosa* commonly known as kratom was found to possess analgesic effects by binding partially to opioid receptors similar to morphine. Although mitragynine has structurally different from morphine, it was found to have broader spectrum of pharmacological properties. Mitragynine was reported to inhibit an *in vitro* inflammatory model by inhibiting cyclooxygenase enzyme-2 (COX-2) expression. Yet, no study has been done to identify the effective dose of mitragynine for the treatment of pain via this systemic anti-inflammatory pathway. Therefore, the acetic acid writhing model was adopted to investigate the analgesic and anti-inflammatory effects of mitragynine.

Methods: Both male and female Sprague Dawley rats were pre-treated intraperitoneally (i.p.) with either mitragynine (1, 5, 10, 12.5, 15 or 30 mg/kg), vehicle (20% Tween 80) or indomethacin (1 mg/kg) 30 minutes prior to 2% acetic acid administration (i.p.) and the number of writhes was recorded for 60 minutes. The percentage of inhibition of pain was evaluated by comparing with vehicle and indomethacin. A dose-response curve was generated and mean effective dose (ED₅₀) was calculated from the curve.

Results: All mitragynine doses except 1 mg/kg significantly reduced the number of writhes ($p < 0.001$). Mitragynine (15 and 30 mg/kg) demonstrated significantly higher percentage of inhibition than indomethacin ($p < 0.01$ and $p < 0.05$, respectively). The highest percentage of inhibition was mitragynine (30mg/kg) and the ED₅₀ value was found to be 3.578 mg/kg.

Conclusion: Mitragynine alleviated pain-like behaviour and was proven to possess analgesic effects via anti-inflammatory pathway at an effectively low dose.

Keywords: *Mitragynine, analgesic, anti-inflammation, pain behaviour*

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BS-12

Molecular characterization of encoding gene of second internal transcribed spacer (ITS-2) of *Sarcoptes scabiei* in rabbits from several areas of East Java, Indonesia

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Abstract

Background: Scabies is an infectious disease which is caused by *Sarcoptes scabiei* mites and considered as an emerging/re-emerging parasitic disease that threatens human and animal health globally. The ITS-2 encoding gene was chosen as the main focus in this study because ITS-2 *Sarcoptes scabiei* was used as a gene marker to detect genetic mutations caused by differences in geographical location. This study purpose to determine the molecular characterization of encoding gene of the ITS-2 of *Sarcoptes scabiei* in rabbits from several areas of East Java.

Methods: collecting *S.scabiei* mites from rabbits scabies from Surabaya, Sidoarjo, Mojokerto, Pasuruan and Nganjuk; DNA extraction with minikit QIAamp DNA; PCR amplification; nucleotide sequence analysis; homology and phylogenetic tree using the Neighbor-Joining method in the program MEGA-7.

Result: The PCR product of the samples showed the DNA band tape at 304 bp. Homology analysis results from the five samples showed identity with the range of 91.23-98.68% with *Sarcoptes scabiei* origine isolate from China (KX695125.1). Phylogenetic tree analysis results showed that the sample from several areas of East Java close to *S. scabiei* samples from *Capricornus crispus*, Japan isolates (AB820977.1), Rabbit, Chinese isolates (KX695125.1 and EF514469.2) and *Ferral raccoons*, Japan isolates (AB36384.1) and many other isolates present on NCBI data.

Conclusion: The homology analysis of all samples showed identity more than 91.23% with isolate China (KX695125.1). The sequences of ITS-2 gen of *S.scabiei* from rabbits in several area were relatively close to *S.scabiei* obtain various hosts from NCBI data.

Keywords: *Sarcoptes scabiei*, ITS-2, scabies, rabbit, East Java, Indonesia

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BS-13

Osteoblast Iron Genes: Real Time PCR and Microarray Hybridization Approach Under Hyperoxia

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Abstract

Background: Iron is essential for cell growth, differentiation, electron transfer and oxygen transport. Hyperoxia may increase turnover of bone matrix component with a net effect of an accelerated bone growth. Although hyperoxia was claimed could increase osteoblast activity, but expression level in possible genes which play role in proliferation is still unclear. This research aims to prove the differences of expression level of transferrin receptor gene and iron regulated transporter and other genes of 7F2 under 24 hours normoxia, 24 hours hyperoxia and 48 hours hyperoxia and the effect of hyperoxia by using osteoblast cell culture 7F₂.

Methods: Reverse transcriptase, Real Time PCR and microarray is used to qualitatively detect gene expression. The computer softwares such as NCBI data base, Software Affymetrix, DNA Strider program, Genomatix – DiAlign program, Oligo 5.0 program (Software primer design) from Wojciech & Piotr Rychlik, Genetyx-Mac version 8.0 have been used to analyze the PCR Result.

Results: Under 24 hours hyperoxia, there were 3884 copies of transferrin receptor mRNA per 1.000.000 copies of GAPDH mRNA. After 24 hours hyperoxia, 8325 copies of transferrin receptor mRNA per 1.000.000 GAPDH mRNA copies were found showing 2.1 fold up regulation. After 48 hours hyperoxia, there was no significant increase at level of expression of transferrin receptor mRNA, 8079 mRNA copies per 1.000.000 copies mRNA were found (2.0 fold upregulation compared with 24 hours normoxia).

Conclusion: It can be concluded that hyperoxia might have effect on upregulating the expression of some osteoblast genes which might have an impact in osteoblast activity.

Keywords: *Osteoblast, transferrin receptor gene, iron regulated transporter gene, hyperoxia*

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BS-14

A ketogenic diet prevents weight gain through blood ketone levels in mice

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Abstract

Background: The prevalence of obesity is increasing in Indonesia and worldwide. Management methods development needs to be done for optimization, one of which is diet. The aim of this study was to determine the effect of a ketogenic diet on body weight.

Methods: Fourteen male mice (20-30 g) aged 2-3 months, divided into K1 (standard diet) and K2 (ketogenic diet) were given diet for two weeks *ad libitum*. Body weight and blood ketone levels were measured in pre and post-treatment. Blood ketone levels were measured using a ketonemeter, blood drawn from the mice tail. Data were analyzed for normality test, paired t-test, independent t-test, and bivariat pearson correlation test using SPSS.

Results: Body weight on K1 pre-treatment (24.57±2.82) g, post-treatment (32.57±4.16) g with p=0,000. Body weight on K2 pre-treatment (28.00±2.31) g, post-treatment (31.86±2.04) g with p=0,001. Δ body weight on K1 (8.00±2.71) g, K2 (3.86±1.77) g with p=0,005. Blood ketone levels on K1 pre-treatment (1.06±0.17) mmol/L, post-treatment (0.43±0.14) mmol/L with p=0,000. Blood ketone levels on K2 pre-treatment (0.59±0.20) mmol/L, post-treatment (0.91±0.07) mmol/L with p=0,006. Δ blood ketone levels of K1 (- 0.63±0.22) mmol/L, K2 (0.33±0.21) mmol/L with p=0,000. There is a significant correlation between Δ body weight and Δ blood ketone levels (p=0.001).

Conclusions: Body weight in the group that given ketogenic diet experienced lower body weight gain than the control group. This is due to a shift in energy use in the body from glucose to fat, which is marked by an increase of blood ketone levels.

Keywords: *ketogenic diet, weight gain, blood ketone, mice*

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BS-15

Modulation of blood glucose levels can prevent weight gain of mice on ketogenic diet

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Abstract

Introduction: Morbidity and mortality due to obesity currently exists increasing linearly with the increasing prevalence of obesity in the world. Diet as a therapeutic modality has been developed so the management is more optimal. This study aims to prove a ketogenic diet on body weight and blood glucose levels.

Methods: 14 male mice, aged 2-3 months, body weight (BW) 20-30 grams, divided into K1 (standard diet) and K2 (ketogenic diet), were given diet for two weeks *ad libitum*. Body weight and blood glucose levels were measurement at pre and post-treatment. Blood glucose levels were measured using a glucometer from blood taken from tail. Data were tested for normality, paired t-test, and independent t-test with SPSS.

Results: BW K1 pre-treatment (24.57±2.82) g, post-treatment (32.57±4.16) g with p=0.000. BW K2 pre-treatment (27.86±1.57) g, post-treatment (31.71±2.43) g with p=0.002. ΔBW K1 (8.00±2.71) g, K2 (3.86±1.86) g where p=0.006. Blood glucose levels at K1 pre-treatment (125.71±23.57) mg/dL, post-treatment (193.29±44.11) mg/dL with p=0.004. Blood glucose levels at K2 pre-treatment (146.29±24.25) mg/dL, post-treatment (127.86±13.73) mg/dL with p=0.008. ΔBlood glucose levels K1 (67.57±40.40) mg/dL, K2 (- 18.43±12.34) mg/dL with p=0.001

Discussion: Weight gain in ketogenic diet group experienced a lower weight gain than control group because ketogenic diet group has lower glucose levels. Low glucose will stimulate insulin secretion not too high so that the anabolic effect is lower when compared to the control group.

Keywords: ketogenic diet, weigh gain prevention, blood glucose, mice

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BS-16

Genetic Profile Mutation *rpoB* in Clinical Isolate of Rifampicin Resistant *Staphylococcus aureus*

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Abstract

Background: *Staphylococcus aureus* is one of the sources of nosocomial infection. MRSA eradication using combination antibiotics with rifampicin has shown good results with adjuvant rifampicin to improve the outcome of *Staphylococcus aureus* infections for a long time. Rifampicin-resistant *Staphylococcus aureus* affects the mutation of the *rpoB* gene in some codons. This research examines the mutation of the *rpoB* gene in *Staphylococcus aureus* that is resistant to rifampicin.

Methods: In this study, samples were obtained from blood, sputum, pus, and urine collected in the Microbiology Laboratory of DR. Sutomo Surabaya Hospital during May-September 2019. Then the dilution method was carried out to determine the minimum inhibition concentration for rifampicin resistant and dilution to determine the inhibition zone diameter. Then, DNA extraction was carried out from rifampicin-susceptible isolates as control and rifampicin-resistant isolates followed by identification of *rpoB* gene mutations by PCR and sequencing.

Result: There were nine isolates studied, four isolates rifampicin-resistant and five isolates rifampicin-susceptible. One of the rifampicin-susceptible isolates did not experience a genetic mutation. In four rifampicin-resistant isolates the most mutations occurred in His-481 codon (75%) followed by the Ile-527 codon (25%). Isolates that are susceptible to rifampicin mutations at codons Pro-475 and Asn-474. One rifampicin-resistant isolate had two mutations in codons Ile-527 and Asn-474.

Conclusion: The type of mutation that causes the most rifampicin resistance is a missense mutation. Isolates susceptible rifampicin experience silent mutations. That it can be associated with the type of missens mutation of *rpoB* gene with rifampin resistance.

Keywords: *rpoB*, Rifampicin, *Staphylococcus aureus*, mutation, codon

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BS-17

Larvicidal toxicity and parasporal inclusion of native *Bacillus thuringiensis* BK5.2 against *Aedes aegypti* vector of Dengue Hemorrhagic Fever

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Abstract

Background: One of the biological control agents for Dengue Hemorrhagic Fever (DHF) vector was using *Bacillus* spp., that produces parasporal inclusion toxins. Native *Bacillus thuringiensis* BK5.2 isolated from natural soil in Baluran National Park, Banyuwangi, East Java, Indonesia has been shown to be toxic to *Ae. aegypti* larvae.

Methods: The purpose of this study was to determine the strength of toxicity in Lethal Concentration (LC) and the speed of toxicity in Lethal Time (LT) against third instar *Ae. aegypti* larvae and detection of parasporal inclusion toxin structure. Larvicidal toxicity was determined based on value of LC50, LC90 (CFU/mL) and LT50, LT90 (hours) with Probit analysis. Detection of parasporal inclusion by Transmission Electron Microscope (TEM) and the Scanning Electron Microscope (SEM).

Results: Toxicity test results at 24 hours and 48 hours exposure showed that LC50 and LC90 values were 11.6×10^6 CFU/mL and 22.7×10^6 CFU/mL, while the LT50 and LT90 values are 19.0 hours and 26.6 hours, respectively. Morphological observation of the dead larvae showed that there is damage on abdomen and thorax region. Detection by TEM and SEM showed that there is cuboidal parasporal inclusion.

Conclusion: Based on the results of this study, the native *B. thuringiensis* BK5.2 in the category of high toxicity against *Ae. aegypti* mosquito larvae, so it needs to be continued in efforts to develop local bioinsecticides against DHF vector, especially in Indonesia.

Keywords: Larvicidal toxicity, Parasporal inclusion, *Bacillus thuringiensis* BK5.2, *Aedes aegypti*

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BS-18

Quercetin promotes behavioral recovery and biomolecular changes of melanocortin-4 receptor in mice with ischemic stroke

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Abstract

Background: Ischemic stroke is one of the common causes of disability and death. The pathogenesis of ischemic stroke process becomes worse immediately after oxidative stress occurs. Quercetin is a flavonoid with an antioxidant ability. This study was aimed to investigate quercetin administration on the behavioral functions (motor and sensory) and expression of melanocortin-4 receptor (MC4R) in mice with ischemic stroke.

Methods: Male ICR mice were divided into sham, stroke, stroke with quercetin 100, 150, and 200 mg/kg. The stroke model was performed by blocking the left common carotid artery for 2 hours. Quercetin was intraperitoneally administered daily for 7 days. Evaluation was conducted during 2 weeks after induction using ladder rung walking test and narrow beam test for motoric function and adhesive removal test for sensory function. On day-14 mice were sacrificed, MC4R expression in dorsal striatum was determined using RT-PCR.

Results: Stroke decreased the motor, sensory function and MC4R mRNA expression in dorsal striatum. Quercetin improved motor and sensory function, and upregulated expression of MC4R.

Conclusion: Quercetin administration after ischemic stroke improves behavioral function, possibly through the upregulation of MC4R in the brain.

Keywords: *dorsal striatum, ischemic stroke, melanocortin-4 receptor, motor, quercetin, sensory*

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BS-19

Mitragynine improves cognitive performance in morphine-withdrawn rats

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Abstract

Background: The treatment of opiate addiction is an unmet medical need. Repeated exposure to opiates disrupts cognitive performance. Opioid substitution therapy, with, e.g. methadone, may further exacerbate the cognitive deficits. Growing evidence suggests that mitragynine, the primary alkaloid from the Kratom (*Mitragyna speciosa*) leaves may serve as a promising alternative therapy for opiate addiction. Therefore, this study aims to provide a better understanding in cognitive effects of mitragynine substitution in morphine- withdrawn rats.

Methods: Male Sprague-Dawley rats were given morphine at escalating doses to induce a spontaneous morphine withdrawal. Then, a mitragynine (5, 15, or 30 mg/kg) substitution was given for three days. Withdrawal signs were scored at 24, 48, and 72 hours while novel object recognition and attentional set-shifting were tested on the last day of the mitragynine treatment. Western blot was performed to determine the changes in level of pro brain derived neurotrophic factor (proBDNF) and Ca²⁺/calmodulin dependent kinase alpha (α CaMKII).

Results: Morphine significantly induced morphine withdrawal signs and cognitive deficits in both tests. The substitution with mitragynine was able to alleviate the withdrawal signs. Mitragynine did not affect the recognition memory, but significantly improved the reversal learning deficit in the morphine withdrawn rats. In addition, mitragynine also reduces the expression of proBDNF and α CaMKII to normal level after the spike up which caused by morphine withdrawal.

Conclusion: These data support the idea that mitragynine could be used as safe medication therapy to treat opiate addiction with beneficial effects on cognitive deficits.

Keywords: *Mitragynine; Kratom; Cognitive functions; Learning; Substitution therapy*

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BS-20

The Antineuroinflammatory Effect of Genistein in Microglia HMC3 Cell Line

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Abstract

Background: Neuroinflammation is one of the main causes of neurodegenerative diseases in postmenopausal women, who experience estrogen deficiency. Phytoestrogens, such as Genistein, are an alternative treatment for estrogen deficiency-induced neuroinflammation. The aims of this study were to determine the antineuroinflammatory effect of Genistein through measurement of MHC II and Arg1 expression on microglia HMC3 cell line, as well as to know that the effect occurs in ER-dependent manner, through the measurement of free-ER β expression.

Methods: The cells were cultured in 24-well microplates and induced with IFN γ 10ng for 24h to activate cell to M1 phenotype which have proinflammatory characteristics. Genistein with concentration of 50 μ M was added to the cells. The expression of MHC II, Arg1, and free-ER β as markers was tested using immunocytochemistry method and CLSM instrument. In silico approach was also conducted to determine the interaction between Genistein and ER β compared to 17 β -estradiol.

Results: Genistein could decrease MHC II expression and increase Arg1 expression in microglia HMC3 cells compared to negative controls at $p < 0.005$, with expression value of $472.577 \pm 26,701$ AU and $114.299 \pm 6,578$ AU. But Genistein could not decrease the free-ER β expression in cells at $p < 0.005$. The results of in silico analysis showed that Genistein was 17 β -estradiol agonist.

Conclusion: Genistein shows antineuroinflammatory effects by decrease the MHC II expression and increase Arg1 expression in microglia HMC3 cell line. However, the effect does not occur through the binding of Genistein to ER β , but it is likely to occur through the binding of Genistein with other kinds of ER.

Keywords: Antineuroinflammatory, Genistein, Phytoestrogens, Microglia HMC3 Cell Line

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BS-21

The effect of ketones bodies on human adipocytes *in vitro*, a preliminary implication on ketogenic diet

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Abstract

Background: Ketogenic or low-carbohydrate and high fat diet (LCHF) has increasingly gained recognition as an alternative to the conventional low-fat diet (LFD) in achieving effective weight loss and managing obesity. Ketone bodies are vital alternative metabolic fuel source during fasting, starvation and adherence to low carbohydrate diets; hence the use of ingestible ketone body precursors to increase and maintain ketosis is an alternative to ketogenic diets. White adipose tissue (WAT) browning is hypothesized to confer numerous metabolic benefits by decreasing adiposity and increasing energy expenditure. The mechanisms on how the exogenous ketone bodies contribute to the overall lipid utilization and metabolism in the fat cells and specifically WAT browning remained uncertain. The objectives of this study were to determine the effects of ketone bodies (D-β-hydroxybutyrate and acetoacetate) on WAT browning markers and free fatty acid (FFA) and triglyceride levels in human adipocyte cells.

Methods: Preadipocytes were first differentiated to adipocytes prior to treatment with ketone bodies (beta- hydroxybutyrate and acetoacetate). Markers were assessed using RT-qPCR. FFA and triglyceride levels were assessed using commercial lipolysis assay kits.

Results: WAT browning marker such as UCP-1 and PDRM16 mRNA were expressed significantly in the adipocytes when treated with either 10 μM or 100 μM D-β hydroxybutyrate as compared with control. However, it did not affect the lipolysis of adipocytes at all concentrations. Acetoacetate has no significant effects on the markers but significantly induces lipolysis at concentrations 1 and 10 μM but remained insignificant at most concentrations.

Conclusion: Ketone bodies appears to promote WAT browning and lipolysis.

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BS-22

Potential roles of endoplasmic reticulum stress and cellular proteins implicated in diabetes

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Abstract

The role of the endoplasmic reticulum (ER) has evolved from protein synthesis, maturation, and other secretory pathways to form a foundation for cellular metabolic functions. Maintaining an ER hemodynamic balance is essential for cellular survival. When there is an imbalance in ER activities due to stressful metabolic circumstances, it activates a process known as unfolded protein response (UPR) in order to sustain a normal activity of the cell. In the case of persistent stress, apoptotic signalling pathways initiates in the ER. Prolonged cellular exposure to extreme metabolic conditions such as hyperglycaemia, hyperinsulinemia, and hyperlipidaemia are crucial in the pathogenesis of diabetes, obesity, and, ultimately, diabetes. Consequently, these metabolic dysfunctions lead to the interruption of the ER physiological state resulting in the activation of UPR and ER stress. However, limited data exist regarding ER stress and its connection to diabetes, particularly the implicated proteins. Thus, this review highlights the role of ER stress in relation to some proteins involved in the pathogenesis of diabetes and to provide insights to possible pathways that could serve as novel targets for therapeutic intervention.

Keywords: *Diabetes, Endoplasmic reticulum, Endoplasmic reticulum stress, Hyperglycaemia, Hyperlipidaemia, Unfolded Protein Response*

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CP-01

Drug-Related Emergency Department Visits At Healthcare Facilities In Saudi Arabia: A Review Of The Literature

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Abstract

Background: The burden of drug-related problems (DRPs) is becoming an issue of healthcare concern. It has been responsible for many emergency departments (ED) visits to Saudi Arabia. We aim to summarise available data on DRP-related ED visits in Saudi Arabia and provide recommendations for preventive measures.

Methods: A systematic search of the literature was conducted using PubMed and Google Scholar database to identify eligible studies on DRP-related ED visits in Saudi Arabia. The review included research on ED visits linked to DRPs performed in Saudi Arabia from the inception of the database to January 2020. Study selection, data extraction, and assessment were performed based on PRISMA guidelines. Quality of studies was assessed using the National Institute of Health and Medical Research Council level of evidence.

Results: The initial search of literature generated 267 articles. After the study selection, 15 articles met our eligibility criteria and were included in the review. The pooled prevalence rate of the included studies was 16.0%. The commonly implicated DRP related to the ED visits were; adverse drug reactions, medication non-adherence, drug overdose, drug interactions. Central nervous system drugs and cardiovascular drugs were the most frequently involved drugs. Most of these visits resulted in moderate harm.

Conclusion: The prevalence of DRPs associated with ED visits is high in Saudi Arabia. One out of sixteen ED visits is related to DRPs. Therefore, the Saudi government should take interventions such as improved awareness of rational drug use should be implemented.

Keywords: *Drug-related problems (DRPs), Emergency Department (ED), Drugs, Saudi Arabia*

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CP-02

Assessment of information overload of COVID-19 in the general public

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Background: The overwhelming information about the coronavirus pandemic often makes it difficult to separate fact from fiction and rumour from deliberate efforts to mislead. People may find it difficult to understand and utilise genuine information from many sources simultaneously. In this pandemic situation, the general public may be at high risk of experiencing information overload on COVID-19, due to the frequent information in circulation. Therefore, we aimed to evaluate COVID-19 information overload (COVIO) among the general public.

Methods: This was a cross-sectional online survey using Google Forms™. A hyperlink to the online questionnaire was shared with members of the general public via social media. The questionnaire consists of two sections. The first section covered the socio-demographic information of the respondents while the second section comprised of items measuring the covid-19 information overload.

Results: The total number of respondents was 579. The mean (standard deviation) age was 33 (8.7) years. The respondents were mostly females, 335 (57.9%) and married, 302 (52.2%). The commonest educational level attained by the respondents was postgraduate, 316 (54.6%). Most of the respondents are on full-time work, 280 (48.4%) and majority are on non-health related jobs, 302 (52.2%). Most respondents receive COVID-19 information from a combination of social media and broadcast media 372 (64.2%). The information was mostly solicited 316 (54.6%) and received daily 369 (63.7%). The mean (SD) COVIO score was 19.40 (4.12%). Among the eight items of the COVIO tool, three items showed higher tendency for COVIO. Majority of the respondents agreed that “information about COVID-19 all starts to sound the same after a while” 426 (73.6).

Conclusions: The findings from this study demonstrated that COVIO is a common phenomenon experienced in the general public. This necessitates a call for awareness and orientation on the best information seeking behaviours to avert being overloaded with especially wrong information.

Keywords: COVID-19, information overload, general public

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CP-03

Knowledge, Attitude, and Practice of Medicine Disposal Among Community Pharmacists in Surabaya

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Abstract

Background: As healthcare professionals, pharmacists are responsible for medicine disposal, must have good behaviour toward medicine disposal. The improper medicine disposal can lead to environmental problems, and the remains of drugs that are disposed of offhandedly can be misused. This study aimed to assess knowledge, attitude, and practice of medicine disposal among community pharmacists in Surabaya and the correlation between variables.

Method: This cross-sectional study involved community pharmacists. The data were collected using a self-administered questionnaire that had been tested for its validity and reliability. The questionnaire was circulated online through social media such as Whatsapp and Line. There were 86 community pharmacists who agreed to participate in this study.

Result: The result showed that almost all respondents (n=59; 68,6%) carried out their disposal. Respondents showed good knowledge (n=75; 87,2%), positive attitude (n=85; 98,8%), and moderate practice (n=73; 84,9%) in disposal of medicine waste. A significant correlation was shown in knowledge and attitude (p=0,008), but there was no significant correlation between age and job experience as a pharmacist (p>0,05) towards disposal of medicine.

Conclusion: The conclusion of this study shows that pharmacist has good knowledge and attitude, and moderate practice of medicine disposal. Knowledge and attitude towards good disposal did not correlate significantly to good practice in the disposal of medicine. Age and job experience were not related to the knowledge, attitude, and practice of respondents regarding the disposal of medicine.

Keywords: *community pharmacist, medicine disposal, knowledge, attitude, practice*

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CP-04

Community pharmacy services in Kota Bharu, Kelantan: From public perspectives

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Abstract

Background: There is increasing demand for paradigm shift of work of community pharmacist from drug- centred profession to patient-centred pharmaceutical services. The prevailing competition, necessitate community pharmacies to develop an efficient marketing strategy or business model to attract new customer, maintain their patronage and develop consumer loyalty. The aim of the study was to assess the perception of public on community pharmacy and its services around Kota Bharu, Kelantan.

Methods: A total of 400 self-administered questionnaires were distributed to public in Kota Bharu through convenience sampling. Respondents aged 18 years and over, were residents in Kota Bharu and who were able to communicate in Malay were randomly approached.

Results: With a positive response of 97.5% (n = 390), results collected were analysed using descriptive and inferential statistical analysis. Only 3.3% of participants never visited a pharmacy. Majority of the participants visited pharmacy monthly or even less (49.5%), spent about 10 to 15 minutes in pharmacy (76.7%) and went to same pharmacy frequently (50.1%). The reasons for choosing pharmacy were due to strategic location (58.9%) and wide range of pharmaceutical products (49.1%). Respondents demands for longer operating hours (87.2%), more options of diagnostic tests (72.6%) and easily accessible pharmacist after office hours (66.4%). However, majority of respondents were still not willing to pay for pharmacist's consultation.

Conclusion: This study showed that the overall public perceptions on community pharmacy in Kota Bharu were mostly positive. It is recommended for community pharmacists to transform their services to meet public demands and expectations.

Keywords: *Community pharmacy, Pharmacist, Pharmacy services, Kota Bharu, patient - oriented*

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CP-05

Humanitarian Aid Involvement Factors Among IMARET Volunteers

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ABSTRACT

Background: In many domains, core activities of people's lives would be disrupted if volunteers were not present to provide much-needed help especially medical-based mobile clinics that rely heavily on the labour of volunteers. This study was designed to identify the factors related to humanitarian aid involvement of volunteers, to discover the background of volunteers attending Islamic Medical Association of Malaysia (IMAM) Response and Relief Team (IMARET) mobile clinic and outreach mission and to determine the association between the humanitarian aid involvement factors and the background of volunteers.

Method: This cross-sectional study used Volunteer Function Inventory (VFI) scale to measure the motivation factors of volunteers and total of 178 volunteers were recruited.

Result: Among the six motivation factors such as values, protective, understanding, enhancement, security and social factors being studied, understanding factor was found out to be the highest factor that motivated the volunteers. Based on the Fisher's Exact Test, the motivation factors were found to have no association with the demographic data of volunteers.

Conclusion: This study suggests that non-profit organisations should be aware that people joining volunteering or humanitarian aid work were not influenced by their sociodemographic characteristics.

Keywords: *humanitarian aid; volunteer; motivation factors*

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CP-06

The Use of Artificial Intelligence in New Normal Era Against Pandemic COVID-19 in the Field of Health Services

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Abstract

Background: Indonesia is experiencing pandemic Coronavirus Disease-19 (COVID-19) which has an impact on all sectors of life so that it is now preparing to the New Normal era, including in the aspect of health services. COVID-19, Severe Acute Respiratory Syndrome-Coronavirus 2 (SARS-CoV 2), previously called the novel Coronavirus Disease-19 (nCoV-19) and on 12 March 2020 has been declared as global health emergency by World Health Organization (WHO). New Normal is the era of coexistence with COVID-19 so that new habits emerge that were previously rarely or never practiced. One application that can be used is Artificial Intelligence (AI) to treat COVID-19 patients to prevent casualties for health workers. They are prone to contracting from the transmission of aerosols and droplets when treating patients, resulting in cytokine storm, Acute Respiratory Distress Syndrome (ARDS), Acute Lung Injury (ALI) which leads to death.

Methods: The method used in this Mini Review is to use a literature study approach.

Results: The results obtained are some relationships between AI, COVID-19 and health services through literature study exploration.

Conclusion: The COVID-19 pandemic has impacted on all aspects of life, so it is necessary to use AI to prevent casualties from health workers.

Keywords: *Artificial Intelligence (AI), COVID-19, New Normal, Health Services, ARDS-SARS-CoV 2*

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CP-07

PROFILE OF *gyrA* GENE MUTATION IN CLINICAL ISOLATE OF LEVOFLOXACIN RESISTANT *Escherichia coli*

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Abstract

Background: *Escherichia coli* is one of pathogen bacteria that caused nosocomial infection. Levofloxacin is one of the fluoroquinolones group antibiotics which is a broad-spectrum antibiotic that works effectively against *Escherichia coli*. This study aimed at identifying mutation in gen *gyrA* among *Escherichia coli* were resistant to levofloxacin.

Methods: The susceptibility of *Escherichia coli* was determined by disk diffusion. PCR and sequencing were performed to identify mutation in *gyrA*

Result: A total 10 isolates showed result resistance to levofloxacin and *gyrA* gene mutation in the amino acid changes. Nucleotide sequence analysis revealed point mutation in QRDR (quinolone resistance determining region) of *gyrA* Ser83 → Leu, Asp87 → Asn. Silent mutation were also found at codon Val85, Arg91, Ser111, Thr123

Conclusion: Mutation in *gyrA* gene affect the occurrence of bacterial resistance of *Escherichia coli* to levofloxacin.

Keywords: *gyrA*, Levofloxacin, *Escherichia coli*, mutation, codon

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CP-08

The Maximum Dose and Duration in The Therapy Single Use Methotrexate to Achieve Remission by Rheumatoid Arthritis Patients Through Disease Activity Score 28.

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Abstract

Background: One of the treatments for Rheumatoid Arthritis Methotrexate which a Disease Modifying Antirheumatic Drug therapy that is given to patients diagnosed with. The use of methotrexate requires the right doses and length of therapy. The effectivity of methotrexate can be accounted by the Disease Activity Score 28 (DAS28). The aim of this research is to find out the effective dose of and length of therapy with methotrexate measured by DAS28 score.

Methods: This research is a cross-sectional study with quantitative analysis, and data was collected from the Rheumatology Polyclinic of Saiful Anwar Hospital, Malang, from February-July 2018. The research has been given ethical clearance number 400/32/K.3/302018. The inclusion criteria for the 88 samples in this research are men and women, over 20 years of age, usage of only methotrexate for at least 3 months, and have an Erythrocyte Sedimentation Rate score without complications such as Inflammatory Bowel Disease, cancer, and Systemic Lupus Erythematosus. All data obtained was entered in formula DAS28. Statistic correlation analysis used both Pearson and Rank-Spearman correlation.

Results: In statistical analysis the results were no significant correlation between cumulative doses ($r=-0.091$; $p=0.400$), length of therapy ($r=-0.075$; $p=0.489$), average doses ($r=0.043$; $p=0.692$), and maximum doses ($r=0.074$; $p=0.492$) on arthritis rheumatoid activity measured with DAS28 score, but increased doses and length of therapy methotrexate can reduce DAS28 score.

Conclusions: The maximum dose and duration in the therapy single use of methotrexate was required to achieve remission in Rheumatoid Arthritis disease.

Keywords: *DAS28, Methotrexate, Rheumatoid Arthritis*

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CP-09

Renal and Cardiovascular Safety Profile of Remdesivir in Severe Covid-19 – From Computational Studies to Clinical Applications

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Abstract

Background: Compassionate use of Remdesivir for Covid-19 is an urge, despite of its clinical phase 3 status for Ebola, MERS, and SARS CoV-1 viruses; but there is a limited data about its safety profile for SARS-CoV- 2, especially in renal and cardiovascular system – the two vital organs which are rich in ACE2 receptor besides the lung. The aim of this study is to analyze comprehensively the safety profile of Remdesivir in renal and cardiovascular system.

Methods: A series of review were conducted based on prediction of Remdesivir's renal and cardiovascular safety profile computationally, as well as from its physicochemical properties, ex vivo, and pre-clinical studies. The results of these studies were then matched with current clinical studies on safety of Remdesivir in renal and cardiovascular system of severe Covid-19 patients.

Results: This section consist the summary of the most important results that obtained from study. The information needs to be clear and straightforward.

Conclusion: Remdesivir is a drug candidate for severe Covid-19 inpatients acting on inhibition of RdRp which matched renal and cardiovascular safety profile, based on computational, pre-clinical, and clinical studies. Further study constantly ongoing to analyzed the most suitable anti SARS-CoV-2 agents, while the virus and the disease have progressed.

Keywords: *Remdesivir, safety, renal, cardiovascular, in silico, clinical applications*

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CP-10

Developing Pharmacokinetics – Pharmacodynamics Model of Valproic Acid Syrup Based on Prediction of Population Pharmacokinetics Parameters and Seizure Frequency in Indonesian Pediatric Epilepsy Outpatients

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Abstract

Background: Valproic acid is a broad spectrum antiepileptic drug with known efficacy profile in pediatric patients, despite of its narrow therapeutic index. There is lack of valproic acid's pharmacokinetics profile in Indonesian pediatric subjects, partly due to high cost in conducting therapeutic drug monitoring. This study aimed to identify valproic acid's population pharmacokinetics (PK) parameters at steady state level and pharmacodynamics (PD) properties in pediatric epilepsy outpatients.

Methods: This observational study was conducted prospectively at Sanglah General Hospital during June – December 2019. The subject of this study were 38 Indonesian epilepsy patients aged 6 – 18 years old who adhered to valproic acid syrup monotherapy for at least 1 month. Five subject randomly selected for blood sample collection. Thus, valproic acid concentration level in the blood being analyzed as a comparison to its concentration predicted from Yukawa's steady state equation. Monolix® software was used to identify valproic acid population PK-PD parameters at steady state level.

Results: Population pharmacokinetics-pharmacodynamics of valproic acid syrup were $V_d \text{ pop} = 3.78 \text{ L}$, $Cl \text{ pop} = 3.19 \cdot e^{-15}$, $IC_{50} \text{ pop} = 7,29 \cdot e^{-6}$. Kendall Tau Correlation of predicted valproic acid's concentration levels derived from Yukawa's steady state equation with frequency of seizure was -0.66. Mean prediction error between predicted steady state concentration levels of 5 subjects and their related blood levels was $\leq 25\%$ and accepted as within clinically acceptable limit.

Conclusion: It needs further study to develop best matched PK-PD model of valproic acid syrup at steady state condition in Indonesian pediatric epilepsy outpatient.

Keywords: *valproic acid, pediatric, pharmacokinetics, prediction of concentration, seizure frequency*

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CP-11

Knowledge, Attitude and Practice of Antibiotics Disposal Among Household in Surabaya

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Abstract

Background: Antibiotic is one of medicine that patients usually stop to use it when symptoms improved. The leftover antibiotics sometimes were treated incorrect that may lead to antimicrobial resistance, environmental problems, and poisonings. The government has taken several actions to create drug management program mainly through the family approach. The study aimed to identify the knowledge, attitude and practice of antibiotics disposal among households in Surabaya and investigate the differences and correlation between variables.

Method: The data were collected using a self-administered questionnaire which developed based on the Indonesian Ministry of Health, the World Health Organization, the Food and Drug Administration guidelines and from the previous studies. This study is designed as a cross-sectional study with accidental sampling technique. About 236 respondents agreed to participate in the study.

Result: The results show that the majority of participants respondents have a good level in terms of knowledge 169 (71.6%), attitude 213 (90.3%) and practice 184 (78.0%). This study showed that four participants did not keep medications in their house. The types of medications that mostly kept by the participants were antibiotics, vitamins and analgesic or antipyretics, in which 132 (55.9%) of them stated that they kept antibiotics at home. There was a significant difference in terms of knowledge and practice between male and female participants ($p < 0.05$). There was also a significant difference is found in terms of practice between each educational level ($p < 0.05$). A coefficient of correlation between knowledge and practice is found to be, which was significant ($p < 0.05$).

Conclusion: Although the majority of household in Surabaya had good knowledge, attitude and practice, they still need educations and publications of antibiotics disposal guidance and its impacts by enhancing pharmacists and the other healthcare personnel role supported by the government.

Keywords: Antibiotic Disposal, Attitude, Household, Knowledge, Practice

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CP-12

The Effect of Intermediate Medication Review on Lifestyle Changes and Clinical Outcome in Patients with Diabetes

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Abstract

Background: Pharmacist has an important role in the management of diabetes, including improving the patient's lifestyle and glycemic control. One of the pharmaceutical care implementations and the core element in medication therapy management is medication review. Intermediate medication review (IMR) is a medication review that can be applied in community pharmacy with limited access to patient clinical data.

Objective: This study aims to determine the effect of IMR on (1) lifestyle changes (smoking behavior, caffeine and/or alcohol intake, diet and physical activity) and (2) clinical outcome (FBG) in patients with diabetes.

Methods: A Quasi-experimental study using pre-post design assessment was conducted to 65 patients with Type 2 Diabetes Mellitus divided into intervention and control groups, respectively. Patients were assigned to six community pharmacies in Surabaya. The study was conducted from December 2019 to February 2020 with patients were required to undergo monthly clinical assessment. The data were analyzed using non-parametric Mann

Whitney test. The significant difference between groups is indicated by $p < 0.05$.

Results: The lifestyle assessment of patients in the intervention group showed an increase in non-smoking behavior and non-caffeine and/or alcohol intake (54.5% to 75.8%) and an increase of dietary behavior and/or physical activity (57.6% to 69.7%). The clinical outcome measures in the intervention group showed that there was a significant difference ($p = 0.003$) in the mean value of FBG and there was a significant difference in the FBG value between the two groups.

Conclusion: IMR has a positive effect on lifestyle changes and improved clinical outcome control in patients with type 2 diabetes.

Keywords: *Intermediate Medication Review, diabetes, pharmacist*

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CP-13

Study of Community Knowledge and Attitude in Recognizing Asthma Symptoms and Using Medicines When Facing Asthma Attacks: A Cross-Sectional Study

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Abstract

Background: Uncontrolled asthma may be life-threatening. Poor understanding of disease process and appropriate medication use appears to influence community attitude when facing emergency situations regarding asthmatic patients, thus contributing to increasing the risk of mortality. The purpose of this study was to analyze community-level knowledge related to asthma, attitude towards asthma management and the ability to use medicines when facing an asthma attack. In addition, we also evaluate the relationship between knowledge and attitude socio-demographic profile.

Methods: This observational, cross-sectional study was conducted among the community in Gresik, Indonesia during March to July 2019. Participants included in this study were adults, can read, write, and communicate well. Participants filled the questionnaire to evaluate the level of knowledge and attitude regarding asthma disease.

Results: In total, 100 participants were selected with 91% were women, with mean age of 49.11 ± 14.42 years and had various levels of education. The community showed good knowledge by getting a score of 76%. Knowledge regarding recognition of asthma symptoms scored the highest (83%). However, it was lacking on the knowledge about medication use in asthma, especially in identifying the drug choice (21%) and inhaler use (48%). The community also showed a 'positive' attitude by getting a score of 89%. Most participants (72%) agreed that when inhaled drugs are unable to relieve the asthma attack, they need to bring the patient to hospital.

Conclusion: The level of knowledge in recognizing asthma symptoms among the community was good, but we identified misconceptions about asthma medication especially in inhaled drug use. Overall, the community showed a positive attitude towards asthma perception and management of asthma attacks. We also found that the level of knowledge and attitude correlated to the history of asthma.

Keywords: *asthma, medicine, knowledge, attitude, drug information*

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CP-14

Levothyroxine on Hypothyroidism Following Adenoma of Pituitary: a Case Reports

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Abstract

Background: Hypothyroidism may result from an abnormality in the pituitary gland, such as in pituitary adenomas. Levothyroxine is a synthetic thyroxine and is the treatment of choice for hypothyroidism. This case report presented a patient with pituitary adenoma given a dose-titrated of levothyroxine.

Case Presentation: A 17-year-old boy experienced headache for over 6 months followed by double vision and gradual visual loss in the last 3 months along with swallowing difficulty. Brain Magnetic Resonance Imaging (MRI) scan with contrast in pituitary region revealed a microadenoma of 1.8 cm in size, which then initiated the thyroid function tests. Hypothyroidism was found with thyroid stimulating hormone (TSH) level was 1,228 mIU/L or below functional range and free T4 (FT4) level was 0,64 mIU/L. He was qualified to endoscopic endonasal transsphenoidal hypophysectomy (EETH) of the tumor. Patient also suggested to given a dose of levothyroxine 50 mcg and adjusted to 100 mcg upon patient response. There was improvement in clinical conditions during the hormonal therapy and no adverse event was reported during hospitalization suggested that levothyroxine is safe and effective for the treatment of hypothyroidism caused by pituitary adenomas.

Conclusion: Levothyroxine is a drug choice of therapy for pituitary adenoma patient following hypothyroidism symptoms. Dosage should be individualized and adjusted based upon factors including patient age, body weight, cardiovascular status, concomitant medical conditions, and patient response. Smaller-dose initiation and slower-speed increase may be useful for treatment.

Keywords: *hypothyroidism, levothyroxine, pituitary adenoma, thyroid hormone*

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CP-15

Hydration Effect on Kidney Function & Serum Electrolyte in Children with Tumor Lysis Syndrome (TLS) And Risk of TLS

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Abstract

Background - Tumor lysis syndrome (TLS) is a life-threatening oncology emergency disorder, may cause acute kidney injury, arrhythmias, seizures, and sudden death. Hydration is used to prevent TLS in medium- high risk patients and treatment in TLS patients according to the pediatric protocol in dr. Soetomo Teaching Hospital, which requires close monitoring to prevent the progression of hematological malignancy towards TLS.

Objective - The study aimed to analyze the hydration effect on potassium, calcium, and phosphate levels; creatinine serum, and BUN level after hydration usage in pediatrics with TLS and risk of TLS.

Methods – This was an observational and prospective study conducted at dr Soetomo Teaching Hospital Surabaya for four months on 15 pediatric hemato-oncology patients who got TLS and in the risk of TLS. Laboratory parameters were observed in 11 days.

Results and Conclusions- Among the 15 patients who met the inclusion criteria, there were 8 TLS patients. The achievement of normal serum electrolyte levels and renal function parameters in TLS patients after hydration therapy were 67%, 75%, 0%, 50%, and 50% of potassium, phosphate, and calcium levels; Scr, and BUN, respectively. Meanwhile, patients who were at risk for TLS all parameters reached normal values. This difference in performance was caused by disease progression. Early detection and hydration prophylaxis are very important to reduce morbidity and mortality.

Keywords: *Hyperhydration, tumor lysis syndrome, TLS, serum electrolytes, BUN, creatinine serum*

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CP-16

Study of Anticoagulant In Patient with Coronary Artery Disease at Bhayangkara Hospital Surabaya

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Abstract

Background: Coronary Artery Disease (CAD) is the accumulation of atherosclerotic plaque build-up that causes narrowing of the blood vessel system so that the supply of oxygen to the myocardium decreases ruptured atherosclerotic plaque or erosion can cause ischemia. The prevalence of CAD in Indonesia is also increasing year to year. One of the therapies that can be given is anticoagulant which has a mechanism of action to inhibit the formation and activation of clotting factors. The use of anticoagulants in patients with coronary heart disease must be monitored and evaluated because the biggest side effect is the risk of bleeding. This study aims to determine the profile of anticoagulants in patients with coronary artery disease and identify drug-related problems (DRP) of anticoagulant drugs.

Methods: This is a retrospective study period from 1 January - 31 December 2019 at Bhayangkara Hospital Surabaya. The data were obtained from patient medical records. Patient data taken were data that met the inclusion criteria, namely patients with or without complications and comorbid diseases who were treated with a diagnosis of coronary heart disease and received anticoagulant therapy. The data obtained were processed descriptively.

Result: The results of a study anticoagulant on 40 patients with CAD patients revealed that the majority of patients were male (80%) and aged 61-70 (37.5%). The anticoagulants used were fondaparinux in 18 patients (45%) at a dose of 1 x 2.5 mg sc, enoxaparin in 15 patients (37.5%) at a dose of 2 x 60mg sc, and warfarin in 7 patients (17.5%) at a dose of 1 x 2-4mg per oral.

Conclusion: Side effects from the use of anticoagulants were not found in this study but drug interactions in the treatment of coronary artery disease have the potential to cause side effects.

Keywords: *Anticoagulants, Coronary Artery Disease, Fondaparinux, Enoxaparin, Warfarin, DRP*

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CP-17

Analysis of the Side Effect Of Qt Interval Prolongation in The Bedaquiline Regimen in Dr-Tb Patients

(The research was conducted at the Polyclinic TB-MDR Dr. Soetomo Hospital Surabaya)

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Abstract

Background: Indonesia is one of the top 20 countries with the highest prevalence of DR-TB worldwide with a percentage of new cases of 2.4% and re-treatment of 13%. Bedaquiline (BDQ) is one of the drugs that used in the individual long regimen treating DR-TB. Bedaquiline is also combined with levofloxacin (LFX) and/or clofazimine (CFZ) that can cause QT interval prolongation.

Objective: The aim was to study the differences in the use of BDQ regimens to the lengthening of the QT interval and to study risk factors (diabetes, hypokalemia, sex, BMI and age) in BDQ regimen.

Method: This study was an observational retrospective study with a total sampling method, which was conducted at Dr. Soetomo Hospital Surabaya. Samples from this study were patients diagnosed with DR-TB at RSUD Dr. Soetomo Surabaya in the period of January 2015 - December 2019 who used BDQ regimen and met the inclusion criteria.

Results: Data obtained from total sample in this study were 73 patients. The most widely used different regimens in this study were the combination of BDQ+LFX by 36 patients (49.3%), BDQ+LFX+CFZ by 16 patients (21.9%), BDQ by 11 patients (15.1%) and BDQ+CFZ 10 patients (13.7%). Out of 73 patients, 52 patients (71,2%) experienced lengthening of the QT interval and grade 1 of QTc interval prolongation occurred in most patients and also the onset was mostly one month after using BDQ regimen. The side effects of QT interval prolongation from groups of combination and risk factors were no difference in each month ($p > 0.05$).

Conclusion: This study can be concluded that there are no differences in the QT prolongation between the groups of bedaquiline regimen (BDQ, BDQ+LFX, BDQ+CFZ and BDQ+LFX+CFZ) and the groups of risk factors.

Keywords: *bedaquiline, DR-TB, QT interval*

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CP-18

KNOWLEDGE AND ATTITUDES OF HEALTHCARE PROFESSIONALS ON PRESCRIBING ERRORS

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Abstract

Background: One of medication errors in medication delivery process occurred in prescribing process particularly in dose calculations. At the moment, certain drug requires dose adjustment based on individual needs, yet there is no standard format on the prescription for those who may need the individual dose adjustment. This potentially allow for medication errors to occur. This study aimed to evaluate knowledge and attitudes of healthcare professionals on prescribing errors.

Methods: This was a quantitative research based employing a questionnaire which consisted of 12 items on knowledge and 10 items on healthcare professionals' attitudes towards medication errors in prescribing process. The investigator administered 300 questionnaires to physicians, nurses and pharmacists who attended conferences in Denpasar from July to October 2019.

Results: There were 30 physicians, 58 nurses and 69 pharmacists responded to the survey. This gave a response rate of 52.3%. All healthcare professionals agreed that errors may occur at prescribing, dispensing and administration process. All healthcare professionals understood that physician is responsible for ensuring drug safety in prescribing process and also supported a standardized form on drugs which may need drug dose personalization. In relation to item on the importance of collaboration in drug dose adjustment, although the healthcare professionals agreed on the statement, they had significant differences on the level agreement on it ($p = 0.029$). The healthcare professionals also supported to have a regular training on drug dose adjustment based on individual patients' regimentation. The professionals also had significant differences on the professionals who should have the competency on personalized dose calculation ($p < 0.001$). All healthcare professionals agreed that physician should have the competency, yet physician showed less agreement that other health professionals should have the competency.

Conclusion: All healthcare professionals have relatively good understandings of medication errors. They emphasis the need to have a regular training on medication safety for healthcare professionals.

Keywords: *prescribing errors, healthcare professionals, knowledge, attitudes*

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CP-19

A Reliability and Validity of Intercultural Sensitivity Scale (ISS) amongst Healthcare Professionals in Indonesia

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Abstract

Background: In the current healthcare service, collaboration amongst healthcare is essential. Studies have shown that one's culture influence their collaboration competence. Intercultural competence consisted of attitudes, skills and rules which may influence their ability to work with others. Previous study indicated that competence in the professions was considered as a culture in the professions. Yet, intercultural sensitivity scale (ISS) developed by Chen and Starosta (2000) aimed to measure ability in understanding and appreciated other cultures to improve effective intercultural communication. This study aimed to assess reliability and validity of ISS amongst healthcare professionals in Indonesian setting.

Methods: This was a quantitative study in which participants received a translated ISS questionnaire. The translated questionnaire has been reviewed for face validity and was distributed online to selected 460 healthcare professionals who work hospital and primary healthcare in Denpasar, Bali. Factor retrieved was identified using SPSS and confirmatory factor analysis.

Results: 299 healthcare professionals responded the questionnaire. This gave a 65% response rate. KMO Bartlett's test was more than >0.9 which indicated factors analysis was feasible in the data. Factor analysis showed three domains identified in the ISS. Confirmatory factory analysis was employed to assess confirmation of items within the factors. Goodness of fit criteria showed that items and factors had a good fit (RMSEA = 0.06; df = 249; CMIN/df = 2.2). These results indicated that the ISS was valid. In comparison to that of the original ISS which has five domains, this study found three domains identified namely engagement ($\alpha = 0.967$), confidence ($\alpha = 0.917$) and attention in interacting with other professions ($\alpha = 0.695$). The reliability scores also showed that the domains within the ISS were reliable.

Conclusion: The translated ISS Bahasa version employed in healthcare professionals in our setting was valid and reliable. Thus, the version can be employed to assess intercultural sensitivity amongst healthcare professionals in working with others.

Keywords: *reliability, validity, intercultural sensitivity, healthcare professionals, Indonesia*

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CP-20

Chronic Exposure of Pesticide on Aspartate aminotransferase (AST), Alanin transferase (ALT), and Cholinesterase Enzyme (CHE) in Farmers

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Abstract

Background: Pesticides are chemical compounds that function to protect plants from pests and are toxic. The continuous accumulation of pesticides can result in a decrease in cholinesterase enzyme levels and an increase in the levels of the aspartate aminotransferase (AST) and alanine transferase (ALT) enzymes which can cause poisoning symptoms. This study aims to determine the chronic exposure of pesticides to the levels of cholinesterase enzymes, ALT, and AST among farmers in the Lamongan area.

Methods: Determination of cholinesterase levels was carried out using spectrophotometric methods using thiol reagent 5,5'-dithio-bis (2-nitro benzoic acid) (DTNB), while ALT and AST examinations were carried out using a photometer with enzymatic method.

Results: The results of statistical tests showed that there was effect of the length of exposure on cholinesterase ($p = 0.155$), AST ($p = 0.837$) and ALT enzyme levels ($p = 0.829$).

Conclusion: It can be concluded that the length of exposure has no effect on the levels of the cholinesterase enzyme, AST and ALT. This is because many factors affect the cholinesterase, ALT, and AST enzymes levels.

Keywords: *cholinesterase, AST, ALT, pesticide.*

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CP-21

Gender differences in blood glucose type 2 diabetes patients with combination rapid and long acting insulin therapy

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Abstract

Background: Previous research suggests that there may be inter-gender differences in the profile of glycemic control achievable during the treatment of Type 2 Diabetes Mellitus. This preliminary study was conducted to determine if differences in glycemic outcomes in the treatment of type 2 diabetes might be observable amongst men and women with Type 2 Diabetes Mellitus in an Indonesian hospital..

Method: The study was conducted at Internist Polyclinic, in Outpatient of UniversitasAirlangga Hospital Surabaya. This was an observational prospective cohort study examining outcomes for 64 patients (32 men and 32 women) treated with insulin therapy. The main outcome measure was the extent to which subjects achieved concordance with target blood glucose parameters based on the American Diabetes Association (ADA) guidance.

Result: After three months of combination basal-bolus insulin treatment, the proportion of subjects who had fasting blood glucose values in the target range did not increase for either gender. For women there was a significantly higher proportion of subjects who achieved post prandial glucose values within the target range ($p = 0.04$)

Conclusion: In this small study, post-prandial glycemic outcomes were achieved for women but not men. More research is required to elucidate possible inter-gender difference in outcomes for subjects treated with basal-bolus insulin for Type 2 Diabetes Mellitus.

Keywords: *Blood Glucose Level, Rapid and Long-acting Insulin, Sex, Gender, Insulin, Type 2 Diabetes Mellitus*

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CP-22

Diabetes Mellitus Type 2 Screening in Hypertensive Patients at Primary Health Care Centres in Surabaya

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Abstract

Background: The prevalence of diabetes mellitus type 2 in hypertensive patients is 1,3-6,85 times higher than in nonhypertensive. High blood pressure is one of the significant predictors of type 2 diabetes. This study aimed to see the risk profile for type 2 diabetes mellitus in hypertensive patients at primary health centres in Surabaya.

Method: This study designed as a cross-sectional study in which participants were recruited purposively from eight primary health care centres in Surabaya. About 92 participants met the inclusion criteria and agreed to participate in the study. The data were collected using a validated self-administered questionnaire The Australian Type 2 Diabetes Risk Assessment Tool (AUSDRISK).

Result: The results showed that about 92 hypertensive patients participated in this study. The majority of respondents [86 respondents (93.5%)] had a high risk of developing type 2 diabetes in the next five years based on the risk assessment using AUSDRISK questionnaire. The most risk factors found in respondents were age, and waist circumference. The results indicate that the diabetes screening program is crucial for hypertensive patients. A screening program supported with education and treatment management is advisable, particularly to those with a high risk of diabetes mellitus..

Conclusion: In conclusion, the hypertensive patient showed a high risk for developing diabetes mellitus in the next five years. The role of pharmacists is needed to promote the health promotion program through the screening program in the community in order to reduce the risk of developing diabetes mellitus in a high-risk population.

Keywords: *Type 2 diabetes mellitus, hypertension, screening, The Australian Type 2 Diabetes Risk Assessment Tool*

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CP-23

The correlation between self-related adherence, asthma-related quality of life and asthma control in adult patients

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Abstract

Background: Medication non-adherence mostly occurs in patients with a wide range of disease severities, including asthma. The study aimed to assess the self-reported adherence to asthma treatment and to investigate the relationship between adherence, asthma control and asthma-related quality of life.

Methods: The study was a cross-sectional study in which participants were recruited at the outpatient department, in one hospital in Surabaya. Patients (aged ≥ 18 years) with asthma who had used any regular asthma medications were included. The standardised questionnaires, including Juniper's Asthma Control Questionnaire (ACQ), Adherence to Refills and Medications Scales (ARMS) and Juniper's Asthma Quality of Life Questionnaire (AQLQ) were used.

Results: A total of 82 adults with asthma were recruited in the study. Male participants' mean age was 49.13 ± 14.10 years ($n=23$). About 59 (72.0%) of participants were females, 30 (36.5%) participants were using Budesonide inhaler, and 73 (89.0%) never smoked. The mean of ACQ, AQLQ and ARMS scores were 1.62 ± 1.19 , 4.96 ± 1.24 and 16.98 ± 4.12 , respectively. Out of 82 patients studied, 53 (64.6%) had "not well- controlled asthma", and more than 85% participants both showed "non-adherence" to asthma therapy and nearly 46% of them showed that their quality of life was affected by asthma. There was a significant association between ACQ and AQLQ ($p<0.05$), whereas no statistically significant association was found between ACQ and ARMS.

Conclusion: The majority of patients at reported non-adherence on asthma medication use. Poor asthma controlled was associated with lower asthma-related quality of life.

Keywords: *asthma, asthma control, quality of life, adherence*

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CP-24

Evaluation of Antibiotics Utilization on Pediatric Inpatients in H. Adam Malik Hospital Medan

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Abstract

Background: Infectious disease remains one of the important public health issues, particularly in developing countries. Although the use of antibiotic applies to all ages, antibiotic for pediatric needs special attention. The fact, antibiotic prescribed for pediatric in Indonesia still commonly found (~90%). The indiscriminate use of antibiotics in pediatric will increase the risk of infection, such as eliminating the good bacteria in the body, damaging the imperfect organs, and cause mutation that will lead to antibiotic resistance so antibiotics become less effective in treating. The use of antibiotic for pediatric adjusted to ideal weight according to age and instructions from professional guidance. Antibiotics were prescribed without investigation on empirical basis with an average of 2.11 per prescriptions. Cefixime was leading antibiotic prescribed followed by cefotaxime. Among the parental antibiotic, ceftriaxone followed by cefotaxime was prescribed in a highest number of patients. Orally administrated drugs contributed the highest proportion of drugs prescribed with 78.16% of total drugs. Antibiotics use was found to be reasonable and rational in most of the cases. The aim of this study was to determine antibiotics prescribing profile for pediatric inpatient in H. Adam Malik hospital Medan, Indonesia in 2019.

Methods: This study was using a retrospective cross-sectional method study which conducted from July- August 2020 with data from June to December 2019. From H. Adam Malik hospital Medan, there were 325 medical records contained antibiotic that made as sample.

Results: The antibiotic that mostly prescribed for pediatric inpatients was cephalosporin for 325 medical records (47%) which was ceftriaxone. There were 270 (60%) of the 453 total of antibiotics used which mismatch duration. There were 39 (8.61%) of the 453 total of antibiotics used with mismatch dose and the most dosage form was injection 211 (47%).

Conclusion: It shows that ceftriaxone was the most prescribed antibiotic for pediatric inpatients in H. Adam Malik hospital Medan and there is still mismatch in dose and duration of use in antibiotic prescribing for pediatric. Prescribers should improve prescribing practices and make it more rational.

Keywords: *Evaluation, antibiotic, utilization, pediatric inpatient, retrospective cross*

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CP-25

MONITORING SERUM CREATININE, BLOOD UREA NITROGEN IN PATIENTS BRAIN INJURY WITH MANNITOL THERAPY

(The study was conducted at the Dr. Soetomo Hospital Surabaya, Indonesia)

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Abstract

Background: Increased intracranial pressure is a further effect of brain injury due to structural damage and osmotic and water imbalances (Edema). Mannitol works in the proximal tubules and mannitol in the absorption of tubular cells by the mechanism of pinocytosis. The fluid transfer will draw fluid into the intracellular, so that the cell will be switched and broke. This phenomenon is referred to as the phenomenon of "Nephrosis Osmotic", in which mannitol administration may occur as a result of accumulation of drugs in the kidneys due to prolonged exposure to mannitol in the kidney and given dosage. The effects of osmotic diuresis occurring plus the dose and duration of mannitol administration are reported to cause renal function disorders (Scr and BUN).

Methods: This study retrospectively evaluated 32 patients who received mannitol infusion between 1 January 2014 and December 2016 in the dr. Soetomo Hospital.

Results: The results of the study the number of patients who met the inclusion criteria, 32 patients. Serum creatinine, the initial average of 0.85 ± 0.17 mg / dl and the last day of the mean SCr 0.74 ± 0.30 mg / dl. While the mean BUN (Blood Urea Nitrogen) was 11.27 ± 2.75 mg / dl and the mean last day was 17.08 mg / dl \pm 8.59 mg / dl.

Conclusion: Mannitol 20% with a loading dose of 200 ml followed tapering ranging from 6x100 ml dose From Serum Creatinine and BUN data it can be concluded that there is no significant change.

Keywords: Mannitol, Acute kidney Injury, Creatinine Serum, Blood Urea Nitrogen

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CP-26

EARLY DETECTION OF ELEVATED LIVER FUNCTION TEST IN TB DRUG RESISTANT WITH SHORT TERM THERAPY AND INDIVIDUAL THERAPY

(The research was carried out at MDR TB Outpatient Clinic at Dr. Soetomo Hospital Surabaya)

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Abstract

Background: Tuberculosis (TB) treatment consists of more than one drug to achieve goal treatment. Drug-resistant Tuberculosis treatment is more challenging than Tuberculosis standard because more than one drug got resistant and so had a great potency appear side effects/ Side effects that arise not only cause mortality and morbidity but also cause the cessation of treatment with the result of not achieving a cure, even occurring drug resistance. Hepatotoxicity is a form of side effect that causes the termination of TB treatment or regimen changes due to treatment failure, relapse, and drug resistance. Hepatotoxicity may increase the problem, covering more than 7% of all side effects. DILI is also one of the concerns in the treatment of TB. Several risk factors such as age, sex, and lifestyle for hepatotoxicity were suggested in previous studies, but in the fact, those are often not related to the incidence of hepatotoxicity during TB treatment.

Objective: To assess the role of risk factor in the hepatotoxicity during drug-resistant TB treatment and investigate the time of onset hepatotoxicity during drug-resistant TB treatment.

Method: The research method is a retrospective study. We identified consecutive patients who developed hepatotoxicity while on treatment for active Tuberculosis. Comprehensive demographic and clinical data, management, and outcome were recorded. Patients who were treated with drug-resistant treatment in Dr. Soetomo General Hospital between January 2018 and January 2020 were enrolled. The statistical method used SPSS ver 16.0.

Results: A total sample of 129 patients met the inclusion and exclusion criteria. The results showed that the prevalence of hepatotoxic side effects was 54 cases. A total of 2 patients occurred hepatotoxicity in the first 2 weeks, and 52 patients developed hepatotoxicity in the late 2 weeks. The results show that there was one risk factor influencing the hepatotoxic side effects of drug-resistant Tuberculosis treatment. The history of alcohol consumption the only one risk factor (OR=3,182; 95% CI=0,120-9,927)

Conclusions: Hepatotoxicity is a common problem among patients during Antituberculosis Treatment, especially on drug-resistant Tuberculosis in our population. Early detection not only reduces the risk of developing hepatic injury but also prevents mortality.

Keywords: *Hepatotoxic, DIH, Adverse Effect, TB MDR, Drug-Resistant, Onset*

CP-27

Management Analysis Side Effects of Elevated Liver Function Test in Tb Drug Resistant With Short Term Therapy And Individual Therapy

(The research was carried out at MDR TB Outpatient Clinic at Dr. Soetomo Hospital Surabaya)

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Abstract

Background: Anti-Tuberculosis Drugs are one of the most common groups of hepatotoxicity causes worldwide. Globally, hepatotoxicity would occur when TB therapy accounts for more than 7% of all side effects. Several risk factors for the development of hepatotoxicities such as age, sex, body mass index (BMI), and acetylation status have been investigated in previous studies. The Ministry of Health issued guidelines for the management of drug-resistant TB in which there is the management of hepatotoxic events. And so, yearly evaluated its guideline especially in the management of hepatotoxic events after antituberculosis treatment.

Objective: To observe seeing the accuracy of management carried out when side effects occur in Drug-Resistant TB therapy with short-term and individual regimens

Method: The research method is a retrospective study. A total sample of 129 patients met the inclusion and exclusion criteria in Dr. Soetomo General Hospital, Surabaya, Indonesia. Patients with HIV and historical liver injury excluded. In this study, patients with Drug-resistant Tuberculosis after antituberculosis treatment used isoniazid, pirazinamid, ethionamide, and fluoroquinolone being our samples. Clinical parameters and liver function test were SGOT and SGPT.

Results: The results showed that the prevalence of hepatotoxic side effects was 54 cases. During treatment in both the short-term and individual regimens, there were 40 patients (74.07%) had stage 1 hepatotoxic, the second was 11 patients (20,37%) in stage 2 and three patients (5.55%) in stage 3. No life-threatening patients.

Conclusions: Management carried out to overcome these side effects is in accordance with the Ministry of Health's guidelines on Drug-Resistant TB.

Keywords: *Hepatotoxic, DIH, Adverse Effect, TB MDR, Drug-Resistant*

CP-28

Drug related problems of antibiotic use in gastroenteritis related to patient therapy outcome at Universitas Gadjah Mada Hospital

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Abstract

Background: Gastroenteritis is a common digestive system disease in community. Some cases of gastroenteritis are caused by bacteria, so the therapeutic management uses antibiotics. Inappropriate use of antibiotics can be associated to Drug-Related Problems (DRPs). The aims of this study are to identify patterns of potential DRPs of antibiotic use and analyze the effect of potential DRPs of antibiotic use toward therapeutic outcomes and length of stay of patients.

Methods: This study was included a cross sectional study retrospectively using patient medical record. The study population was gastroenteritis patients in inpatient ward Universitas Gadjah Mada Hospital for January 2018 - June 2019. Data were analyzed analytically using SPSS. The effect of potential DRPs toward therapeutic outcomes was analyzed by the chi-square method.

Results: Cases of potential DRPs for antibiotic use at Universitas Gadjah Mada Hospital were 133 out of 191 patients (69.6%). The most potential types of DRPs were problems related to drug selection in 98 of 139 DRPs cases (70.5%). Based on the chi-square analysis between potential DRPs and the outcome of antibiotic therapy, the p-value was 0.204. Meanwhile, based on the DRPs chi-square analysis of potential use of antibiotics and length of stay of patients, the p-value was 0.235.

Conclusion: Hence, the potential DRPs for using antibiotics do not have a significant effect on the outcome therapy and length of stay of gastroenteritis patients.

Keywords: gastroenteritis, DRPs, antibiotic, Universitas Gadjah Mada Hospital Corresponding

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CP-29

Knowledge, Attitudes and Practices Regarding Disposal of Unwanted Medications Among Housewives in Surabaya

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ABSTRACT

Background: Medication waste may contains hazardous and toxic materials that pollute the environment when it is not appropriately handled. Most medicine disposals are coming from the household. Therefore a housewife plays a crucial essential role in the drug disposal process. This study aimed to identify the knowledge, attitudes, and practices of homemakers regarding disposal of unwanted medications and investigate the correlation between variables.

Method: This research was designed as a cross-sectional study with involved homemakers in Surabaya as study participants. Participants were chosen purposively based on the inclusion criterias. The data were collected using a validated questionnaire that was developed based on the kinds of literature. About 128 housewives in Surabaya agreed to participate in this study.

Result: The results showed that the majority of participants had sufficient knowledge (50,8%), had a good attitude (84.4%) and had quite good practices (41.4%). The correlation analysis showed that there was a significant correlation between attitude with practice variables ($p < 0,05$). No correlations were found between demographic characteristics (age, levels of education and occupation) and knowledge, attitude and practices variables ($p > 0.05$).

Conclusion: The medication use among households in Surabaya is relatively high. Although the majority of housewives in Surabaya had good knowledge, attitude and practice about drug disposal, more research is needed about the condition in other demographic areas in Indonesia.

Keywords: *Attitude, drug disposal, housewives, unwanted medications, knowledge, practices*

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CP-30

Effectiveness Of Citicoline in Pediatric Patients With Refractive Amblyopia

(Study Conducted at Surabaya Eye Clinic)

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Abstract

Background: Amblyopia is a decrease of visual acuity that cannot be attributed to any structural abnormality of the eye or visual system, causing a partial or complete loss of vision due to inadequate stimulation in early life. The early detection may lead to increased effectiveness of amblyopia therapy at an early age. Refractive amblyopia can be treated by prescribing refractive glasses alone to correct any refractive error. The prescription refractive glasses can be followed by pharmacological therapy for further treatment. Citicoline has been reported to improve visual acuity in amblyopic eyes as adjuvant treatment.

Objectives: This study aims to determine the effectiveness of citicoline in pediatric patients with refractive amblyopia by analyzing visual acuity in early to final treatment recorded in medical records.

Methods: This was a retrospective-descriptive study with a time limited sampling method. This study was conducted at Surabaya Eye Clinic, East Java, Indonesia by reviewing medical records for the period of January 2015 to December 2019.

Results: A total of 17 patients (34 eyes) were the majority aged 5 years (41.2%) and 6 years (35.3%). The severity of amblyopia varied among patients, 21 eyes (61.76%) had mild amblyopia, 7 eyes (20.59%) had moderate amblyopia, and 2 eyes (5.88%) had severe amblyopia. The duration of given therapy also varied, 18 eyes (52.94%) were given 3 months therapy, 2 eyes were given 4 months therapy, 12 eyes were given 6 months therapy, and 2 eyes were given 8 months therapy.

Conclusion: Citicoline therapy resulted in a clinically and significant improvement in visual acuity based on the severity of refractive amblyopia and the duration of citicoline therapy factors.

Keywords: *Citicoline, Pediatric, Amblyopia, Refractive Error*

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CP-31

Appropriate Empirical Antibiotic Treatment and Vital Sign Outcome among Pneumonia Patients in Universitas Gadjah Mada Academic Hospital, Indonesia

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Abstract

Background: Pneumonia is defined as a common illness that remains to be the highest mortality rate in young children and the elderly-aged group in both of developed and developing countries. Pneumonia itself counted as the second out of the ten most common diseases from January to November 2018 of inpatient care in the Universitas Gadjah Mada Academic Hospital. This study aimed to explore the appropriate usage of empirical antibiotics in hospital guideline of Universitas Gadjah Mada Academic Hospital and to evaluate it's vital sign outcome.

Methods: This study used cross sectional method with retrospective data collection through patients' medical report collected from January to June 2018 and driven descriptively. Specifically, the research's subjects in this study were hospitalized patients which diagnosed with pneumonia. In addition, the evaluation of the appropriate empirical usage of antibiotics based on the 2015s local hospital's guideline on pneumonia treatment that established in Universitas Gadjah Mada academic hospital.

Results: Overall, there are total of 197 patients with Pneumonia or Bronchopneumonia diagnosed which particularly consisted of 98 children's patients and 97 adults. The highest prevalence of antibiotic treatment in academic hospital were using empirical antibiotic which is betalactam-penicillin antibiotic group for pediatric patients and betalactam-cephalosporin antibiotic group for adult patients diagnosed with pneumonia. Moreover, the abnormality of patient's vital signs after the 48 until 72 hours duration of treatment were decrease remarkably. Regarding to the appropriate use of antibiotic treatment which observed in children was reported low roughly around 0.071%, meanwhile in adults almost a half of observed patients were appropriated.

Conclusion: Through this pioneer study the hospital's guideline on local pneumonia treatment should re- evaluate in order to improve the appropriate empirical usage of antibiotics.

Keywords: *pneumonia, local hospital guidelines, appropriate empirical use of antibiotic, Universitas Gadjah Mada Academic Hospital*

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CP-32

Abuse of drugs and psychoactive substances amongst undergraduate university students

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Abstract

Background: Drug and psychoactive substances abuse among university students is of public health concern and is becoming a global threat to the education system. The present study aims to assess the prevalence and impacts of psychoactive substance abuse among university undergraduates in Katsina state, Nigeria.

Methods: A cross-sectional study was conducted using online survey tool (Google Form™). The questionnaire was validated by panel of expert in the field followed by a pilot study. The hyperlink to the online survey tool was shared with undergraduate students from three universities located in Katsina state, Nigeria via emails and social media namely; WhatsApp, Facebook, and Twitter. Data collected from eligible participants was analysed using descriptive statistic.

Results: A total of 308 students returned the online questionnaire of which 207 (67.2%) were males and 101 (32.8%) females. Majority of them are third year students in the age range of 20-25 years (56.2%), and from a monogamous family 207 (67.20%). Among the respondents, 37% admitted practicing drug and/or psychoactive substance abuse. Majority were introduced to the practice by peer friends 60 (19.50%), and they were initiated prior to admission into university 239 (77.60%). Poor academic performance; 152 (49.40%) ($p=0.001$), has been associated with the abusers.

Conclusions: Drug and psychoactive substance abuse among the undergraduate university students in Katsina state, Nigeria is common, and it cut across both males and females. Most commonly abused drugs are cough syrups, codeine, and sleeping pills. While tobacco, cannabis, coffee and stimulants are the most commonly abused psychoactive substances. Poor lecture attendance and pitiable academic performance are among the consequences of the menace.

Keywords: *drug, psychoactive substance, abuse, undergraduate students, Katsina state, Nigeria*

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CP-33

Translation and Validation of the Indonesian Version AQoL-4D Questionnaire to Measure the Quality of Life of Patients with Chronic Diseases

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Abstract

Background: Chronic conditions often result in a person experiencing both physical and mental disorders which limit them from carrying out their daily activities and will further affect the patient's quality of life. Generic tools are tools that can be used for all conditions and levels of disease, while special tools are tools used for patients with certain diseases. The AQoL-4D is a generic quality of life instrument that can be used for all conditions and levels of disease. This study aims to determine the validity and reliability of the Indonesian AQoL-4D instrument in chronic disease patients at health centers in Surabaya.

Methods: The language transfer process was carried out according to WHO guidelines for translating and adapting English Language Instruments. Validation and reliability of the Indonesian version of AQoL-4D was carried out on 142 chronic disease patients, and then the data were analyzed statistically to test the consistency between the components of the construct and others.

Results: The results of the construct validity test obtained r-count range from 0.347 to 0.595 which are greater than r-table ($\alpha = 0.05$; $df = 140$) of 0.166, so it can be said that the measurement results of each component of the AQoL-4D questionnaire are correlated respectively. Even though the reliability test results have a moderate Cronbach value of 0.669 this instrument is considered adequate reliable.

Conclusion: The Indonesian version of AQoL-4D instrument is valid and reliable for measuring the quality of life of patients with various levels and conditions of chronic disease.

Keywords: *Validation, questionnaire, quality of life, chronic disease, AQoL-4D*

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CP-34

Adherence to pharmacological therapy and non-pharmacological therapy in hypertensive patients

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Abstract

Background: Hypertension is a chronic disease that requires long term therapy, therefore adherence to pharmacological therapy and non-pharmacological therapy are important to optimize outcome therapy.

Objective: This study aimed to determine the profile of pharmacological therapy adherence and non-pharmacological therapy adherence of hypertensive patients.

Method: This study is a descriptive study with non-random and 116 hypertensive patients from a Community Health Center, located at West Surabaya. Adherence measurement was performed by using three methods: ARMS questionnaire, pill-count, and lifestyle questionnaire.

Result: The result of ARMS indicated that the majority of respondents, 92.2% (n = 116), had moderate levels of adherence while the rest, 7.8% (n = 116) had a high level of adherence. Meanwhile, the results of measurement of adherence to treatment by pill-count method showed that more than 50 percent of respondents (57.8%, n = 116) adhered to the therapeutic regimen and the rest (42.2%, n = 116) were not compliant. Patient adherence to non-pharmacological therapy measured by lifestyle questionnaire showed that the majority of respondents, 94% (n=116) had a moderate level of adherence while the rest had a high and low level of adherence respectively 5.2% and 0.8%.

Conclusion: The results of measuring the pharmacological adherence of therapy with the ARMS questionnaire showed moderate adherence and measurement by pill count showed that only 50 percent of respondents were adherent. Meanwhile, for adherence to non-pharmacological therapy, the majority of respondents had moderate adherence.

Keywords: *adherence, an antihypertensive drug, hypertensive patient, ARMS, lifestyle, pill count*

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CP-35

Challenges in the provision of natural products by community pharmacists in East Java Province, Indonesia

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Abstract

Background: Community pharmacist has been widely known as a health professional who can be easily accessed to provide medicines and reliable medicine information. However, this was not always in the case of dispensing natural products. Several international studies revealed that community pharmacists were less likely to deliver natural products accompanied with detailed information. Therefore, this study aimed to investigate factors influencing Indonesian community pharmacists in the supply, delivery of, and provision of information about natural products.

Methods: A qualitative study with purposively selected community pharmacists in four areas (district or municipality) in East Java was designed. In-depth, semi-structured interviewed were conducted using a Capability-Opportunity-Motivation-Behaviour approach. All interviews were audio-recorded, transcribed *ad verbatim*, and thematically analysed.

Results: Data saturation were reached after interviewing 14 community pharmacists. All informants reported dispensing non-prescribed natural products. Nine informants had experienced dispensing prescribed natural products, mainly based on pediatricians' requests. The most common information given was about product usage, while information about safety (i.e. side effects, interaction) was rarely provided. Although numerous registered natural products have been available, informants had low motivation to supply a variety of types, primarily because little opportunity to receive requests from doctors and the community. Limited capability due to a lack reliable source of information about natural products was another reason.

Conclusion: Poor motivation to supply natural products was because community pharmacists had little opportunity for such requests and limited capability due to scarcity of information. This indicated support from natural product manufacturers, researchers, and the government is highly required.

Keywords: *natural product, community pharmacy, information*

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CP-36

Drug utilization study and cost analysis of adult β -thalassemia mayor patient therapy at dr. soetomo general hospital surabaya

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Abstract

Background: Arising problems due to periodic transfusion in β -thalassemia major patients are iron overload, transfusion reactions, and nutritional deficiencies. On the other hand, patient compliance problems also arise due to long-term use of iron chelation. Problems that occur during *thaler's* treatment also have impact on therapy cost. This study was designed to analyze drug utilization study and cost of therapy in β -thalassemia major adult patients at Dr. Soetomo General Hospital Surabaya.

Methods: This research was conducted in descriptive observational-retrospective design using secondary data obtained from patient's medical records and billing registrations during January 1-December 31 2019.

Results: There were 18 patients out of 233 patients that were analyzed. Deferasirox (DFX) was the most administered drug with ranged doses between 500 mg/day-1500 mg/day while deferiprone (DFP) was ranged between 1500-4500 mg/day. Patients also received transfusion reaction drugs with dexamethasone injection 5 mg/mL which was administered the most. The most administered supplement was folic acid 1 mg. Patients had an increase in serum ferritin due to low compliance. DFX had the most adherence number of patients with decreased of serum ferritin. Two highest cost of direct medical components were top up medicines and consumable medical supplies. Overall the hospital gained profit from INA-CBGs' claim.

Conclusion: The most administered chelating agent was DFX. DFX also had the most adherence number of patients with decreased number of serum ferritin. However, DFX also yielded the highest cost. Yet, overall, the hospital gained profit from INA-CBGs' claim.

Keywords: *drug utilization study, compliance, cost analysis, β -thalassemia major*

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CP-37

The Correlation of Iodine Intake with *Thyroid Stimulating Hormone* (TSH) Level and Free *Thyroxine* (FT4) on Hyperthyroid Patients

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Abstract

Background: Hyperthyroid is defined as a clinical syndrome characterized by hypermetabolism as a result of increased Thyroxin (T4) and Triiodothyronine (T3). The increase of Free Thyroxine (FT4) and Free Triiodothyronine (FT3) will lead to an emphasis on Thyroid-Stimulating Hormone (TSH). In Indonesia, the prevalence of hyperthyroid cases based on the Riset Kesehatan Dasar in 2013 was 0.4%. Iodine is a nutrient that plays a significant role in forming Thyroxin (T4, prohormone) and Triiodothyronine (T3, active hormone) as the element in forming thyroid hormone in follicular cells. Therefore, sufficient Iodine is indispensable in maintaining a healthy thyroid function. This study aims to analyze the correlation of Iodine intake with TSH level and FT4 on *Hyperthyroid* Patients.

Methods: This study was an analytic observational using the cross-sectional design on 50 *Hyperthyroid* Patients in Balai Litbang Kesehatan Megalang chosen based on inclusion and exclusion criteria. The intake data gained by recall 2x24 hours while TSH and FT4 data were obtained from laboratory testing at Balai Litbang Kesehatan Megalang. These data were analyzed using the spearman correlation test.

Result: The average of Iodine intake was 593.13 mg, and the average of TSH and FT4 was 0,26 μ IU/mL and 2,61 ng/dL, respectively. The result showed a significant correlation of Iodine intake with TSH on *Hyperthyroid* Patients ($p < 0.05$), whereas no significant correlation on Iodine intake with FT4 ($p = 0,319$).

Conclusion: Excess iodine intake is associated with TSH but not FT4 level on *Hyperthyroid* Patients

Keywords: FT4, *Hyperthyroid*, Iodine Intake, TSH

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CP-38

Understanding adverse drug-related emergency department visits: development of a conceptual model through a systematic review

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Abstract

Background: The burden of adverse drug event (ADE)-related emergency department (ED) visits is increasing despite several preventive measures. The objective of this paper was to develop and validate a conceptual model for a better understanding of ADE-related ED visits and to guide the design and implementation of effective interventions.

Methods: The development of the model involved a systematic review of the literature using PubMed and Embase databases. Studies reporting the risk factors associated with ADE-related ED visits were included. The methodological qualities of the included studies were assessed using the Mixed Methods Appraisal Tool (MMAT). The model was mapped and validated using face and content validity by an expert panel. Deficiencies and targeted interventions were identified, and steps for the design and implementation were recommended.

Results: The literature search generated 1361 articles, of which 38 were included in the review; 41 risk factors associated with ADE-related ED visits were identified. All factors were mapped, and the model was validated through face and content validity. The model consisted of six concepts related to sociodemographic factors, clinical factors, ADE-related to ED visits, ADE while in the ED, outcomes, and consequences. Interventions could be targeted at the factors identified in each concept to prevent ADE-related ED burden.

Conclusion: A conceptual model to guide the successful design and implementation of strategies to prevent ADE-related ED visits and the occurrence of ADE at ED was developed. Clinicians should take these factors into consideration to prevent untoward events, especially when treating high-risk patients.

Keywords: *adverse drug events, drug-related problem, emergency department, pharmacoepidemiology*

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CP-39

Profile of Knowledge, Attitude, and Practice Disposal of Wasted Medications by Caregiver in Nursing Homes in Surabaya

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Abstract

Background: Nursing homes have a large number of drugs, thus need to have good management of medication including good disposal management of wasted medications. Many studies have suggested that improper disposal of wasted medications has been effected for environments, humans or animals. Caregivers knowledge, attitude, and practice of wasted medications disposal are important to prevent negative impacts because of poor medication disposal. This study aimed find out how the profile and correlation of knowledge, attitudes, and practices of wasted medications disposal by caregivers.

Methods: This research was a survey based, cross-sectional study. Respondents were selected based on inclusion criteria. About 33 respondents agreed to participate this study. Data were collected using a questionnaire filled out by respondents. Before data collection, a pilot study was conducted.

Results: Wasted medications were mostly from doctor's prescriptions and the most dosage forms were tablets. There were 17 respondents (51.51%) who categorized less knowledge and there were no caregivers included in having good knowledge category. More than a half of respondents (21 persons or 63.64%) had a good attitude, 12 respondents (36.36%) were included in the sufficient category, and no caregivers included in poor attitude category. Related to practice profile, 10 respondents (30.30%) had good practice, 21 respondents (63.64%) had sufficient practice, and 2 respondents (6.06 %) had poor practice. The statistical analysis indicated that knowledge had a significant relationship with the attitudes and practices ($p < 0.05$).

Conclusion: Disposal of wasted medications properly is still neglected in nursing homes in Surabaya.

Keywords: *disposal of wasted medications, nursing homes, caregiver, knowledge, attitude, practice.*

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CP-40

Analysis of Matrix Metalloproteinase-9 Levels in Patient of Acute Heart Failure with ACE Inhibitors Therapy

(Study at RSUD Dr. Soetomo Surabaya)

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Abstract

Background: Heart failure caused by declining of heart ability to circulate blood, which lead to compensation mechanism. In heart failure, mechanical stretch of myocardium is increased, resulted from neurohormonal activation. MMP-9 is a biomarker of heart failure with myocardial fibrosis. MMP-9 related to inflammation, diabetic microvascular complication, and cardiac dysfunction, eventually leads to *cardiac remodelling*. ACE inhibitors is recommended for heart failure, prevent *remodelling* using several mechanisms.

Objectives: This study was aimed to analyzed the effect of ACE inhibitors therapy on MMP-9 level, as a cardiac marker, on impatients with heart failure.

Methods: This was an observational prospective study *one group pretest-posttest* design. 23 patients were collected using nonrandom sampling. MMP-9 were measured before and after therapy with ACE inhibitors. Ethical Committe of RSUD Dr.Soetomo approved this study. MMP-9 level were examined using ELISA, and statistically processed using Wilcoxon test to compare MMP-9 pre and postlevel.

Result: There are 23 patients met the inclusion criteria of the study (15 males and 8 females). ACE inhibitors used in patients were Captopril (9%), Lisinopril (26%) and Ramipril (65%). MMP-9 level before ACE inhibitors therapy was 915.26 ± 260.84 and MMP-9 levels after therapy was 1916.95 ± 383.12 . There were 8 patients (65%) have decrease > 15%. The mean percentage change of MMP-9 was 15%. Analyzed statistic of MMP-9 level were statistically not significant ($p=0,378$).

Conclusion: There was a not significant decrease in MMP-9 level pre and post.

Keywords: MMP-9, Heart Failure, ACE inhibitors

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CP-41

ANALYSIS OF THE EFFECTIVENESS/SUCCESSFUL AND SAFETY OF FIBRINOLYTIC THERAPY IN PATIENT WITH ACUTE STEMI (ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION)

(Study at RSUD Tarakan North Kalimantan)

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Abstract

Background : Acute coronary syndrome (ACS) is a condition that occurs when there is a blockage of blood flow to the heart. STEMI (ST Elevation Myocardial Infarct) is one form of ACS. Fibrinolytic therapy is recommended by ACC/AHA and PERKI in STEMI when Percutaneous Coronary Intervention (PCI) cannot be performed.

Objectives: This study aims to determine the effectiveness or successful of fibrinolytic therapy in patients with STEMI in RSUD Tarakan North Kalimantan in terms of chest pain reduction, ST segment resolution $\geq 50\%$, and the presence of reperfusion arrhythmias. This study also identified the safety of fibrinolytic therapy in terms of bleeding occurrences, hypotension and allergic reaction.

Methods: This was an observational retrospective study with a total sampling method, which was conducted at Tarakan District Hospital in North Kalimantan Province. A review of medical record of the patients was conducted for the period of January 2016 until Desember 2018

Result: Samples that met the inclusion criteria were 55 patients. There were 2 fibrinolytic use namely alteplase and streptokinase. Alteplase was given to 13 patients while streptokinase was given to 42 patients. Almost all patients experienced a decrease in pain scale (49 patients or 89.1%), 42 patients (76.4%) experienced ST segment resolution, and 23 patients (41.8%) experienced reperfusion arrhythmias. Based on these 3 parameters it was found that on average 80% of patients experienced successful reperfusion. None of the patients had major bleeding. The fibrinolytic therapy is safe while in use with only 8 patients had minor bleeding, 14 had hypotension and 3 patients had allergies.

Conclusion: The success of fibrinolytic therapy in Tarakan District Hospital in North Kalimantan Province is 80%. Safety is not a concern since only minor adverse events was found.

Keywords: STEMI, Fibrinolytic, Effectiveness and Safety, Tarakan District Hospital North Kalimantan

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CP-42

Assessment of patient understanding of their conventional cardiac medicines and herbal prepared/derived products: interviews with selected community dwelling elderly patients in the Philippines

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Abstract

Background: Associated illnesses and its complications need appropriate management; hence the patient may be exposed to polypharmacy, adverse drug reaction (ADR) and drug-related problem (DRP). Structured patient's decision-making on his/her medication intake must be evaluated to identify the possible gap in medication knowledge, medication adherence, and identification of DRP and polypharmacy as well.

Methods: The purpose of the study is to identify the patterns of medication load, its medication burden, coordination of healthcare and patient's understanding of their conventional cardiac medications and related herbal-derived preparations. The study involved Filipino elderly patients (n = 69) from the different areas of Metro Manila, Rizal and Cavite. The researchers gathered data through face-to-face interviews using a semi-structured questionnaire. Descriptive statistics was utilized during data analysis. Thematic analysis was used to emphasize patterns in the responses of the participants.

Results: Selected Filipino elderly patients were knowledgeable on the name (86.9%), visual characteristics (78.3 %) and indication and administration of their medicine (88.4 %). An equal number of participants who responded on how frequent their doctors informed them on the possible side effects of the medicines they were taking and an almost negligible difference on the proportions of those who asserted when their doctors asked about the side effects of their medications (<10.5%). Association on the age of the respondents and awareness of any interaction on the drugs they are taking were noted ($p = 0.032$) and an association between the gender and awareness of the doctor/pharmacists about other drugs the patient is taking ($p = 0.033$).

Conclusion: Majority of the selected elderly patients recognized the purpose of medication. Supervision by the healthcare professionals must be fully established. It was noted that pharmacists play a minimal role in the understanding of Filipino elderly patients on their medication due to lack of communication between the patient and the pharmacist. Respondents were not yet informed of the responsibility of the pharmacist to provide information regarding their medication. Integration of pharmacists' care for the geriatric health must be strengthened.

Keywords: *elderly, medication intake, medication burden, cardiac medicines*

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CP-43

Impact of Empirical Antibiotics' Appropriate Use on Patients' Outcome Therapy Among UTI Patients At The Inpatient Ward UGM Academic Hospital

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Abstract

Background: Urinary Tract Infection (UTI) has a high prevalence in Indonesia. This study was conducted to determine the impact of empirical antibiotics' appropriate use on outcome therapy of patients with UTIs at the inpatient ward UGM Academic Hospital.

Methods: This study was cross-sectional with retrospective data collection through patients' medical records. The population was all patients who got empirical antibiotic therapy for UTI at the inpatient ward in July 2018- July 2019. Subjects collected with purposive sampling. The appropriate application of empirical antibiotics, including the right type, dosage, route, duration, and frequency, were evaluated according to Antibiotic Guidelines of UGM Academic Hospital 2018, IDAI, Drug Information Handbook, UGM Academic Hospital Clinical Practice Guidelines 2015, and Pharmacotherapy Self-Assessment Program 2018. Data collected then analyzed descriptively.

Results: The result showed that among 196 patients included in this study, antibiotics were appropriately used according to the type, route, dose, frequency, and duration as many as 45,9%, and 41,8% of them have improvements in outcomes therapy. Other than that, 54.1% of patients were using antibiotics not according to guidelines, and 48,0% of them still have improvements in outcomes therapy. Based on the Chi-Square Test, the p-value was >0,05 (0,64), concluded that there is no significant relationship between the accuracy of empirical antibiotic application with outcomes therapy.

Conclusion: Thus, the application of empirical antibiotics following the guidelines does not always impact improving treatment outcomes for UTI patients in the UGM Academic Hospital inpatient ward.

Keywords: *Antibiotics evaluation, urinary tract infection, suitability, inpatient ward, Indonesia*

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CP-44

Perceived depressive symptoms: prevalence and association with new york heart association classes of heart failure outpatients in a public hospital in Malaysia

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Abstract

Background: Depression commonly affects heart failure patients, leading to negative clinical outcomes. Findings from previous studies suggested the importance of detecting depressive symptoms among heart failure patients and its association with disease state. However, relevant local studies were limited. This study aimed to determine the prevalence of perceived depressive symptoms among heart failure outpatients and its association with New York Heart Association (NYHA) class.

Methods: This was a cross-sectional study. A total of 177 heart failure outpatients were sampled at Medication Therapy Adherence Clinic (Heart Failure) in Hospital Pulau Pinang (HPP) from Jan 2020 to Mar 2020 using convenience sampling method. Patients under 18 years old, pregnancy, patients with psychiatric or depressive disorders and inpatients were excluded. A validated Patient-Health questionnaire-9 (PHQ-9) was used for screening of depressive symptoms. High scorers (≥ 10) were regarded as depressive. Results were reported in percentage (%) or median \pm interquartile range (IQR). Chi square test with 95% confidence interval and Spearman correlation were used.

Results: The prevalence of perceived depressive symptoms among heart failure outpatients in HPP was 14.1%. NYHA class and left ventricular ejection fraction (LVEF) were significantly and positively correlated with depressive symptoms scores ($r_s = 0.255$, $p = 0.001$; $r_s = 0.193$, $p = 0.010$ respectively).

Conclusion: Depressive symptoms were perceivably common among heart failure outpatients. Higher NYHA class and higher LVEF suggested higher depressive symptoms score. Screening for perceived depression especially patients with higher NYHA class was recommended. Nevertheless, cost effectiveness study should be performed for justification.

Keywords: *heart failure; congestive heart failure; depressive symptoms; depression; New York Heart Association; cross-sectional study*

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CP-45

Drug utilization of antipsychotics: a 1-year cross sectional study at the national mental hospital in Indonesia

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Abstract

Background: The utilization pattern of psychotropic drugs has undergone major changes since the introduction of atypical antipsychotics. Currently, medication for patient with schizophrenia predominantly used Second Generation Antipsychotics (SGAs) than the First Generation Antipsychotics (FGAs). However, both antipsychotics were still being used for treating a variety of indications making it difficult to select particular antipsychotics on a rational basis. This study therefore aimed to present the most updated utilization pattern of antipsychotics among Indonesian.

Method: A retrospective cross-sectional drug utilization study was conducted in 2019 collecting one year data on medication used by inpatients and outpatients at National Mental Hospital in Indonesia. Data were derived from pharmacy department stock report for one year period. A descriptive analysis was conducted to present the pattern, and the annual total cost for each psychotropic used in the hospital.

Result: The results showed that majority of patients were diagnosed schizophrenia as the most common mental health problem.. FGAs prescriptions accounted for 30% with total cost estimated was IDR 459 million. Trifluoperazine 5 mg was the most commonly FGAs prescribed (56.53%). Eventually, SGAs prescribing was accounted for 39% with total cost was estimated IDR 3.71 billion. Risperidone 2 mg was the most commonly SGAs prescribed (33.23%). Prescribing trends of anticholinergic agents in 2019 were 31% with total cost estimated was IDR 176 million. Trihexyphenidyl 2 mg was the most commonly anticholinergic prescribed (93.70%).

Conclusion: This study proves the common trend of using SGAs in the treatment of schizophrenia. Accordingly, the cost of treatment using SGAs is substantially higher than using FGAs.

Keywords: *antipsychotics, drug utilization study, schizophrenia, cost*

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CP-46

Translation and cross-cultural adaptation of an instrument measuring patient's well-being under treatment for schizophrenia

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Abstract

Background: The Subjective Well-Being Under Neuroleptic (SWN) Scale is a self-rating scale measuring the well-being of patients with schizophrenia under antipsychotic drug treatment. The instrument has been globally used regardless issues pertaining to the assessment of well-being across different cultures, patient's characteristics and country-setting remain controversy. This study aimed to translate and culturally adapt the SWN scale into Indonesian version (Indonesian Modified SWN or IM-SWN) as well as to evaluate the validity and reliability of this instrument.

Method: The SWN instrument was translated and culturally adapted following to internationally accepted procedures including forward translation, expert panel review, backward-translation, pre-testing and cognitive interviewing and psychometric analysis for the final version of the scale. The translated instrument was tested to 108 schizophrenia patients was conducted. The validity and reliability of the instrument were assessed using Pearson's correlation and Cronbach's Alpha coefficient, respectively. Additional analysis for the socio- demographic and psychometric properties of the patient were also conducted.

Result: The range of IM-SWN total score between 30-112. IM-SWN was found to have a high reliability coefficient (0.897) and the internal consistency values of the items varied between 0.885-0.910. The results also showed high correlation between five order factors (Physical functioning, mental functioning, self-control, emotional regulation, and social integration) with the total score is between 0.768-0.885.

Conclusion: This study highlighted that the IM-SWN is a valid and reliable instrument for measuring well-being among Indonesian population.

Keywords: schizophrenia, subjective well-being, antipsychotics, translation, adaptation

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CP-47

The relationship between frequency and preference of coffee type consumption on adults depression level

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Abstract

Background: The development of coffee shops and coffee consumption among Indonesians has increased. Coffee contains many chemical components, including caffeine, chlorogenic acid, trigonelline, carbohydrates, fats, amino acids, organic acids, volatile aromas, and minerals. Caffeine and chlorogenic acid have a fairly high amount in coffee. Caffeine and chlorogenic acid have a mechanism in reducing the metabolic syndrome. Chlorogenic acid influences AMPK phosphorylation, as an anti-inflammatory and antioxidant that has an influence on depression level. However, the frequency and preference of coffee type consumed in order to have an influence on depression levels still need to be investigated.

Methods: A cross-sectional study was conducted involving 110 adults aged 20-29 years old. Consumption of coffee and depression level were assessed using a questionnaire. The data were then analyzed by using multiple regression and Anova.

Results: Frequency of coffee consumption and preference of coffee types has a value of $p < 0.05$. Therefore, frequency and type of coffee preferences have an influence on the level of depression. Most respondents consume a cup of coffee everyday and the most consumed type of coffee is family latte with additional sugar.

Conclusion: Frequency of coffee consumption and preference of coffee types was related to level of depression on adults. Consumption of coffee once a day is possible to reduce levels of depression. Nowadays non sachet milk coffee with added sugar is popular.

Keywords: *Frequency, coffee type preference, depression level*

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CP-48

Adherence to taking asthma therapy prescription drugs in outpatients at Praya Healthcare Center, Central Lombok Regency, Indonesia

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Abstract:

Introduction: Asthma is a history of respiratory symptoms such as shortness of breath, chest tightness and cough that varies in intensity along with variable expiratory airflow usually characterized by chronic airway inflammation. Asthma medication management is carried out to control symptoms and minimize future risks to sufferers. This study aimed to determine patient adherence to taking asthma therapy prescription in outpatients at Praya Public Health Center, Central Lombok Regency, NTB.

Methods: A retrospective study conducted from January to December 2019. Data were collected from outpatient medical records. A descriptive analysis of patient characteristics, asthma medication therapy and adherence was performed. Adherence is defined as a patient coming to Praya Primary Healthcare Center to take asthma medication during 2019 before runs out of drug.

Results: Total visits for asthma patients were 1060 in 2019, consisted of 455 asthma patients. Patients who received reliever therapy was 71.5% (758) and controller therapy was 28.5% (302). Reliever therapy included Ipratropium Bromide + Salbutamol Sulphate Nebulizer (n=143, 18.86%), Aminophylline tablet 200 mg (n=58, 7.65%), Aminophylline injection 24 mg/ml (n=12, 1.58%), Salbutamol tablet 2 mg (n=67, 8.85%), Salbutamol tablet 4 mg (n=478, 63.06%). Controller therapy included Prednisone tablet 5 mg (n=22, 7.28%), Methylprednisolone tablet 4 mg (n=93, 30.79%), Dexamethasone 0.5 tablet mg (n=187, 61.93%). Adherence was 2.41% (n = 11).

Conclusion: Adherence to taking asthma prescription drug before the drug run out in outpatient at Praya Healthcare Center, Central Lombok Regency, Indonesia was low. Future studies may focus on the pharmacist's role in improving adherence to asthma patients.

Keywords: *asthma, controller, reliever, adherence*

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CP-49

The effectiveness of beta blocker in geriatric with heart failure patients

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Abstract

Background: Geriatric patients with heart failure diseases administered with well established current treatment known as beta blocker therapy. The aim of the study is to evaluate the effectiveness of the beta blocker and to identified the most suitable generation of beta blocker in geriatric with heart failure patients. **Methods:** A narrative review study was conducted with collection of data derived from Scopus and Pubmed database using the specific keywords in the year range 1978 to 2020.

Results: Three generations of beta blocker were identified in our studies. The most prescribed by physician is Carvedilol. The geriatrics patients who underwent beta blocker therapy had improvement in percentage of left ventricle ejection fraction, left ventricle end diastolic volume, and left ventricle systolic volume. Beta blocker treatment also showed reduction in heart rate and blood pressure.

Conclusion: These effect of beta blockers agent still effective in improving mortality and reduce hospitalization in geriatric patient with heart failure. However, due to different study design of each study, it is quite difficult to compare the effectiveness of beta blocker in geriatric patients with heart failure among all the centers.

Keywords: *geriatric, beta blocker, heart failure*

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CP-50

Analysis of the Use of Antibiotics Profile and Factors of Surgical Site Infections Study on Digestive and Oncology Surgery

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Abstract

Background: The incision method operation with a high risk of infection in a clean and clean-contaminated operation requires the use of prophylactic antibiotics to minimize the risk of infection.

Objective: This study was designed to analyze the effectiveness of prophylactic antibiotics in patients with digestive and oncology surgery.

Method : The statistical method used was chi-square to determine the risk factors for infection at surgical site infections (SSI) in patients with digestive and oncology surgery. This study has received ethical approval from the Ethics Committee of Dr. H. Slamet Martodirdjo, Pamekasan.

Results: There were 67 patients consisted of 48 digestive surgeries (71.6%) and 19 oncology surgeries (28.4%). observation on day 30 as much as 1 (1.5%) SSI patient experienced purulence, inflammation, erythema around the surgical wound so an analysis of $p > 0.05$ was carried out so that there was no association with the incidence of SSI during hospitalization, but other factors originating from the patient, such as a lack of personal hygiene at home and lack of nutritious food intake were measured in temperature, pulse, and respiration and white blood cells examination before surgery and 24 hours after surgery, all within normal ranges. The qualitative analysis of prophylactic antibiotics using the Gyssen method showed that 31 (46.3%) rationale needed an improvement process.

Conclusion: The widely used prophylactic antibiotics, namely cefazoline and cefuroxime were recommended antibiotics used in incision surgery and rationale used

Keywords: *prophylactic antibiotics, Surgicals, SSI, Gyssens*

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CP-51

The Effect of Education and Pillbox by Pharmacist towards Medication Adherence in Diabetes Mellitus Patient in A Primary Health Care Center in Mataram

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Abstract

Background: Nonadherence with long-term therapy, including diabetes mellitus, is one of the global problems that need to be overcome. This study aims to determine the effect of education and pillbox by pharmacists towards medication adherence in patients with diabetes mellitus in a Primary Health Care Center in Mataram.

Methods: This research is an experimental research design with pretest-posttest with control group design. Study was conducted in October-December 2019 at Tanjung Karang Primary Health Care Center, Mataram. Measurement of adherence was done using the Adherence to Refill and Medication Scale (ARMS) questionnaire. The higher the score, the more nonadherence the patient is. Patients were divided into three groups, which were control group, educational intervention group, and pillbox and educational intervention group. Each group consists of 11 patients.

Results: Patient's medication adherence increased from 19.54 (SD 4.37) to 15.18 (SD 2.64) in the education and pillbox intervention groups ($p = 0.004$). Whereas in the education and control groups, the adherence did not provide a significant change ($p > 0.05$). Based on the difference in adherence scores, it is known that what contributed to changes in compliance was refilling medicine and intentional nonadherence in taking medicine subscale ($p = 0.024$).

Conclusions: Providing education and pillbox by pharmacists at the Primary Health Care Center can increase adherence to the therapy of diabetes mellitus patients. Pharmacists at the Primary Health Care Center can use the intervention model to improve the level of compliance of patients with chronic illness.

Keywords: *adherence, diabetes mellitus, education, pillbox* Corresponding author

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CP-52

Evaluation of antibiotic use in pneumonia treatment of pediatric and geriatric inpatients in Sultan Agung Islamic hospital Semarang

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Abstract

Background: Pneumonia is a lung inflammatory disease where the alveoli swell and there is an occurs fluid accumulation caused most by bacteria. Antibiotic is a first-line drug for pneumonia therapy. The purpose of this study aimed to determine the diference of antibiotic use in the treatment of pneumonia on geriatric and pediatric patients.

Methods: A retrospective design and purposive sampling technique were used to determine its samples. The data were based on the patient's medical record in the Inpatient Installation of Sultan Agung Hospital in Semarang in the period January-December 2018.

Results: There were 80 patients, 22 pediatric and 58 geriatric it that periode. The most antibiotic used in geriatric patients was ceftriaxone and levofloxacin as a single drug and in pediatric patients was cefotaxime as a single drug and in combination with other antibiotics. The length of stay of the pediatric patients was 4.7 ± 1.2 and geriatric patients was 3.8 ± 1.3 The difference between them was significant, $p.0.01$

Conclusion: the antibiotic use in pediatric and geriatric were different

Keywords: *pneumonia, pediatrics, geriatrics, antibiotics, length of stay*

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CP-53

Effect of atorvastatin on CETP (Cholesteryl Ester Transfer Protein) level and lipid profiles in children refractory nephrotic syndrome with hyperlipidemia

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Abstract

Background: Atorvastatin is one of the statin drugs recommended for treating hyperlipidemia in children because it is more potent and safer with minimal drug side effects. Various studies have found the effect of atorvastatin on CETP level, but the results obtained are still controversial.

Objective: To analyze the effect of atorvastatin on CETP level and lipid profiles in children refractory nephrotic syndrome with hyperlipidemia.

Methods: A randomized clinical trial (RCT), double blind, pre and post test control group with treatment given for 4 weeks. There are two groups including the control group (placebo) and the treatment group (atorvastatin). The study was conducted in pediatric nephrological outpatients Dr. Soetomo Surabaya from December 2019 to March 2020. Initial examination was carried out at week 0 ie total cholesterol, LDL, HDL, TG, CETP, and other laboratory tests. After 4 weeks, the examination was retested.

Results: The difference in average total cholesterol and LDL at week 0 and week 4 in the control group and the treatment group was significant ($p < 0.05$). Giving atorvastatin reduced total cholesterol (29.2%), LDL cholesterol (30.8%), TG level (7.5%), and did not yet have an increase in HDL cholesterol levels. The mean CETP level in the treatment group were not significant differences despite a decrease in CETP level of 8%. Patients receiving atorvastatin showed a relationship between changes in CETP level with total cholesterol and LDL level.

Conclusion: Atorvastatin can reduce total cholesterol and LDL significantly. It also can reduce CETP level in children refractory nephrotic syndrome with hyperlipidemia.

Keywords: *atorvastatin, CETP, children, hyperlipidemia, lipid profiles, refractory nephrotic syndrome.*

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CP-54

Impact of adherence to key performance indicators on functional outcome in acute ischemic stroke care

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Abstract

Background: There is a paucity of data on adherence to guidelines of ischemic stroke care and its impact on functional outcomes. This study aimed to evaluate the impact of adherence to key performance indicators (KPIs) on functional outcomes in acute ischemic stroke care.

Methods: This study includes a total of 738 first-ever ischemic stroke patients enrolled in the multi-centric prospective cohort study of the Malaysian National Neurology Registry (NNeuR). Patients' baseline clinical characteristics, nine KPIs, functional outcomes measured by the modified Rankin Scale (mRS), adherence to the KPIs and their relationship with the functional outcome were evaluated. A favourable functional outcome was defined as an mRS score of ≤ 2 . Kaplan-Meier survival analysis was conducted.

Results: The median (inter-quartile range) age, National Institutes of Health Stroke Scale (NIHSS), and Glasgow Coma Scale (GCS) was 59.0 (17), 6.3 (5) and 15.0 (0), respectively. Most of the patients have diabetes (69.5%) and hypertension (43.4%). The Oxfordshire Community Stroke Project (OCSP) classification, lacunar infarct (LACI) (43.1%) and partial anterior circulation infarct (PACI) (33.9) were most common. Adherence to the KPIs ranged from 3.1% for thrombolysis to 95.9% for dysphagia screening. The adherence to the discharge indicators (antiplatelet upon discharge and antilipidemic upon discharge) were associated with favourable functional outcomes. There was a significant trend (log-rank test $p < 0.001$) of decreasing survival with increasing mRS scores.

Conclusion: Our study identified varying levels of adherence to ischemic stroke guidelines in Malaysia. Discharge indicators were associated with improved functional outcomes. Increasing mRS scores were associated with decreasing survival.

Keywords: *Key performance indicators; Functional outcome; Guideline; Modified-Rankin scale; Ischemic stroke; Malaysia*

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CP-55

Using Ontology as a Decision Support System for Pharmaceuticals Product Sustainability

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Abstract

Background: Pharmaceuticals protect lives, improve health, and play an important role in many aspects of health care. The lack of using knowledge is the critical challenges in information interoperability of the pharmaceutical manufacture. This information must be gathered, stored, shared, reused, and managed in a consistent and standardized way. Ontology is widely used for health care in general and pharmaceuticals in particular. The aim of this study is to use the ontology for reducing the complexity of information and increasing its organization, facilitating sharing and reusing of information, and improving its accuracy.

Methods: What is ontology? What difficulties have been overcome until now by ontology? What is the effective role of ontology in pharmaceutical? This study seeks to address these questions.

Results: The use of ontology has shown optimistic results to support comprehensive decisions in pharmaceuticals industrial. The researchers has confirmed of the importance of using the ontology to improve interoperability over pharmaceutical product life cycle.

Conclusion: This study is expected to contribute to the development of efficient and practicable sustainability way during pharmaceuticals product design. Also, it offers a complete view to solve the lack of sharing information in the product life cycle, provide high quality and comprehensive recommendations to support the manufacture processes for product sustainability.

Keywords: *product sustainability, pharmaceuticals, ontology, health care.*

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CP-56

Current Status and Future Prospects of Complementary and Alternative Medicines in India

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Abstract

Background: Complementary and Alternative Medicines (CAMs) are widely used in India since ancient times to cure a variety of diseases including cancer, back pain, insomnia, depression, gastrointestinal illness among others. The prevalent CAMs in India among patients include Ayurveda (36%), Homeopathy (26%), Unani (18%), Yoga (9%), home remedies (9%) and others. CAMS are effective, safer, less costly and easily available compared to allopathic medicines and are prevalent since ancient times, hence widely accepted in India. Further, the Ministry of Ayurveda Yoga Naturopathy Unani Siddha and Homeopathy (AYUSH) Ministry of India is playing a major role in education, research and propagation of CAMs. Currently in the pandemic era, CAMs have been extensively used in India as prophylaxis for the COVID-19. Ayurvedic immune supplements like Chwanprash; Yoga therapy, Unani, Naturopathy have proven effective in management as well as early recovery from COVID.

Methods: A literature review was conducted on the available literature from the open source platforms.

Results: The data presented in the review suggested that the evidence-based studies, efforts are being made for the mainstreaming these Indian traditional medicines. The Indian government is also opening up hundreds of new higher educational and research institutes for CAMs which are expected to produce trained professionals in this field who will carry forward the legacy of our ancient system of medicine.

Conclusion: CAMs, besides having a popular user base in India are expected to grow in the coming years, provided the government provides support financially and with regulations wise.

Keywords: *Alternative medicines, complementary medicines, COVID-19*

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CP-57

The translation, validity test, and reliability test on CDC-HRQoL 4 for hypertension and tuberculosis patients

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Abstract

Background: Hypertension and tuberculosis are chronic diseases, one of the therapeutic focuses of which is the focus on the patient's quality of life. The evaluation of the quality of life of patients requires the concept of Health-Related Quality of Life (HRQoL), which can be measured by a quality of life questionnaire instrument, one of which is CDC-HRQoL 4. The CDC-HRQoL 4 instrument is an English-language questionnaire developed by the Behavioral Risk Factor Surveillance System (BRFSS) in the United States, and there are no similar validated questionnaires in the Indonesian language, so the process of language transfer, validity testing, and reliability testing is needed for the Indonesian CDC-HRQoL4.

Methods: External validity test was carried out by means of the correlation test of the CDC-HRQoL 4 instrument with the SF-36 instrument in groups of hypertensive patients and tuberculosis patients.

Results: It was found that the domains of the CDC-HRQoL 4 instrument significantly correlated with the SF-36 instrument domains. The reliability test in both groups of patients obtained the values of Cronbach's alpha > 0.7, which was 0.727 in the group of hypertensive patients and 0.828 in the group of tuberculosis patients.

Conclusion: The Indonesian version of the CDC-HRQoL 4 questionnaire instrument has adequate validity and reliability.

Keywords: *hypertension, tuberculosis, validity, reliability, CDC-HRQoL 4*

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CP-58

Adverse Drug Reactions and Its Management in Multidrug Resistant Tuberculosis Patients

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Abstract

Background: Treatment of multidrug resistant tuberculosis worldwide is still an important issue due to long duration of therapy and occurrence of adverse drug reactions. Understanding its management is necessary to prevent non-compliance and achieve successful therapy. This study aimed to assess adverse drug reactions and its management in multidrug-resistant tuberculosis patients.

Methods: It was a descriptive study using retrospective data of multidrug resistant tuberculosis patients completing therapy from January 1st 2015 to December 31st 2015 at tuberculosis outpatient unit in Dr. Soetomo Teaching Hospital Indonesia. All adverse drug reactions were determined by clinical criteria or laboratory data and were documented in patient's medical record.

Results: There were 40 patients included in this study. During therapy, at least 70% of patients developed 1 adverse drug reaction. The five most prevalent adverse effects found in this study were hearing disturbance (60%), hyperuricemia (52.5%), hypokalemia (27.5%), gastrointestinal disturbance (20%) and arthralgia (10%). Management of adverse drug reactions was withdrawal and switching the drug to other less toxic agent, lowering the dose of the drug that induced adverse drug reaction and adding symptomatic drugs.

Conclusion: The occurrence of adverse effects in multidrug resistant tuberculosis was prevalent and varied. Although most adverse events in this study were managed successfully, clinicians and pharmacists should be aware because some patients developed life-threatening adverse events such as hypokalemia and nephrotoxicity.

Keywords: multidrug resistant tuberculosis, adverse drug reactions, management, hearing disturbance

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CP-59

What should I do? Factors influencing the performance of community pharmacist

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Abstract

Background: The study of pharmacist work performance has been mainly focused on the quantitative aspect leading to achievement based on number rather than value. Qualitative approach is underrated despite its potential to explore pharmacist internal views. This study aims to explore pharmacist opinions regarding factors influencing pharmacist performance in community pharmacy.

Methods: This study involved 683 pharmacists in East Java in form of online survey. The study was conducted from March to June 2020 with each participant was requested to fill out a number of open questions reflecting their perceptions towards practice and factors affecting their performance. Data were thematically analyzed.

Results: The majority of respondents were female (81.7%) aged 31-40 years (42.45%). The amount of salary received ranges from 3-5 million (62.31%). There are 12 themes of factors influencing performance which were retrieved and compiled from respondents' answers with the 3 biggest factors: motivation and skills (29.39%); salary (17,25) and cooperation and communication (10,23%).

Conclusion: The factors affecting the performance of pharmacist in a community pharmacy predominantly related to pharmacist internal traits such as motivation and communication skills. This might imply for a need to mentoring and training for boosting pharmacist internal characteristics.

Keywords: pharmacist, community pharmacy, performance

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CP-60

Knowledge and Attitude of Drug Take-Back Program Among Pharmacy Visitors in Surabaya

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Abstract

Background: Drug waste is one of the hazardous wastes that can have negative impacts both on the environment and on living things such as animals, plants or humans if not handled properly. The condition can be avoided with specific regulations to process drug waste safely. In Indonesia, a drug take-back program has just been initiated called “Ayo Buang Sampah Obat” by BPOM in September 2019. This study aimed to determine the profile of knowledge and attitude related to the drug take-back program among citizens who have visited pharmacies in Surabaya, Indonesia.

Method: This research was conducted in Surabaya from February to May 2020. This study designed as a cross-sectional where data were collected using a validated questionnaire. The questionnaire was created in the Google Form platform then spread online through social media such as Instagram, Whatsapp and Line. Participants were local communities in Surabaya aged 18 years and above who were visiting pharmacies in Surabaya in the last three months. The instrument was validated in a pilot study in 50 participants.

Result: Out of 338 respondents, 93,2% (n=315) respondents have good level of knowledge and 88,5% (n=299) respondents have good attitudes. Only 10,8% (n=37) respondents were not willing to participate in the drug take-back program with “Far from home” reason chosen by 37,8% (n=14) respondents.

Conclusion: In this study, there was a high knowledge of the drug take-back program in Surabaya. Although the majority of participants had good knowledge and attitude, more research about the drug take-back program in Indonesia is still needed.

Keywords: *Attitude, Knowledge, Medication Disposal, Take Back Program*

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CP-61

Health-related quality of life and its association with sociodemographic, economic, and health status among HIV positive patients on efavirenz in northern Malaysia

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Abstract

Background: In Malaysia, 87,041 people were living with HIV (PLHIV), but only 55% of them receive antiretroviral therapy. Literature showed that health-related quality of life (HRQoL) is a predominant factor in medication adherence, and improved HRQoL is the key to secure the sustainability of HIV care. Hence, we conducted a multicentred cross-sectional study to explore the socioeconomic and health status of PLHIV, as well as the associations with different HRQoL domains.

Methods: The study was carried out among 127 PLHIV on efavirenz-based antiretroviral therapy in northern Malaysia from January to July 2020 by face-to-face interviews and World Health Organization Quality of Life (WHOQOL)-BREF questionnaire. Quota sampling method was used, which involved participant recruitment from two out of four major hospitals.

Results: Smoking was a significant risk factor of lower physical (beta coefficient (β): -6.02; 95% confidence interval (CI): -10.52, -1.52), social (β : -8.81; 95% CI: -15.63, -1.99), and environmental domain scores (β : -9.16; 95% CI: -14.29, -4.02). Poor physical health also associated with unemployment and adverse drug reaction ($p < 0.001$).

Conclusion: HRQoL of PLHIV strongly associated with their lifestyles. Pharmacists play a crucial role in initiating lifestyle modifications and resolving drug-related problems. Regular lifestyle screening of PLHIV should be made mandatory at every encounter with healthcare providers.

Keywords: *efavirenz; health-related quality of life (HRQoL); human immunodeficiency virus (HIV)*

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CP-62

Study of Chloroquine and Hydroxychloroquine for Therapy COVID-19 (Literature Review)

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Abstract

Background: Coronavirus Disease 2019 (COVID-19) is an infectious disease caused by a new coronavirus, which causes mild to severe respiratory problems. Chloroquine and hydroxychloroquine are recommended for the treatment of COVID-19. Based on invitro tests, it shows that both antimalarial are effective as a COVID- 19 therapy. Antiviral activity of chloroquine and hydroxychloroquine is due to their ability to increase organelle pH prevents the fusion and entry of virus into the cell. In addition, they can inhibit the terminal glycosylation of ACE2. This literature review is needed to determine the the effectiveness and safety of chloroquine and hydroxychloroquine in order to find a conclusion that can be used as a basis for intervening drug administration.

Methods: This study used a narrative review method which was carried out by searching on Pubmed and Science direct. After doing abstract screening and title based on the inclusion criteria, 13 articles were left to be analyzed. These articles were analyzed using effectiveness and safety parameters, namely dosage regimentation, duration of treatment, side effects, cure and mortality rate.

Results: Based on all reviewed articles, the majority of chloroquine and hydroxychloroquine could improve clinical improvement such as negative PCR results, symptom improvement, short repair time in mild/moderate COVID-19 patients. While several studies have shown worsening clinical outcomes such as the occurrence of side effects, patients are transferred to the intensive care unit, and mortality in severe COVID-19 patients.

Conclusion: From this review, the concluded that chloroquine and hydroxychloroquine was effective and safe for patients with mild/moderate COVID-19.

Keywords: *Chloroquine, Hydroxychloroquine, COVID-19, SARS-CoV-2*

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CP-63

A Case Report: Effect of Hydrocortisone on Hypocortisolism Caused by Pituitary Adenoma

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Abstract

Background: Pituitary adenoma is a tumor that causes hormone secretion disorders, one of them is hypocortisolism. Hypocortisolism causes some negative impact, there is an increase in proinflammatory cytokines and immune system activation. Therapy for hypocortisolism is high doses of hydrocortisone. In this report we present a case of hypocortisolism caused by pituitary adenoma with hydrocortisone as a therapy.

Case Presentation: A 17-year-old male presented with right eye visual loss, headache, and difficulty swallowing. He also presented mild depression during hospitalization. Magnetic Resonance Imaging (MRI) examination of the brain with contrast revealed an intracellular supratentorial axial lesion extending to the suprasellar. Based on the results of the history, physical test, and laboratory test, the patient was diagnosed with pituitary adenoma. The laboratory test showed hypocortisolism $<0.5 \mu\text{g/dL}$ (reference value 4.30-22.40 $\mu\text{g/dL}$). As treatment, he received hydrocortisone 200 mg per day, then tapering off to 100 mg per day. Tapering off to avoid side effects of high doses of hydrocortisone. In addition, the patient received operative examination for his pituitary adenoma, its endoscopic endonasal transsphenoidal hypophysectomy (EETH). There was an increase in pre-treatment cortisol $<0.5 \mu\text{g/dL}$ and 5.3 $\mu\text{g/dL}$ post-treatment and no side effect while the patient was hospitalized.

Conclusion: High doses of hydrocortisone is initial therapy for hypocortisolism in pituitary adenoma. Hydrocortisone is also safe for hypocortisolism in pituitary adenoma.

Keywords: *Hydrocortisone, hypocortisolism, pituitary adenoma*

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CP-64

**Hematological Side Effects Analysis of Linezolid In Mdr-Tb Patients With Individual Therapy
(The research was carried out at MDR TB Outpatient Clinic at Dr. Soetomo Hospital Surabaya)**

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Abstract

Background: Linezolid is an effective drug for MDR TB therapy, but it is also a drug that has a high frequency of side effects in the form of anemia, thrombocytopenia and leukopenia. Decreased kidney function and low body weight are presumed to be the risk factors of the side effects. The objective of this study was to see the prevalence of hematological side effects and to analyze the risk factors for side effects induced by linezolid. **Methods:** Data were collected retrospectively on the medical records of MDR TB patients who received linezolid between January 2018 and May 2020. Hematological effects defined as anemia, thrombocytopenia, and leucopenia. Statistical significance analysis and multivariate analysis was performed with SPSS version 24 software.

Results: 104 medical records that met the inclusion criteria were obtained, however, there were 11 patients who entered the exclusion criteria because of HIV with zidovudine as treatment, had acute renal failure, and patients had melena while undergoing linezolid therapy. So that the total sample was 93 patients. There were 32 cases of side effects in 27 patients (29.03%). The highest was anemia in 27 cases (3 with life-threatening degree), thrombocytopenia in 3 cases, and leukopenia in 2 cases. Side effects began to appear when treatment was more than 2 weeks. The results of the statistical significance analysis showed that 4 variables were significantly different in the group affected by side effects including body weight, dose per kilogram of body weight per day (DPKD), creatinine clearance, and initial hemoglobin levels.

Conclusion: DPKD > 11 mg / kg / day was the only risk factor in the multivariate analysis, with an adjusted odd ratio of 5.509 (95% CI 1.51-20.2). we recommend a tighter hemoglobin monitoring in patients weighing

<54.5 kg to prevent anemia from occurring and to increase awareness of anemia after 2 weeks of treatment.

Keywords: *Adverse Effect, Hematologic, Linezolid, Risk Factor, TB MDR*

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CP-65

The Impact of Combination Therapy Utilizing *Citrus limon* Aromatherapy and Mozart Classical Music Distraction Therapy to Reduce The Pain Intensity in Post-Sectio Caesarea Mothers

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Abstract

Background: The pain intensity in sectio caesarea postpartum women remains the most difficult physical and emotional obstacle and also it has a direct impact in slower recovery rate. Different physical and non-physical therapies were implemented to reduce the pain and to speed up the recovery. The objective of this study is to assess the direct impact to the mothers after applying a combination therapy using lemon aromatherapy and Mozart classical music distraction therapy.

Method: A total of thirty women aged between 18 and 37 years were included in this study with two sets of treatments. Fifteen correspondents received the treatments of lemon aromatherapy combined with Mozart classical music and the other fifteen obtained only deep breathing relaxation therapy (as control group). All treatments were applied for 15 minutes in one day. The level of pain intensity was measured before and after treatments.

Result: After two sets of different treatments were applied to thirty of the correspondence women, the pain intensity was measured and analyzed. A Wilcoxon signed-ranked test indicated that the combination of lemon aromatherapy and Mozart classical music was efficient to reduce the pain in the subjects of this study ($p < 0.05$). Additionally, based on the final scoring, the deep breathing exercise was less effective in lowering the pain compared to the combination of lemon aromatherapy and Mozart classical music albeit it differed significantly based on Mann-Whitney U non-parametric analysis ($p < 0.05$).

Conclusion: A significant positive deviations in pain intensity was observed in sectio caesarea postpartum women after receiving the combination treatments of lemon aromatherapy and Mozart classical music. Further studies that include prolonged follow-ups observation should be conducted to achieve an improved result.

Keywords: *sectio caesarea, classical music therapy, aromatherapy, pain intensity*

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CP-66

Effect of mixed amphetamine type stimulant and opioid dependent towards dopamine receptor in peripheral blood lymphocytes expression

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Abstract

Background: Consistent evident showed that peripheral dopamine systems reflect central dopamine systems activity and pathology especially in neuropsychiatric diseases including addiction. It has been showed that peripheral blood lymphocytes express dopamine systems.

Objective: In this study we investigated the difference in dopamine receptors DRD4 and DRD5 mRNA expression in peripheral blood lymphocytes of ATS and opioid dependence undergoing methadone maintenance treatment and healthy Malay men subjects.

Methodology: Real-time PCR method was used to assess the dopamine receptors, DRD4 and DRD5 mRNA expression in peripheral blood lymphocytes.

Results: The DRD4 mRNA expression level is significantly reduced in lymphocytes population among ATS and opioid use disorder than in healthy control. However, the change of mRNA expression level of DRD5 was statistically insignificant.

Conclusion: In conclusion, co-occurring opioid and ATS addiction was associated with persistent deficiency of DRD4 but not DRD5 in PBLs.

Keywords: *Opioid, ATS, Dopamine receptor*

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CP-67

Effect of mixed amphetamine type stimulant and opioid dependent towards dopamine receptor in peripheral blood lymphocytes expression

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CP-68

Effect of atorvastatin on lpl (lipoprotein lipase) and lipid profile in children nephrotic syndrome refracter with hyperlipidemia

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Abstract

Background: Hyperlipidemia occurs in SN caused by decrease level of lipoprotein lipase (LPL). LPL is an enzyme that is directly involved and a determinant rate in lipid metabolism through two cholesterol metabolism pathways. In previous study, lipid lowering agents haven't always given however, in the literature, statin administration remains controversial in the condition of refractory nephrotic syndrome.

Methods: The study was a RCT double blind, pre and post test control group study of 31 children nephrotic syndrome refracter with hyperlipidemia patients divided into 2 groups. The first group (n = 18 patients) treated with placebo and the other group (n = 13 patients) treated with atorvastatin.

Results: The total cholesterol and LDL from pre and post therapy of each group showed the significant differences ($p < 0,05$). However, TG and HDL did not make a significant difference. The LPL increased in the atorvastatin group but did not make a significant difference. There was no significant difference between changes in lipid profile and changes in LPL levels two group.

Conclusion: Atorvastatin therapy significantly decreased total cholesterol and LDL but not in TG. In contrast to total cholesterol, LDL and TG, administration of atorvastatin increased HDL and LPL. The relationship between LPL levels with total cholesterol, LDL, TG, and HDL levels had not been proven.

Keywords: atorvastatin, lipoprotein lipase (LPL), lipid profile (total cholesterol, LDL, TG, HDL)

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CP-69

The Role of Hyperbaric Oxygen to Platelet Aggregation in Non-Insulin-Dependent Diabetes Mellitus (NIDDM)

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Abstract

Background: Hyperglycemia in Diabetes Mellitus (DM) could cause rheological disorder, such as platelet aggregation and blood hyperviscosity. Hyperbaric Oxygen could decrease collagen as platelet aggregation agonist. This study aimed to explore the effect of HBO treatment to platelet aggregation parameters (latency time, aggregation speed, aggregation index, and aggregation percentage) with the collagen aggregator in the Non Insulin Dependent Diabetes Mellitus (NIDDM).

Methods: NIDDM patients from DM polyclinic in RSAL Dr Ramelan Surabaya which was fulfilled inclusion criteria would received HBO Therapy. Control Group/ Normoxia Normobaric (NONB) were treated with normoxia normobaric condition (20% O₂ 1 ATA) for 90 minutes and treatment group (HBO) were treated with hyperoxia hyperbaric condition (100% O₂ 2.4 ATA) for 3 x 30 minutes with interval of 2 x 5 minutes for inhaling fresh air. Subject has been blood taken for platelet aggregation test before and after HBO Therapy.

Results: Based on paired t-test, the decrease on platelet aggregation speed, aggregation index, and aggregation percentage after HBO treatment was showed significant difference on the latency time and aggregation index while in aggregation speed and aggregation percentage was not significant. NONB group after 5 days was showed a significant difference on the aggregation speed and aggregation index while in latency time and aggregation percentage was not significant.

Conclusion: The utilization of HBO 2.4 ATA 100% O₂ 3 x 30 minutes, once a day, for five days could decrease the platelet aggregation parameters (latency time, aggregation speed, aggregation index, and aggregation percentage) in patients with NIDDM.

Keywords: *Hyperoxia Hyperbaric Oxygen (HBO), Normoxia Normobaric Oxygen (NONB), platelet aggregation, Non Insulin Dependent Diabetes Mellitus (NIDDM)*

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CP-70

Effectiveness of phenytoin as monotherapy treatment in high care unit

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Abstract

Background: Altered mental status is one of the seizure manifestations. The use of antiepileptic drugs in seizures with altered mental status is routinely used for patients with suspicious of non convulsive status epilepticus in high care unit. In these conditions, the clinician may choose to give antiepileptic drugs. We will describe the use of phenytoin as monotherapy treatment in patients with altered mental status related to clinical outcomes.

Methods: This study was conducted retrospectively, through medical records of patients treated in high care unit DR. Soetomo Hospital Surabaya in January-December 2019. This study included data on all patients with seizure manifestations and altered mental status who got antiepileptic drugs.

Results: We included 45 patients. Patient with a diagnosis of stroke was 26.7%, encephalitis 24.4%, encephalopathy 22.2%, brain tumor 15.5%, epilepsy 8.8% and traumatic brain injury 2.2%. Phenytoin as monotherapy was administered in 82.2% patients (n = 37), whereas phenytoin in combination with other antiepileptic drug were administered in 17.7% patients (n = 8). The mortality rate was 26.7%, with the rates for phenytoin and phenytoin in combination with other antiepileptic drug were 27% and 25%, respectively.

Conclusion: Phenytoin as monotherapy remains the preferred treatment for seizure in high care unit setting in our study. Different strategies are required for different scenarios in different patients.

Keywords: *Antiepileptic drug, High care unit, Phenytoin, Seizure*

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CP-71

Providing Counseling Through Home Pharmacy Care (HPC) for Hemodialysis Patients with Hypertension in Lowering Blood Pressure

(The study was carried out in Outpatients Hemodialysis Unit at Aloei Saboe Hospital and Toto Kabila Hospital)

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Abstract

Background: Hypertension is one of the main factors in increasing the risk of cardiovascular disease with 51% reported cause of death in CKD patients with ESRD. It's a comorbid that needs to be managed properly and gets special attention from various health disciplines including a pharmacist.

Methods: This study is a quasi-experimental study with pretest-posttest treatment. This research was conducted through providing counseling through HPC with initial data collection and giving informed consent at the hemodialysis unit at Aloei Saboe Hospital and Toto Kabila Hospital, Gorontalo Province. The parameters in the study were patients' compliance with taking medication through the MAQ and PCA questionnaires and the patient's blood pressure.

Results: 58 patients met the inclusion criteria and were divided into 2 groups (the counseling group and the non-counseling group). Based on MAQ and PCA, the level of patient medication adherence increased significantly in the counseling group compared to the non-counseling group with a significance value of $p < 0.05$. Increasing adherence was correlated with patients' outcome of lowering blood pressure. More patients in the counseling group showed decrease in systolic and diastolic blood pressure compared to the non-counseling group (86.2% vs 17.2% for systolic BP and 69% vs 10.3% for diastolic BP). Following adjusted confounding variables, counseling through HPC provided a chance of decreasing systolic blood pressure 32 times (95% CI: 7.198-144.550) and diastolic blood pressure 42 times (95% CI: 6.204-286,677).

Conclusion: HPC affects the improvement of patient medication adherence and reduction of blood pressure in hemodialysis patients with hypertension.

Keywords: Home Pharmacy Care, Hemodialysis Patients, Hypertension, Gorontalo

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CP-72

Analysis of Prophylactic Antibiotic Use and Risk Factor of Postoperative Nosocomial Infection in Urological Surgery Patients

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Abstract

Background: The widespread use of inappropriate prophylactic antibiotics in urological surgery patients can increase the risk of resistance and development of postoperative nosocomial infection.

Objective: This study was aimed to analyze the quality of prophylactic antibiotic use and identify the risk factor of postoperative nosocomial infection in urological surgery patients.

Method: To analyze the quality of prophylactic antibiotics was using Gyssens method. To determine the risk factors of postoperative nosocomial infection in urological surgery patient was using chi square method.

Results: There were 64 patients consisted of 9 (14%) patients with skin incision and 55 (86%) patients with urethral incision. 9 patients with skin incision was observed to determine the incidence of surgical site infection and 55 patient with urethral incision was observed to determine the incidence of urinary tract infection postoperative. Observation was conducted until 30 days after incision. There is no incidence of surgical site infection and 3 incidence of urinary tract infection. Gender and catheter use were the risk factor that increasing the risk of urinary tract infection postoperative in urological surgery patients (p value <0.05). The qualitative analysis of prophylactic antibiotics using the Gyssen method showed that 13 (20.31%) was inappropriate in administration timing. It need the improvement of administration timing to increase the rationality of prophylactic antibiotics use in urological surgery patient.

Conclusion: Improvement of administration timing of prophylactic antibiotics use in urological surgery patients was needed to increase the rationality.

Keywords: *prophylactic antibiotics, postoperative nosocomial infection, Gyssens*

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CP-73

Health Related Quality of Life among Postmenopausal Woman with Hormone Responsive HER2- Breast Cancer in Indonesia

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Abstract

Background: Breast cancer (BC) in women could decrease health-related quality of life (HRQoL). HRQoL becomes important to be assessed to design the relevant treatment that could improve the patient outcomes. Furthermore, assessing HRQoL by measuring health state utilities was pivotal for health economic evaluation. This study aimed to describe the HRQoL of postmenopausal woman with Hormone Responsive (HR+) HER2- BC using the EQ5D5L instrument in Indonesia.

Methods: A cross-sectional study was conducted among 126 patients in Dr. Sardjito Hospital in Indonesia. The HRQoL was assessed by interviewing BC patients using the EQ5D5L questionnaire and the utility index was calculated using the Indonesian value set. Information regarding clinical characteristic and socio- demographic gained from patient medical records. Oneway Anova analysis were performed to compare the utility score within health state.

Result: Of the 126 patients, a mean \pm SD for age of 59.2 ± 6.1 years. Major problems of patients were pain/discomfort (75.4%) followed by anxiety/depression (54.8%). The mean (SD) of EQ5D VAS was 76.64 (14.91). Mean (SD) of utility score was 0.87 (0.10), 0.77 (0.19), and 0.58 (0.44) for free metastasis (FM), locoregional metastasis (LM) and distant metastasis (DM), respectively. Poor QoL were observed at DM health state ($p < 0.05$).

Conclusion: HRQoL of postmenopausal woman with HR+ HER2- BC was low. The major reported problems were pain/discomfort and anxiety/depression.

Keywords: *breast cancer, postmenopausal woman, quality of life, EQ5D5L, Indonesia*

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CP-74

Social media health interventions to improve diabetes mellitus patient outcome: a systematic review

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Abstract

Background: The use of modern technology and social media has revolutionized the way health information is distributed to diabetes mellitus patients. Social media can be used as a means of providing health interventions to improve patient health outcomes. Social media is able to provide a more intensive communication facility between healthcare professionals and patients.

Objective: To review and describe interventions using social media to improve health outcomes of diabetes mellitus patients.

Methods: A systematic review was carried out from three electronic databases (Pubmed, Scopus, and Medline). Eligible publications are studies that describe the use of social media interventions and health outcomes in diabetes mellitus patients.

Results: Fifteen studies were selected for this systematic review, 10 studies with a randomized controlled trial design and 5 studies with a non-randomized controlled trial design. Six studies only used interventions using social media, 7 studies used a combination of face-to-face social media intervention, 2 studies used a combination of telephone and social media intervention. One study had treatment behavior outcomes with improvement in treatment behavior, 6 studies had clinical outcomes (an improvement in HbA1C values in the six studies), 7 studies had treatment behavior outcomes and clinical outcomes (5 studies had improved treatment behavior and clinical outcomes), and 1 study had medication adherence outcome (no improvement in medication adherence).

Conclusion: These findings indicated that the use of social media as a medium of intervention can improve the health outcomes of diabetes mellitus patients.

Key words: *social media, health intervention, diabetes mellitus, patient outcome*

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CP-75

Antibiotic use on acute respiratory tract infection non pneumonia and non specific diarrhea in Primary Health Centre in Banjarbaru City, South Kalimantan, Indonesia

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Abstract

Background: Acute respiratory tract infection (ARTI) non pneumonia and non specific diarrhea are the most common cases in primary health centre (PHC) in Indonesia with the enormous use of antibiotics. The aims of this study were to analyze the antibiotic use and factors affected to the quality of antibiotic use in PHC in Banjarbaru City, South Kalimantan, Indonesia.

Methods: The study were conducted in 4 PHCs, 2 in urban and 2 in rural area. All of the patients visited these PHCs since March to April 2018 were recruited as samples after signing informed consent. Data were analyzed using SPSS version 18.

Results: There were no significant difference in antibiotic use between urban and rural PHC, both on ARTI non pneumonia and non specific diarrhea. The most prescribed antibiotics were amoxicillin and cephadroxil. Based on DDD/1000 patients-day calculation, the quantity of antibiotics in urban PHC was 3544.4 and in rural PHC was 3478.6. Physicians with a long years of service (i.e > 7 years), both in rural and urban PHC, were prescribe the antibiotics higher than who had been working for shorter period. There were no significant difference between physicians who had trained on rational drug use and had not trained yet in urban PHC ($p=0.874$), while in rural PHC there were a significant difference among them.

Conclusion: Factors affected to the quality of antibiotic use were physician's years of service and rational drug use training's attending.

Keywords: *Antibiotic, primary health centre, acute respiratory tract infection, diarrhea*

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The Impact of Suitability of Empirical Antibiotics Use on Therapeutic Outcome for Respiratory Tract Infection Patients at Inpatient Ward UGM Academic Hospital

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Abstract

Background: One type common infectious diseases nowadays is respiratory infections. This study aims to find out the impact of appropriate use of empirical antibiotic on therapeutic outcomes of patients with respiratory infections at inpatient ward UGM Academic Hospital. This study was a cross sectional that uses retrospective data through patient medical records. Population were all patients who got empirical antibiotic therapy for respiratory infections at inpatient ward on July 2018-July 2019.

Methods: Sample was collected by purposive sampling method. The appropriate use of empirical antibiotic including the right type, dosage, route, duration, and frequency was evaluated according to Antibiotic Guidelines of UGM Academic Hospital 2018, Drug Information Handbook, Frank Shann Drug Doses, Infectious Disease Society of America (IDSA)/American Thoracic Society (ATS) 2016 & 2019, Pharmacotherapy Handbook 2015, and Pharmaceutical Care for Respiratory Tract Infections 2005. Data collected was analyzed descriptively and used Chi-square bivariate analysis.

Results: The result showed that 47,9% of patients have received antibiotics properly according to the type, route, dose, frequency and duration. The results of empirical antibiotic therapy have improved the repair of vital signs in 37,5% of patients. Chi-square bivariate analysis showed result of $p = 0.478$ ($p > 0.05$).

Conclusion: It was concluded that there was no correlation between the suitability of empirical antibiotics use with the improvement on patient therapy outcomes. Thus, the use of empirical antibiotics in accordance with the guidelines did not always have an impact on improving treatment outcomes for respiratory infection patients at inpatient ward UGM Academic Hospital

Keywords: *infection, respiratory, empirical antibiotic, suitability, outcome therapy.*

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CP-77

Signal Detection of Adverse Drug Reaction to First Line Anti Tuberculosis Drugs Using the Indonesia Pharmacovigilance Database

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Abstract

Background: The study aimed to detect the first line anti tuberculosis drugs (ATD) signals in the Indonesia pharmacovigilance database.

Methods: The research method used was a retrospective cohort with a sample report of adverse drug reactions (ADRs) on the Indonesia pharmacovigilance database in National Drug and Food Control (NADFC) form 2012 to May 2018. The validity of the data was seen from the completeness of the data components. The calculation of PRR, ROR and IC were done. The signals found were verified against registered product labels, standard books and report from other countries' databases.

Results: The number of ATD ADRs reported was 5.3%. There was 2 ADRs from 2 first-line ATD combinations that meet the requirements as a signal. Those were, RHZE combinations that was rash maculo-papular (PRR 4.53; ROR 6.19; IC 0.74 and $p = 0.035$) and RH combinations that was rash (PRR 2, 94; ROR 4.23; IC 1.41 and $p = 0.046$). The confirmed signal was rash maculo-papular with RHZE.

Conclusion: To conclude, safety signals detected in the Indonesian pharmacovigilance database between 2012 and May 2018 were rash maculo-papular.

Keywords: *Pharmacovigilance, Signal Detection, Anti Tuberculosis Drug, Adverse Drug Reaction*

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CP-78

Knowledge, attitudes, and practices towards covid-19 among university students in Pakistan. An online cross-sectional study

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Abstract

Background: The study was conducted to assess the knowledge, attitude, and practices towards COVID-19 among university students in Pakistan, just before the announcement of the government to open the institutions. **Methods:** An online cross-sectional study was conducted among university students in Pakistan. A questionnaire was developed that contains demographic and KAP related information towards COVID-19.

Results: A total of 353 students completed the survey. Among the respondents, 61.5% were male, 76.8% were single, and 58.4% were enrolled in a bachelor's degree. The study showed that the majority of the respondents (68%) have good knowledge of COVID-19, while the overall knowledge score was (Mean: 8.78 ± 1.63). The highest knowledge was among the age group 28-38, (Mean: 8.94 ± 1.81). Most of the respondents (90.9%) knew COVID-19, 95.8% knew the sign and symptoms, and 83% of them knew about its transmission. There was a significant difference in knowledge scores across education and area of study $P < 0.05$. More than half (53.5%) of the respondents were satisfied with the facilities provided by the government of Pakistan. The mean practices score among the university students was 5.08 ± 1.312 . The majority (90.9%) of the students washes their hands, 91.5% cover mouth and nose while coughing or sneezing.

Conclusion: Most of the students have a good level of knowledge and do better preventive practices towards COVID-19. Respondents showed optimistic as well as cynical attitudes towards the government approach against COVID-19. Further interventions are needed to ensure better practices for the high-risk group.

Keywords: COVID-19, knowledge, attitudes, practices, university Students, Pakistan

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CP-79

Analysis of the use a combination of metformin and glibenclamide drugs with blood glucose levels at diabetes mellitus patients

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Abstract

Background: Diabetes mellitus is a non-communicable disease which is a concern a national and global public health problem. Indonesia was ranks sixth in the world with a prevalence of 8,6% of the total population and it is estimated that in 2025 it will increase to 12,4 million sufferers. This research was conducted at the Kebondalem Bangorejo of public health center. The purpose of this study was to determine changes at blood glucose levels of diabetes mellitus patients on administration of a combination of metformin and glibenclamide drugs.

Methods: This research used a type of comparative, comparatively paired sample analytical research, with the design cohort retrospective. The instrument used in this research was a patient's medical record. The population in this study were all adults diabetes mellitus patients that over 18 years old at the period of March-Mei 2020. Samples were calculated using the total sampling technique during the research period. The Data was processed using SPSS version 18 and analyzed use Wilcoxon test. **Results:** The results showed that random blood glucose levels before the use of a combination metformin and glibenclamide with an average of 292,80 mg/dl and after using combination metformin and glibenclamide drugs was had decrease of -76.1mg/dl.

Conclusion: A combination of metformin and glibenclamide drugs provided changes in blood glucose levels decrease in diabetes mellitus patients, so it can be used as an antihyperglycemic recommendation according to the classification of patients in research.

Keywords: *diabetes, metformin and glibenclamide, blood glucose*

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CP-80

The effect of medication reconciliation of antihypertension drugs on admission to medication errors in hypertension patients

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Abstract

Background: Medication Error (ME) was any avoidable event that caused or results in improper drug services or endangers the patient while the drug was in the supervision of health personnel or patients. ME is estimated to result in 7000 patients dyed per year in the USA. At the hospital the ME figure is reported to be about 3- 6.9% in patients undergoing hospitalization. This study aims to determine the effect of medication reconciliation antihypertension drugs on medication errors in patients with hypertension cardiovascular complications, at dr Soebandi regional hospital.

Methods: The type of this research was analytic observational research with prospective cohort type. The research was conducted by interview using check-list and questionnaire, while secondary data was taken from the patient record. The inclusion criteria in the study were patients older than 18 years old with a diagnosis of hypertension of cardiovascular complications who underwent minimal hospitalization for the first three days (72 hours) from hospital admission, hypertension medication and willing to follow the study by completing informed consent. Samples were calculated using the total sampling technique during the research period. The data was processed using SPSS version 18 and analyzed use multivariate analysis.

Results: The results of 142 patients who met the inclusion criteria stated that reconciliation variable had Odds Ratio (OR) value was more than one that showed a strong relationship with medication error.

Conclusion: Medication reconciliation can be used as a tool to prevent medication errors at health service facilities.

Keywords: *medication errors, medication reconciliation, antihypertension drug*

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CP-81

Attitude, practice, knowledge and reasons of use among traditional and complementary medicine users in Malaysia

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Abstract

Background: Safe use of traditional and complementary medicine (T&CM) is one of the highlighted interests to be explored in the quality use of medicine exercise. Therefore, the aim of this study is to understand the attitude, practice, knowledge and reasons of use among T&CM users in Malaysia.

Methods: A questionnaire-based cross-sectional study was conducted through convenience sampling method across Malaysia. Study approval was obtained from the institutional ethical committee and written consent was taken from the participants prior to data collection.

Results: A total of 562 participants had responded to this survey as T&CM users. 74% of the participants considered using T&CM to improve some of the symptoms and were interested in any kinds of T&CM which promote body self-healing (71.5%). However, 56.5% of the participants agreed that they do not have enough knowledge to select the right T&CM. 49.5% of the participants did not inform their medical doctors on their T&CM usage. About half of the participants had taken modern medicine and T&CM concurrently before. The main reason for taking T&CM is due to their understanding that T&CM is more natural (73.3%) and have less side effects (40.2%). 60.5% of the participants did not know or were unsure that T&CM products must be registered with the health authority.

Conclusion: The findings of the study may help healthcare professionals to provide appropriate guidance regarding the rational use of T&CM by understanding more about T&CM users' attitude, practice, knowledge and reasons of using T&CM.

Keywords: *Traditional and complementary medicine, attitude, practice, knowledge*

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CP-82

FKBP5 polymorphism association with asthma susceptibility in asthmatic patients

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Abstract

Background: Inhaled corticosteroids are the most effective controllers of asthma. Asthmatic, however, vary in their response to inhaled corticosteroid. No previous study assesses the relationship of FKBP5 polymorphism with corticosteroid resistance in asthmatic patients whereas the FKBP51 is major components of Glucocorticoid receptor which regulates its sensitivity to corticosteroid. Besides, FKBP5 gene polymorphism was associated with anxiety, mood and psychiatric disorder.

Methods: Sixty-eight asthmatic patients and 40 control were studied, DNA was extracted from whole blood of asthmatics and control, FKBP5 gene fragment was amplified by PCR and then sequenced by Sanger method. The sequencing results were aligned by mapping on reference sequence from NCBI and SNPs were checked, genotype, allele frequency and odds ratio (OR) were calculated.

Results: The FKBP5 fragment sequencing revealed the presence of (rs1360780) and one novel SNP found just in 17 sample of asthmatic patients as compared db SNP data NCBI.

The FKBP5 variant (rs1360780) revealed allele frequency of risk allele T was higher in patients than in control $P < 0.001$ and $O.R = 2.8$ when compared to wild C allele frequency in patients was less than control. The novel SNP FKBP5 as compared to SNP database at NCBI in which wild T allele was substituted with G, the novel SNP was submitted to clinvar submission portal of NCBI with accession number: rs15818422283. It showed asthma susceptibility risk factor with allele G frequency in asthmatics five times more than control $OR = 5.2$, $P < 0.05$ when compared to wild T allele frequency.

Conclusions: the risk allele T of rs1360780 and the novel SNP rs1581842283 risk allele G Predict asthma susceptibility and showed no association with corticosteroid resistant in asthmatics.

Keywords: *Asthma, FKBP5 polymorphism, corticosteroid resistance*

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CP-83

Comparison of Kanamycin and Capreomycin-Induced Hypokalemia in Multidrug-Resistant Tuberculosis Treatment at Dr. Soetomo General Hospital

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Abstract

Background: Hypokalemia is one of the most prevalent adverse effects found in Multidrug-Resistant Tuberculosis (MDR-TB) patients and it is a serious condition requiring routine monitoring. This study was performed to identify and compare the hypokalemia adverse event during treatment with kanamycin and capreomycin among MDR TB patients as well as to analyze factors contributed to hypokalemia.

Methods: A retrospective cross-sectional study using MDR-TB patient's medical records from January 2018 to June 2020 at MDR-TB Unit Dr. Soetomo Hospital Surabaya in Indonesia.

Results: 112 MDR TB patients met the inclusion criteria where 68 patients used kanamycin and 44 patients used capreomycin. Hypokalemia was found in 26 patients (38.24%) in the kanamycin group and 31 patients (70.45%) in the capreomycin group. The mean onset of adverse drug reaction in the kanamycin group was 64.58 days and 60.01 days in the capreomycin group. Serum potassium levels were significantly lower in the capreomycin group than in the kanamycin group (2.6 mEq/L vs 3.1 mEq/L, $p < 0.05$). The grade of hypokalemia and the need for hospitalization were higher in the capreomycin group. Analysis of the risk factors such as gender, age, body weight, presence of comorbid, dose per kg received by the patient, and the patient's initial potassium level showed that none of them had a significant effect on the emergence of hypokalemia.

Conclusion: Our study emphasizes the importance of routine monitoring of serum potassium during MDR- TB treatment, and need more caution when treatment used the capreomycin-based regimen.

Keywords: *hypokalemia, MDR TB, kanamycin, capreomycin, Dr. Soetomo Hospital*

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CP-84

Role of *Centella asiatica* and ceramide in skin barrier improvement: a double blind clinical trial of Indonesian batik workers

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Abstract

Background: Batik dyes contains irritant chemicals that increase the risk of skin barrier disruption. This study aims to determine the effect of *Centella asiatica* and ceramide in trans epidermal water loss (TEWL), skin hydration and acidity (pH). **Methods:** This was double blind clinical trial of 30 Indonesian batik workers who suffered from skin dryness, but has no clinical manifestation of contact dermatitis. Subjects were given cream contained *Centella asiatica* or ceramide that formulated and randomly labeled by manufacturer (PT Paragon Technology and Innovation). Both subjects and researchers were blinded to the type of cream. Cream was applied to the hands and arms twice a day. Biological function of the skin (TEWL, skin hydration and acidity) was examined by Cutometer dual MP-580. Baseline was recorded in the first examination, followed by second and third examinations at two and four weeks after treatment.

Results: After four weeks treatment, there were significant improvement of *Centella asiatica* application in evaluation of corneometer palmar ($p=0.007$; CI 95%), corneometer dorsum ($p=0.001$; CI 95%), and skin acidity dorsum ($p=0.17$; CI 95%). Ceramide application also gave significant improvement of corneometer palmar ($p=0.038$; CI 95%), skin acidity palmar ($p=0.001$; CI 95%), TEWL dorsum ($p=0.023$; CI 95%), corneometer dorsum ($p=0.002$; CI 95%) and skin acidity dorsum ($p=0.11$; CI 95%). There were no significant differences of *Centella asiatica* effectiveness compared to ceramide in skin barrier improvement.

Conclusion: *Centella asiatica* and ceramide can improve skin barrier hydration in order to prevent the risk of contact dermatitis in batik workers.

Keywords: *Centella asiatica*, ceramide, Indonesian batik workers, skin barrier.

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CP-85

Comparison and validation of EuroQol-5 Dimension-5 Level and Short Form-6 dimension in cataract patients

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Abstract

Background: EQ-5D and SF-6D are instruments that have been widely used to assess utility index as an outcome parameter in pharmacoeconomic studies. The choice of an instrument will have an important effect and can influence the decision making of an economic health evaluation. The aim of this study was to compare the SF-6D and EQ-5D instruments to assess utility index in cataract patients.

Methods: The study was conducted with a cross sectional design on 448 cataract patients in a hospital in Yogyakarta. The subjects of the study were outpatient cataract patients over 45 years of age. The patient's HRQoL was assessed using the SF-6D, EQ-5D, and visual function questionnaire instruments. The construct validity was tested including known group validity using the independent sample t test and ANOVA, convergent validity with the Spearman correlation, ceiling effect, and bland and altman plots.

Results: A total of 448 cataract patients, mean age 64.7 (10.1) years, showed utility index assessed using the EQ-5D-5L and SF-6D instruments, which were 0.708 (0.220) and 0.759 (0.147), respectively. Convergent validity shows that the EQ-5D-5L dimensions have a moderate to very strong correlation (0.384-0.889) with the dimensions on VFQ-25, as well as the SF-6D (0.434-0.824). There is no ceiling effect on the SF-6D. Known group validity shows that both EQ-5D-5L and SF-6D can differentiate the patient's health status based on cataract surgery, visual acuity, and comorbidity. The Bland Altman plot shows the level of agreement between EQ-5D-5L and SF-6D of 91.7%. In better health status, the utility index of EQ-5D-5L is higher and vice versa, in the worse health status the utility index of SF-6D is higher.

Conclusion: both the EQ-5D-5L and SF-6D instruments are valid for assessing the utility index in cataract patients. By using different instruments, there are differences in the utility value of cataract patients based on their health status. Therefore it is necessary to consider in choosing the instrument in assessing utility as an outcome parameter in pharmacoeconomic study.

Keywords: *utility index, cataract, EQ-5D-5L, SF-6D*

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CP-86

Correlation of Dietary Iron Intake and Serum Iron with Thyroid Stimulating Hormone (TSH) and Free Thyroxine (FT4) Levels in Adult Hyperthyroid Patients

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Abstract

Background: National Baseline Health Research in 2013 showed that there were 706,757 (0.4%) hyperthyroid patients in Indonesia. Hyperthyroidism is characterized by abnormal *thyroid stimulating immunoglobulin* (TSI) which causes low TSH and high FT4 levels. Hyperthyroid patients have a decrease of serum iron levels due to acute phase reactions of hyperthyroidism. This study aimed to analyze the correlation between dietary iron intake and serum iron with TSH and FT4 levels in adult hyperthyroid patients.

Methods: This study was conducted in February-July 2020 at the Clinic of Magelang Health Research and Development Center. A cross sectional study sampling based on inclusion criteria which obtained 50 adult hyperthyroid patients. Dietary iron intake collected by 2x24 hour dietary recall, serum iron measured with colorimetric analysis, TSH and FT4 levels measured by ELISA. The collected data were analyzed using Spearman correlation and multivariate linear regression with 95% confidence level.

Results: Insufficient dietary iron intake was found in 32 hyperthyroid patients (64%). Low serum iron levels were found in 10 hyperthyroid patients (20%). Spearman correlation analysis showed that iron intake had a negative correlation with TSH ($r = -0.294; p < 0.05$) but did not correlate with FT4 ($r = -0.142; p > 0.05$), while serum iron did not correlate with both TSH ($r = 0.101; p > 0.05$) and FT4 ($r = 0.142; p > 0.05$). Furthermore, regression analysis showed that dietary iron intake did not correlate with TSH levels ($b = -0.008; p > 0.05$).

Conclusion: Dietary iron intake and serum iron did not correlate with TSH and FT4 levels in adult hyperthyroid patients.

Keywords: *dietary iron intake, serum iron, TSH, FT4, hyperthyroid*

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CP-87

Drug Utilization Study of Lopinavir and Ritonavir in COVID-19 Patients
(Literature Review)

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Abstract

Background: Corona Virus Disease-2019 (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Based on guidelines from China's National Health Commission, a combination of lopinavir and ritonavir is recommended as antiviral therapy for COVID-19. Lopinavir and ritonavir can inhibit the action of the 3CLpro enzyme, thus interfering with the replication and release of viruses from host cells. However, coronavirus proteases (including 3CLpro) do not contain a symmetrical bag of C2, which is the target of HIV protease inhibitors. This literature review is needed to determine the clinical outcome of using lopinavir and ritonavir in COVID-19 patients in order to find a conclusion that can be used as a basis for intervening drug administration.

Methods: This study used a narrative review method which was carried out by searching on Pubmed and Science Direct. After doing abstract screening and title based on the inclusion criteria, 13 articles were left to be analyzed. These articles were analyzed using predetermined clinical outcome parameters, namely duration of hospital stay, composite event, clinical symptom score, time to achieve negative RT-PCR, duration of mechanical ventilation, and all-cause mortality.

Results: Based on all reviewed articles, the majority of clinical outcome parameters showed an outcome that was no better than standard care or other drugs.

Conclusion: From this review, it can be concluded that the combination of lopinavir and ritonavir did not produce better clinical outcomes than standard care or other drugs in COVID-19 patients.

Keywords: COVID-19, Lopinavir, Ritonavir

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CP-88

Analysis of HMGB-1 level before and after providing atorvastatin standard therapy in coronary artery disease patients with diabetes mellitus type-2 compared to without diabetes mellitus type-2

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Abstract

Background: Coronary artery disease (CAD) is one of the main causes of mortality in cardiovascular diseases. Atherosclerosis is the reason. Over time, plaque narrows and hardens your arteries. This restricts the stream of oxygen-rich blood to the heart. Atherosclerosis can lead to heart attack. The narrowing of the arteries then makes blood flow more difficult for the heart. When the plaque was ruptured, the heart attack occurred. The vascular smooth muscle cells release danger-associated molecular patterns (DAMPs) that escalate or induce inflammation. These DAMPs include High-Mobility Group Box-1 (HMGB1). Pleiotropic effect of atorvastatin as an anti-inflammatory is one of the target drugs for HMGB-1. Several studies have shown the clinical relationship between HMGB-1 and atorvastatin as an anti-inflammatory agent in CAD. Several clinical studies have shown serum HMGB-1 level significantly higher in CAD patients with diabetes mellitus than without diabetes mellitus.

Objectives: This prospective observational study was aimed to analyze the effect of atorvastatin on serum HMGB-1 levels in CAD with type-2 diabetes mellitus and without type-2 diabetes mellitus from HMGB-1 when patients entered and left the hospital.

Methods: Samples were collected from prospective observation pre-post study in May-July 2018 with consecutive sampling method. Serum HMGB-1 levels were measured in patients with CAD who were given atorvastatin for CAD with type-2 diabetes mellitus compared without type-2 diabetes mellitus in a patient ward. Blood was collected on admission day and before the patient left the hospital. After centrifugation, serum samples were stored at -80°C before measurement. We used an ELISA Kit (IBL International) to determine HMGB-1 concentrations. This research protocol has been approved by the Ethical Committee of Dr. Soetomo General Hospital Surabaya.

Results: We enrolled 38 patients and divided them into two groups which 19 patients on CAD with type-2 diabetes mellitus and 19 patient without type-2 diabetes mellitus. Serum HMGB-1 levels in CAD with type-2 diabetes mellitus were increased significantly ($p=0.049$) and not significantly decreased in CAD with no type-2 diabetes mellitus ($p=0.480$). The HMGB-1 level was not significantly different between the two groups ($p=0.210$).

Conclusions: HMGB-1 levels after providing atorvastatin in coronary artery disease with type-2 diabetes mellitus increased significantly, meanwhile, in CAD without type-2 diabetes mellitus did not decrease significantly. The HMGB-1 level was not significantly different between the two groups. Longer time and more point for the collected sample needed for further research.

Keywords: *Coronary artery disease, Diabetes Mellitus, Atorvastatin, HMGB1, Inflammatory marker*

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CP-89

Therapeutic Drug Monitoring in Predicting Methotrexate-Induced Adverse Reactions In Patients With Rheumatoid Arthritis – Indicated or Not?

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Abstract

Background: Weekly oral low-dose methotrexate (MTX) therapy is widely used to treat rheumatoid arthritis (RA) due to its high efficacy. However, MTX is associated with some life threatening adverse drug reactions (ADR). It is well known that the plasma MTX concentration is related to the efficacy and safety of MTX in high-dose therapy for malignancy. Therefore, we conducted a review to evaluate the relationship between MTX concentration and incidence of ADR in adult RA patients.

Methods: All available literatures between 1985 till April 2019 were identified from PubMed Central (PMC), PubMed / Medline, Science Direct and Springer Link. Of the initial 275 articles identified, 11 literatures met the inclusion criteria.

Results: Types of MTX-related concentration measured in the literatures include 6 (55%) articles with MTX concentration at ≥ 24 hours post dose, 3 (27%) with MTX concentration at 2 hours (C_{max}) and 2 (18%) using erythrocyte MTX-polyglutamate (MTX-glu) level. Higher C_{max} was significantly correlated with ADR (mean C_{max} 1.2 μ mol/L, $p < 0.001$). Maximum total MTX-glu concentration at 24 weeks of follow up was significantly higher in patients with ADR (mean MTX-glu 153nmol/L, $p < 0.05$). Out of total 430 subjects, 161 (37%) reported MTX-related ADR. 80 (50%) subjects suffered from hepatotoxicity, 59 (37%) hematological toxicity, 4 (2.5%) pneumonia and 18 (10.5%) other ADR.

Conclusion: C_{max} and MTX-glu concentration can be useful in predicting ADR in adult RA patients. MTX dose as low as 7.5mg/week may result in ADR, where pancytopenia was the most severe.

Keywords: Methotrexate, rheumatoid arthritis, concentration and adverse.

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CP-90

An evaluation on perception, knowledge and practices about the use of paracetamol among parents in treating their children: a study from Penang, Malaysia

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Abstract

Background: Paracetamol is currently widely available over the counter and comes various dosage forms for the use of children. Inappropriate dosing use of paracetamol has been reported to be a common and continuing problem, particularly in parents taking paracetamol to treat their children. However, little is known about issues around the use of paracetamol among Malaysian parents. This study therefore aims to evaluate the perception, practices and knowledge of paracetamol among Malaysian parents in treating their children.

Methods: A cross-sectional survey involved quantitative structured interview was conducted among 93 parents in Penang, Malaysia from 1st August to 31th August 2019.

Results: Majority of the parents (87.1%) had given paracetamol to treat their children and syrup was the most popular dosage formulation. Most of the parents agreed that paracetamol is very effective for fever in child (74.2%) and should be kept in every house for child (80.7%). The parents mostly (58%) agreed that paracetamol is safe for the use for child. Only 28.2% of the parents correctly indicated that paracetamol overdose will cause liver damage. When assessing the parents' knowledge of the dose and frequency of paracetamol for child, most of the parents (61.3%) demonstrated a poor knowledge with the score of 20 – 39%.

Conclusion: The knowledge of paracetamol particularly the appropriate dose and frequency is currently insufficient among the parents. Educational intervention is required to ensure safe use of self-medication practice on paracetamol among the parents.

Keywords: Paracetamol, Parents, Children, Perception, Knowledge, Practices

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CP-91

Scoping review: Hydroxychloroquine for treatment of covid-19

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Abstract

Background: COVID-19 is declared a pandemic of international concern. Until now there has been no approved specific treatment for COVID-19 or a vaccine to prevent coronavirus infection. Hydroxychloroquine has received attention as a potential therapeutic agent against COVID-19.

Methods: The research method is an electronic literature search using the PubMed database and Science Direct. The literature that was included in the search criteria was literature published from December 2019 to June 19, 2020. The literature obtained was extracted and analyzed critically.

Results: A total of 4231 articles were screened and 6 literatures that match the inclusion criteria were obtained for a total sample of 3434 patients. Several studies have shown good virological and clinical results using hydroxychloroquine therapy with or without azithromycin and a relatively small risk of side effects. Several other studies have shown unfavorable results using hydroxychloroquine therapy.

Conclusion: The use of hydroxychloroquine with azithromycin can be used as a short-term solution for alternative therapies to overcome the COVID-19 pandemic with close monitoring for side effects.

Keywords: *COVID-19, coronavirus, hydroxychloroquine, azithromycin*

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CP-92

Screening for type 2 diabetes mellitus in visitors of primary health care centers in Surabaya with BMI score above normal

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Abstract

Background: Diabetes mellitus is a chronic condition that occurs when the level of blood glucose increase because the body cannot produce enough sufficient insulin or use insulin ineffectively. This study targeted the visitors of primary health care centres in Surabaya who had Body Mass Index (BMI) above average (≥ 25 kg/m²) at the time of the study. This study aimed to identify the risk profile for developing type 2 diabetes mellitus in visitors of primary health care centres in Surabaya with a BMI score above normal.

Methods: This study was a cross-sectional study using the CANRISK (The Canadian Diabetes Risk Questionnaire). Respondents were recruited using accidental sampling method in several primary health care centres in Surabaya. About 121 respondents agreed to participate in this study.

Results: The results showed that 9,1% (11) respondents had low risk; 28,1% (34) had moderate risk and 62,8% (76) had a high risk for developing type 2 diabetes mellitus in the next ten years. This study were also showed significant difference between age ($p = 0.000$), gender ($p = 0.000$), history of hypertension ($p = 0.006$), and education ($p = 0.002$) in the risk category for developing type 2 diabetes mellitus using the CANRISK questionnaire.

Conclusion: In conclusion, respondents with moderate and high risk can improve lifestyle, increasing the frequency of exercise can reduce or normalize BMI and size of waist circumference. Choice of foods with low salt intake and access information related to type 2 DM prevention.

Keywords: *type 2 diabetes mellitus, The Canadian Diabetes Risk Questionnaire, screening, BMI score above normal*

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CP-93

Cost of illness of diabetes mellitus in Indonesia: A systematic review

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Abstract

Background: Diabetes Mellitus (DM) is a group of insulin metabolism disorder that affects the socio-economic conditions of the society. The cost of treating diabetes in 2019 was USD 760 billion and by 2045 there are predicted to be 700 million people living with diabetes. The purpose of this systematic review was to provide an overview of the economic burden caused by Diabetes Mellitus for the government, health care providers, and for the society in Indonesia.

Method: This systematic review was carried out by considering the related studies about cost of illness, evaluation of disease costs, or therapeutic costs for various types of diabetes mellitus that were published in both English and Indonesian. The search engines PUBMED, DOAJ, SCOPUS, SCIENCE DIRECT and GOOGLE SCHOLAR were used without date published restrictions.

Result: A systematic search identifies 18 eligible studies conducted in various regions in Indonesia. The study was retrospective with variation in their perspectives and methods to estimated the diabetes cost. Drugs cost was the major contributor to direct medical cost followed by laboratory cost and complications cost. While other cost was affected by transportation cost, productivity losses, and time spent by family accompanying patients.

Conclusion: Diabetes Mellitus creates a significant financial burden and affects the health care system as well as the individual and society as a whole. Research about cost of diabetes in the future should carried out on a large scale in order to get a more spesific cost estimation.

Keywords: *Diabetes mellitus; Cost of Illness; Economic Burden of Disease*

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CP-94

Factors that influence adverse drug reactions reporting practices by healthcare professionals in Surabaya

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ABSTRACT

Background: The lack of reporting of adverse drug reactions (ADRs) still becomes a major problem in spontaneous reporting by healthcare professionals. The purpose of this study was to determine the factors that influence ADRs reporting practice by doctors and nurses at hospitals in Surabaya.

Methods: This research was a cross sectional research conducted in two hospitals that contribute to reporting of ADRs to Indonesia National Agency of Food and Drug Control (NA-DFC). A total of 160 respondents consisting of doctors and nurses had filled the questionnaire out. The questionnaire had been tested for validity and reliability. The questionnaire contained statements that included demographics, knowledge, attitude, access to reporting facilities and infrastructure, environment, and practices related to ADRs monitoring and reporting. Interview was also used to obtain availability of facility / infrastructure and also policy and incentive.

Results: Results showed that there were influences of attitude and environmental variables on the practice of ADRs reporting with a significance value of 0.001 and 0.000 ($p < 0.05$) using multiple linear regression test. The results also showed differences in knowledge between doctors and nurses regarding the purpose of ADRs reporting, good reporting method, reporting policy, drug safety, and reporting program ($p < 0.05$).

Conclusion: It can be concluded that attitudes and environment become the factors that influence the practice of ADRs/ESO reporting done by doctors and nurses. Access to the means of reporting such as the reporting form still needs to be improved to encourage and increase the number of ADRs/ESO reports by healthcare professionals.

Keywords: *Adverse drug reactions (ADRs), reporting, healthcare professionals*

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CP-95

Cost of Illness Study of Type 2 Diabetes Mellitus in Indonesia

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ABSTRACT

Introduction: The economic burden of diabetes could result in public health problems. To formulate an effective response, it is important to understand the cost of illness of the disease. This study aimed to determine the cost of illness in type 2 diabetes mellitus patients in Surabaya, Indonesia.

Methods: The study was conducted in 15 Primary Healthcare Centers in Surabaya on January-March 2019. This was a cross sectional study using purposive sampling method. The study was based on a societal perspective. The cost measurement method used a list of interview questions to determine the cost of illness.

Results: Fifteen Primary Health Care Centers in Surabaya were chosen. A number of 218 patients who received either insulin (in monotherapy or combination) or oral antidiabetic drug (in monotherapy or combination) were interviewed. Results showed that the average total annual costs of type 2 diabetes mellitus patients was IDR 1,712,133.30 ± 2,498,851.17 per patient per year; direct medical costs was IDR 1,274,307.43 ± 2,395,862.84 per patient per year; direct non-medical costs was IDR 145,812.62 ± 299,984.61 per patient per year; and indirect cost was IDR 292,013.24 ± 483,597.68 per patient per year. The highest cost was direct medical cost which was drug cost accounted for IDR 969,730.10 ± 2,343,852.46 per patient per year.

Conclusion: This study provides important data regarding cost of illness in type 2 diabetes mellitus patients and can be used as a guide for further research and policy.

Keywords: *Cost of illness, type 2 diabetes mellitus, primary healthcare center*

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CP-96

RISK FACTORS AFFECTING THE INCIDENCE OF COMPUTER VISION SYNDROME (CVS) IN HIGH SCHOOL STUDENTS

(Study at SMAN 2 and SMA Muhammadiyah 3 Jember, East Java, Indonesia)

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Abstract

Background: Computer vision syndrome (CVS) is a collection of various eye and vision symptoms that results from using electronic gadgets. Common symptoms include dry eyes, blurred vision, eye strain, headache, and neck and shoulder pain. Chronic exposure to electronic gadget could induce dry eye among students who nowadays their works need electronic gadget assistance.

Objectives: This study was carried out to analyze the difference among mild, moderate and heavy exposure risk factor for using electronic gadget and the incidence of dry eye which is one of CVS symptoms.

Methods: An observational cross-sectional study was done using quota sampling method for 100 High School students in August 2020. Data collection was performed using questionnaire to identify daily use of electronic gadget (hours per day) and history of using electronic gadget (years). Dry eye was diagnosed using tear break up time test (TBUT).

Result: Samples that met the inclusion criteria were 94 students. A total of 82 students (87.2%) experienced dry eyes. There were 11 students (11.7%) had dry eyes with mild exposures, 18 students (19.1%) had dry eyes with moderate exposure, and 53 students (56.4%) had dry eyes with heavy exposure. There were no significant different among mild vs moderate vs heavy exposure for using gadget to the incidence of dry eye in High School students in Jember ($p=0.836$).

Conclusion: The risk of developing CVS in young age with normal tear production could be induced even with minimal exposure to gadget.

Keywords: CVS, TBUT, dry eyes, High School, Student, Jember

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CP-97

Role of pharmacist in providing drug information and education for patients with chronic diseases during transition of care

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Abstract

Background: The transition between inpatient and community settings often put patients at a risk for a lack of communication between healthcare providers resulting in some possible issues such as inadequate patient information, medication errors and incomplete medication management. Community pharmacist can play an active role in improving care for recently discharged patients through provision of information and education and more importantly prevent readmission to hospital. This study aims to investigate the impact of pharmacist providing drug information and education for discharged patients with chronic disease.

Methods: An observational study was conducted between July to October 2019 involving 153 patients with chronic diseases particularly targeting patients with hypertension and diabetes mellitus. Patients were purposively recruited from 11 pharmacies in East Java. A questionnaire was used to record patients' opinions regarding provision of drug information and education by pharmacist. The results were descriptively analyzed.

Results: Overall, patients mentioned that pharmacists mainly provided information about how to use the drugs (83%). The education provided by the pharmacist has improved patients' understanding about their disease state (70%) and influenced compliance when using the medicine (68%). Patients acknowledged pharmacist's effort to ensure the positive outcome of the therapy. However, no data has been recorded whether such service may prevent patients from being readmitted to hospital.

Conclusion: Pharmacist is at a unique position in the transitions of care. Pharmacist can provide information and education that may contribute to improve patients' understanding and compliance.

Keywords: *pharmacist, drug information, patient education, transition of care, chronic disease*

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CP-98

A Review On The Possible Factors Affecting Hyperglycemia Management During Acute Ischemic Stroke

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Abstract

Hyperglycaemia (HG) are frequently observed in patients admitted to hospital for acute ischemic stroke (AIS) which have been associated with poor clinical outcomes including greater infarct growth and hemorrhagic infarct conversion. HG has been reported to increase tissue plasminogen activator induced symptomatic intracranial haemorrhage. Insulin therapy to achieve normoglycemia during the acute phase is associated with better clinical outcomes in other groups of critically ill patients. In contrast, to date, there is no conclusive evidence for the optimal target of blood glucose as well as the optimal strategies to control HG during AIS. In addition to not stratifying patients according to their pre-stroke glycaemic status, differential pathophysiology of insulin regulation related to stress hyperglycaemia in this population during the acute phase are the proposed mechanisms to explain on the inability to demonstrate expected benefit from the insulin therapy. Previous studies reported a few possible factors influencing the hyperglycaemic control during the acute stage which include the variabilities in pharmacokinetic and pharmacodynamic effects of insulin on blood glucose regulation, disease severity, haemoglobin A1c level on admission and nutrition support during the acute care. This review highlights the possible factors affecting HG management during the AIS and areas of future research in this field.

Keywords: *acute ischemic stroke, hyperglycemia, insulin*

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CP-99

Exploring pharmacist experience and acceptance for debunking health misinformation in the social media: results of a small survey and focus group approach

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Abstract

Background: The increasing evidence of misinformation on health and pharmacy issues being circulated in Social Media (SM) may provide potential for pharmacist involvement. Due to societal and technological changes, SM can become a new frontier for pharmacist in describing and debunking misinformation to individual patient and general public. However, such involvement is not without a risk. This study, therefore, aims at exploring pharmacist experience and acceptance to use SM as a tool for debunking health and pharmacy misinformation.

Methods: A mixed methods study involving a small survey followed by Focus Group Discussions (FGDs) with pharmacist from a wide range of background as participant. The study was conducted in four different cities in Indonesia attended by 41 selected pharmacists. The survey asked participant's past experience with misinformation circulated via SM and action taken with the information. The results were brought into FGDs with participants discussed their acceptance for debunking misinformation. The FGDs were audio recorded, subsequently transcribed and thematically analyzed.

Results: Most misinformation mentioned by the respondents were related to the use of herbal medicines. The majority of pharmacists often clarified the misinformation, but they were unkeen to pledge a report to the authorities for preventing the misleading information recirculated. Motivation, opportunities related to time and job burden, personal relationship within pharmacist cohort and capability to devise a counter message are themes determining pharmacist acceptance for debunking misinformation in SM.

Conclusion: Pharmacist has the potentials to reduce and prevent misinformation about health and pharmacy issues in SM. However, more resources, time and efforts must be invested to play such role.

Keywords: *pharmacist, social media, misinformation, community pharmacy*

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CP-100

The nature and prevalence of prescription dispensing services in the developing world: evidence from the nationwide community pharmacy survey

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Abstract

Background: Community pharmacy is the main venue for general public to obtain medicines and pharmacy services. Dispensing prescription is the predominant activity in community pharmacy. However, in the context of developing country, there is limited evidence regarding the characteristics and prevalence of this service. Therefore, this study aims to describe and quantify the provision of dispensing service in Indonesian community pharmacy.

Methods: A nationwide community pharmacy was conducted from September 2018 to May 2019 across 34 provinces in Indonesia. The expected sample size was 7,000 pharmacies with pharmacist as the respondent was required to complete an online survey. The questionnaire asked the types and number of patients served with respect to dispensing prescription related activities and services. Descriptive statistics were used to describe the features of the findings.

Results: Only 1,952 pharmacies responded to the survey. Most of these pharmacies were independent outlet (82%) employing only one pharmacist (82%). There were only 38% of pharmacies which dispensed equal or less than 10 prescriptions per month from the General Practitioners (GPs). However, such proportion tended to increase with respect to dispensing prescriptions from specialists (64%) and dentists (77%), respectively. A significant portion of pharmacies conducted prescription analysis (77%), counselling (87%) and drug information (89%) to patients, respectively.

Conclusion: Dispensing prescriptions remains the predominant activity in Indonesian community pharmacy. This service is substantial to pharmacy practice and generally acknowledged by the public as the forte of community pharmacy.

Keywords: *community pharmacy, pharmacist, dispensing, developing country*

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CP-101

The remuneration of community pharmacist in the setting of Low- and Middle-Income Country

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Abstract

Background: Community pharmacist has been known as an important element of the healthcare system that provides both pharmaceuticals and services to the communities. However, in many developing countries including in Indonesia, the remuneration of pharmacist is often influenced by the financial viability of the pharmacy and price markup of the medicines. There is a need for a balance compensation that ensures sustainability of pharmacist services. Therefore, this study aims to provide an overview of pharmacist remuneration models in Indonesia.

Methods: A nationwide community pharmacy survey in form of electronic survey was conducted in 2019 involving 7,000 pharmacies in Indonesia. The survey was distributed across multiple social media platforms and throughout the network of Indonesian Pharmacist Association using accidental sampling technique. Questions around remuneration models and amounts, types of incentives and other financial benefits structured the questionnaire. Descriptive analysis was used to evaluate the findings.

Results: Of 2,087 pharmacists participated in the survey, only 1,952 respondents were recorded. The majority of participants are female (78%) with half of them had experience of working as community pharmacist within the past 10 years (50%). More than half of respondents did not receive any particular fees designated to compensate provision of cognitive services (50%). Fixed monthly salary predominantly formed the structure of remuneration system with less than half of the respondents (46%) received additional incentives to top up this monthly salary.

Conclusion: The current remuneration system which mainly relies on monthly salary basis may not be sustainable to support provision of pharmacist-led cognitive services. Other remuneration models in form of pay for performance and fee for services can be an alternative for pharmacist financial package.

Keywords: *pharmacist, remuneration, community pharmacy, survey*

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CP-102

Understanding the characteristics of pharmacy and workforce in community pharmacy: an insight for practice change

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Abstract

Background: The inevitable changing landscape of health and pharmacy sector has preserved a constant pressure for community pharmacy to change. Practice change, however, is not an easy task as it may require an overhaul to the pharmacy operation and workforces. This might imply an imperative to understand the pharmacy and its workforces prior to ignite some changes. Therefore, this study aims to report the characteristics of community pharmacy and workforces in Indonesia to show the potentials for pharmacy to change.

Methods: A nationwide online survey was conducted between September 2018 and May 2019 recruiting 7,000 pharmacies across all 34 provinces in Indonesia. Accidental sampling was used with participants were required to complete a questionnaire asking for the types and operation of community pharmacy as well as the profile of workforces working in their pharmacies. The results were analyzed descriptively.

Results: 1,952 pharmacists participated in the survey. Most of the respondents were female (78%) with majority were younger than 40 years (87%). The majority of pharmacies were owned by non-pharmacist (79%) with more than half were operated close to other medicine outlets (62%). A large number of pharmacies were operated independently (82%). Most pharmacies only had one pharmacist (82%) and employed additional non-pharmacist workforce (91%) mainly technicians. The non-pharmacist workforces involved in a number of activities from ordering medicine (47%) to deliver medicine to patient's house (48%).

Conclusion: The community pharmacy in Indonesia mainly operates as small sized enterprises. An emerging concern is how such type of pharmacy can pursue and attain greater employment flexibility and introduce organizational change under non-pharmacist ownership.

Keywords: *community pharmacy, management, workforce, practice change*

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CP-103

The impact of pharmacist shortage on the inventory management of medicines in Primary Healthcare Centres

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Abstract

Background: In many countries, including Indonesia, pharmacist is the only authorized person for the inventory management of medicines. However, in the case of pharmacist shortage, other personnel may take over this function leading to a question whether such practice may affect the efficiency and accuracy of the inventory management. This is particularly the case in most Primary Healthcare Centers (PHCs) in Indonesia. Therefore, this study compared the outcome of practice between pharmacist and non-pharmacist in the inventory management of medicines.

Methods: An observational study to 146 PHCs in East Java was conducted involving 73 pharmacists and 73 non-pharmacist staffs, respectively. This study was conducted from July to October 2019. Each respondent completed a questionnaire focusing on the inventory aspects in the management of medicines such as stock amount, purchasing accuracy and storage system.

Results: There was a significant contrast in term of outcome between pharmacist and non-pharmacist when managing the inventory of medicines in the PHCs. Purchasing accuracy is higher for pharmacist (90%) as compared to non-pharmacist (68%). As a result, pharmacist manages the inventory more efficiently with only 2% of the drugs were wasted and expired, respectively. In contrast, non-pharmacist staff contributed to 16% of drugs were eventually wasted and 18% of drugs were expired, respectively. As a consequence, cost for inventory of medicines was higher in the PHCs in which pharmacist is not available.

Conclusion: The role of pharmacist in the inventory of medicines is vital as it may contribute to better efficient and accurate management of medicines.

Keywords: *pharmacist, inventory, management, medicine*

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CP-104

Sleep quality and quality of life of Malaysian pharmacy undergraduate students

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Abstract

Background: Having a good sleep may help to protect one's mental and physical health and quality of life. University students, especially those in professional courses, tend to have poor sleeping pattern due to the nature of their academic requirement. This study aims to determine the sleep quality of pharmacy students in a public university, its associated factors and their quality of life (QoL).

Methods: A cross-sectional study was conducted using questionnaires involving undergraduate pharmacy students in Universiti Sains Malaysia. The Pittsburgh Sleeping Quality Index (PSQI) was used to determine the sleep quality, while quality of life was determined using Short Form-36 Survey (SF-36). Poor sleepers were defined as having PSQI score of <5. Independent t-test and Chi-square test were used to compare between variables.

Results: A total of 256 participants completed the questionnaires. Majority (n=215, 84%) of the participants were poor sleepers. There was a statistically significant association between sleeping quality and year of study (p=0.004) and credit unit taken by students (p=0.011). Stress may be one of the factors that affect sleeping quality in pharmacy students. Mean score for QoL in seven domains was 61.5 ± 20.1 . Participants were shown to have a good physical functioning, with mean score of 87.2 ± 18.4 , while the lowest mean score was found in 'energy or fatigue' domain (47.0 ± 16.8). There was no significant difference in the seven QoL domains between poor and good sleepers.

Conclusion: Majority of pharmacy students in our study population had poor sleep quality, and a higher credit unit was a factor for poor sleep quality. For QoL, participants had good physical functioning but poor in vitality.

Keywords: *sleeping pattern, undergraduate pharmacy, PSQI, SF-36*

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CP-105

Evaluation of vaccination knowledge and perception among pharmacy undergraduates in a public university in Malaysia: A cross-sectional study

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Abstract

Background: Several vaccination studies have been conducted within universities in Malaysia on the knowledge and attitude among pharmacy undergraduates focusing on Human Papillomavirus (HPV) vaccine. However, there has not been a generalized study to assess the knowledge and perception on vaccination in general. Due to expansion of pharmacist role in vaccination advocacy, the study aims to access the knowledge and perception of Universiti Sains Malaysia (USM) pharmacy undergraduates, including the source of information on vaccination before proving the importance for the inclusion of the topic in the curriculum.

Methods: A cross sectional study using a validated and pilot-tested 43-itemed questionnaire was conducted among pharmacy students in USM. The questionnaire contains 4 domains including demographic data, knowledge on vaccination, perception towards vaccination and source of information on vaccination.

Results: Three hundred and eleven students (311) participated and completed the questionnaire, where females were majority of the respondents (76.5%). Overall, 72.1% of the students had been classified using Bloom's cut-off point as having fair knowledge score (5-8). Majority (90%) of the students had good perception towards vaccination. Online resource shown to be the most search source of information on vaccination (84.2%) with the least from the religious/community leader (10.9%).

Conclusion: Pharmacy undergraduate students were shown to have fair knowledge and good perception towards vaccination, suggesting the need of implementing vaccination content delivery in the existing curricula to ensure better understanding and practice towards vaccination advocacy.

Keywords: *vaccination, pharmacy undergraduates, knowledge, perception, questionnaire.*

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CP-106

Knowledge and Perception among Pharmacists Towards Human Immunodeficiency Virus (HIV) Pre-Exposure Prophylaxis (PrEP) In A Public Hospital In Malaysia

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Abstract

Background: Pre-exposure prophylaxis (PrEP) is one of the effective methods of preventing HIV which involves taking anti-retroviral medication daily by an uninfected individual. Pharmacists play an important role in implementing PrEP in Malaysia. However knowledge and perception among pharmacists in Malaysia on PrEP is still unknown. Hence it is important to assess the level of knowledge and perception of pharmacists towards PrEP.

Method: Cross-sectional, validated, self-administered 34-itemed questionnaire was carried out among pharmacists from January 2020 until February 2020.

Results: One hundred four (104) pharmacists responded with a majority were females (84.6%) and have experience in dealing with HIV patients (67.3%). Overall, 46.2% of the respondent had low level of knowledge, and 15.4% had high level of knowledge. High level of knowledge was associated with pharmacists working in ward and those who had completed HIV related course in the past 2 years (62.6%, n = 34). While low level of knowledge was associated with pharmacists who had less than 1 year working experience (83.3%; p -value=.04) and those without experience with HIV patients. Most of the pharmacists had fair level of perception (64.4%). Level of knowledge were significantly positively correlated with perception level (p -value: < 0.05, r = 0.214). The preferred training methods source of information on HIV PrEP and updates were through attending courses/workshop (56.7%) and through guidelines (66.3%).

Conclusion: Pharmacists working in the hospital generally had a low level of knowledge towards PrEP in HIV with a fair level of perception and provided with appropriate training and resources may improve their knowledge about PrEP and reduce their misconceptions towards PrEP.

Keywords: *Pre-exposure prophylaxis (PrEP), HIV, pharmacist, knowledge, perception.*

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CP-107

Study of dysglycemia effect in hospitalized diabetes melitus patients using injection of ciprofloxacin or levofloxacin with oral antidiabetic or insulin

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Abstract

Backgrounds: Fluoroquinolone is a broad spectrum antibiotic that is often prescribed for the treatment of infections. One of the side effects of fluoroquinolone antibiotics is impaired glucose homeostasis. Hypoglycemic and hyperglycemic can occur during therapy using fluoroquinolone antibiotics. Therefore, it is necessary to monitor the use of fluoroquinolone antibiotics, especially in patients with diabetes mellitus. This study was aimed to determine the dysglycemia effects of fluoroquinolone antibiotics, namely ciprofloxacin or levofloxacin in hospitalized diabetes melitus patients who also taking oral antidiabetic or insulin in Lasinrang Hospital Pinrang by measuring blood glucose levels value before and after using fluoroquinolon.

Methods: The research was conducted by a non-experimental observational study with a descriptive-analytic design. Sampling was done by retrospectively method and 49 samples were obtained that met the inclusion criteria.

Results: The results of this study showed no hypoglycemia effect in hospitalized diabetes melitus patients, who was taking ciprofloxacin or levofloxacin. The percentage effect of hyperglycemia that occurs in patient using ciprofloxacin was 34.78% and levofloxacin was 34.61%.

Conclusion: Based on the multivariate analysis using the *Pearson* method, the factors that influence changes in blood glucose levels are age, duration of drug use (days), frequency within 24 hours (mg), total consumption (mg), drug dose (ml), and drug level (mg).

Keywords: *dysglycemia, ciprofloxacin, levofloxacin, blood glucose level*

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CP-108

Analysis of Gastric Ulcer Drug Regimentation In Surgical Patients

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Abstract

Background: Gastric ulcers are disorders in the form of ulcers on the mucosal surface of the digestive tract. The World Health Organization estimates that more than 50% of drugs are prescribed incorrectly. Giving ulcer drugs in a wrong dose and frequency is considered irrational. This can result not maximized therapy. This study was conducted to analyze the regimentation of ulcer drug.

Methods: This cross-sectional study was conducted for 4 weeks in 2019 in the surgical inpatient room of Dr. Soetomo Hospital. The study population was ulcer drugs used in surgical inpatients at Dr. Soetomo Hospital. The sample is an ulcer medication that is used with medical indications.

Results: From 1,404, only 730 units of ulcer drug dose were analyzed in this study because they were used according to medical indications. More than 60% of ulcer medications are used in incorrect regimens.

Ranitidine injection of 50 mg twice a day occupied the largest proportion of inaccurate regimentation of all ulcer drug dose units, namely 54.25%. All ranitidine tablets were correctly regimented. More than 60% of the unit dose of omeprazole and the entire use of sucralfate was declared inappropriately regulated

Conclusion: There is inappropriate regiments in the usage of ulcer drugs. Further research is needed to explore the effect of drug dose regimentation on therapeutic effects on patients.

Keywords: *gastric ulcer, ulcer drug, incorrect regimentation*

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CP-109

The development and validation of the Health Belief Model questionnaire for measuring factors affecting adherence in the elderly with hypertension

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Abstract

Background: Medication adherence is a behaviour that needs to be considered in elderly with hypertension. Evidence has shown that generally, the elderly have a low level of adherence due to forgetfulness and lack of knowledge. This study aimed to validate the health belief model questionnaire to measure health beliefs that could affect adherence in the elderly with hypertension.

Methods: The questionnaire was developed based on the literature review and discussion with experts. The questionnaire then distributed through social media. Participants who met the following criteria were asked to participate in the study: (1) aged 60-79 years. (2) had anti-hypertensive medications in the last three months (3) possessed a mobile phone with an active number. The questionnaire consists of six domains: perceived susceptibility, perceived severity, perceived threat, perceived benefits, perceived barriers, and perceived self-efficacy. The results were grouped by domain and tested for reliability and validity using SPSS ver.24.

Results: Thirty participants completed the questionnaire. Each domain was tested for its reliability and validity at a significance level of 0.05. The result shows that each domain had a Cronbach's Alpha value greater than 0.07, with the overall score was 0.89 showing that all domains in the questionnaire were reliable. Furthermore, from 49 items in the questionnaire, only two items that invalid while the rest of the items showed its validity based on the Pearson Correlation ($> r$ table 0.361; $p < 0.05$).

Conclusion: This self-administered health belief model questionnaire was a valid and reliable instrument to assess health beliefs in elderly with hypertension.

Keywords: *Adherence, elderly, health belief model, hypertension.*

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CP-110

The potential role of pharmacist in counteracting health misinformation in social media

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Abstract

Background:The increasing number of Social Media (SM) user dan its frequent use has an impact toentire aspects of life, including healthcare. Accordingly, health misleading information is often circulated leading to confusion and jeopardizing patient's health. This study aimed to identify the role of pharmacist in responding to health misinformation in SM.

Methods:Several Focus Group Discussions (FGDs) were conducted in four cities in Indonesia with pharmacist as participant. The participants were purposively recruited following to the recommendations from the Local Pharmacist Association. The discussions were audiotaped, subsequently transcribed and thematically analyzed.

Results:41 pharmacists participated in this study. Four broad themes were identified: type of health misinformation in SM, effect of the misinformation, pharmacist response to misleading information and pharmacist role expectation in counteracting health misinformation. The most frequent misleading information in SM was related to herbal medicine. The misinformation tended to increase noncompliance to medication therapy, a delay in treatment, dan worsen the illness. Some of the respondents clarified the misinformation byshowing the appropriate references, while theremaining had difficulty particularlyto seek reliable references which are related to the use of traditional and alternative medicine. Respondents claimed that the general public often asked for advice and opinion related to information circulated inSM.

Conclusion:Pharmacists need to actively counteract the health misinformation in SM.However, lack of reference to particular issue is often a major obstacle to play such role. This might imply a shared coordination with other pharmacists.

Keywords: *health information, misleading information, pharmacist, social media*

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NP-01

Green Tea with its active compound EGCG Inhibit Neuronal Apoptosis in Middle Cerebral Artery Occlusion (MCAO) model

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Abstract

Background: ischemic stroke is the leading cause of disability in adults. During ischemic stroke, oxidative stress occurs and causes neuron cell death through apoptosis pathway. Green tea with the active compound EGCG has strong anti-oxidant properties that will reduce oxidative stress on neuron cells during ischemic event.

Objective: to know the effect of green tea with the active ingredient EGCG on the inhibition of apoptosis in the MCAO model

Methods: Male Rattus Norvegicus 4 months years old with body weight of 200-275 grams was carried out by MCAO model and divided into 5 groups and the treatment was carried out for 7 days. Before being sacrificed, the subject had 1 cc of blood drawn for HMGB1 examination using ELISA, and after being sacrificed, the brain tissue specimen was taken to examined Caspase-3 and BCL-3 using Immunohistochemistry methods.

Result: There was no significant difference in HMGB1 results for the treatment group compared to the control group (P1: 384,20±231,72 (p = 0,553); P2: 379,11±268,4 (p = 0,526); P3: 284, 87±276.19 (p = 0.140); P4: 435.32±279.95 (p = 0.912). There is significant increasing in BCL-2 expression between treatment group compared to the control group (P1: 2.58±0.51 (p = 0.04); P2: 3.36±0.50 (p <0.001); P3: 4.00±0.42 (p <0.001); P4: 3.60±0.52 (p <0.001). There was a significant difference in Caspase-3 expression compared to the control in the P3 group (P1: 4,33±0,49 (p = 0.652); P2: 4.09±0.30 (p = 0.136); P3: 3,58±0.51 (p = 0.01); P4: 3.89±±0.42 (p = 0.063).

Conclusion: green tea with the active ingredient EGCG can inhibit neuron cell death through the apoptotic pathway not through the activation of HMGB1

Keywords: MCAO, green tea, EGCG, HMGB1, Caspase-3, BCL-2

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NP-02

Assessment of Phytochemical and Anthelmintic Activity of Some Selected Ethnomedicinal Plants from Barak Valley Region of Assam

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Abstract

Background: Since ancient times it has been observed that the ethnomedicinal knowledge is backbone of rural healthcare. The traditional healers of Barak Valley region of Assam used traditional medicine for the treatment of various diseases including helminths infection. Hence the current study was planned to explore the traditional medicines namely *Justicia adhatoda*, *Vernonia amygdalina*, *Mikania micrantha* and *Momordica charantia* used as anthelmintic activity by the local people of Barak Valley region of Assam.

Methods: The decoction of leaves of *Justicia adhatoda*, *Vernonia amygdalina*, *Mikania micrantha* and *Momordica charantia* were prepared for the phytochemical studies and anthelmintic activity.

Results: The phytochemical study demonstrated the presence of flavonoids, tannins, phenolic compounds, alkaloids and glycosides in *Justicia adhatoda*, *Vernonia amygdalina*, *Mikania micrantha* and *Momordica charantia*. The *Justicia adhatoda*, *Vernonia amygdalina*, *Mikania micrantha* and *Momordica charantia* showed significant anthelmintic activity by inducing mortality of earthworm *Pheritima posthuma*.

Conclusion: The above findings confirmed the ethnobotanical uses of these plants as an anthelmintic by local people of Barak Valley area of Assam.

Keywords: *Anthelmintic activity, Phytochemical, Justicia adhatoda, Vernonia amygdalina, Mikania micrantha, Momordica charantia*

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NP-03

Transethosome gel of orange (*Citrus sinensis* L.) peel extract for atherosclerosis prevention by total cholesterol reduction

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Abstract

Background: Orange peel contains flavonoid such as hesperidin, neohesperidin, naringin, and nobiletin that have activity as anti-atherosclerosis. Their mechanism occurs by decreasing LDL levels and atherosclerotic plaques, as well as increasing HDL and collagen levels. The aim of this article review was to utilize orange peel extract in the prevention of atherosclerosis.

Methods: The method of this study was a literature review. Online databases such as PubMed, ScienceDirect, and Google Scholar were used to search literature with the keywords of “*Citrus sinensis* peel and extraction and flavonoid”; “*Citrus sinensis* peel and atherosclerosis”; “hesperidin and atherosclerosis”; “naringin and atherosclerosis”; “nobiletin and atherosclerosis”; “*Citrus sinensis* and transethosome”; “flavonoid and transethosome”; “atherosclerosis and transethosome”; “phospholipon systemic and transdermal”; “sodium cholate and function”; “transethosome solvent and transdermal”.

Results: The extract of orange (*Citrus sinensis* L.) peel inhibited atherosclerotic lesions formation by reducing cholesterol accumulation and foam cell formation in peritoneal macrophages. This study showed that hesperidin and other flavonoids in the orange peel are less water-soluble and has low lipophilicity. Modification of transethosome gel with surfactant from orange peel extract increases skin penetration through systemic absorption. The use of surfactants makes the extract of orange peel penetrates into systemic. Topical application near aorta by active compounds in orange peel extract can reduce cholesterol accumulation in aortic macrophages and lead to atherosclerotic lesion formation.

Conclusion: The orange peel extract can be applied to an effective transethosome gel with the prediction to prevent atherosclerosis.

Keywords: *atherosclerosis, flavonoid, orange peel, transethosome gel*

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NP-04

Antiplasmodial activity of *Detarium microcarpum* (Fabaceae) stem bark extract

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Abstract

Background: Malaria is an infectious disease transmitted by the bites of female *anopheles* mosquitoes infected with *Plasmodium* specie. It is prevalent in the tropical and sub-tropical areas of the world, estimated to kill one million individuals annually. Children (below 5 years), pregnant women, sicklers, patients with HIV/AIDS as well as non-immune immigrants are considerably at higher risk of contracting malaria infection and developing severe complications. *Detarium microcarpum* Guill. & Perr. (Family: Fabaceae) is used traditionally in the treatment of malaria, diabetes, hypertension, measles, convulsions, pneumonia, leprosy, meningitis. The aim of this study is to evaluate the antiplasmodial activity of methanol stem bark extract of *Detarium microcarpum*.

Methods: Phytochemical screening and oral median lethal dose (LD₅₀) estimation of the extract were carried out. The antiplasmodial activity was evaluated in mice infected with chloroquine sensitive *plasmodium berghei-berghei* using curative, suppressive and prophylactic experimental animal models. Data were analysed using ANOVA followed by Dunnett's post hoc test (SPSS Statistics for Windows, version x.0).

Results: Phytochemical screening of the extract revealed the presence of alkaloids, flavonoids, saponins, tannins, triterpenes and glycosides. Oral LD₅₀ was estimated to be 3800 mg/kg. The extract at all the doses (200, 400, 800 mg/kg) tested produced a significant ($p < 0.001$) curative, suppressive and prophylactic effects and significantly prolonged the survival time of the treated mice up to 22 days compared to the negative control group (5 days).

Conclusion: The results of this study suggest that the stem bark extract of *Detarium microcarpum* possesses curative, suppressive and prophylactic antiplasmodial activity at the doses tested, thus support the ethno-medicinal use of the plant in the treatment of malaria infection.

Keywords: *Detarium microcarpum*, antiplasmodial, *plasmodium berghei-berghei*, chloroquine, artesunate

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NP-05

Effect of Combination Electrolyzed Reduced Water and EGCG (Epigallocatechin-3-Gallate) on RANKL expression and Osteoclast Number in Orthodontic Teeth Relapse

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Abstract

Objectives: to investigate effect of combination Electrolyzed Reduced Water (ERW) and EGCG (Epigallocatechin-3-Gallate) on RANKL expression and osteoclast number in orthodontic teeth relapse.
Material and methods: 36 *Rattus Novergicus* samples were divided into 6 groups and given combination ERW and EGCG for 14 days. The rats were euthanized on days 7 and 14 with the maxilla bone subsequently removed for immunohistochemistry examination. RANKL expression were evaluated by immunohistochemical staining, the osteoclast number determined with the aid of haematoxylin-eosin stain.

Result: Combination ERW and EGCG inhibit RANKL expression and osteoclast number on days 14 post debonding.

Conclusion: Combination ERW and EGCG inhibit RANKL expression and osteoclast number in orthodontic teeth relapse. Combination ERW and EGCG is a potential therapy enhancing bone remodeling in patients with orthodontic tooth movement.

Keyword: *Epigallocatechin-3-Gallate; Electrolyzed Reduced Water; Osteoclast; RANKL; Relaps Orthodontic*

NP-06

Effects of honey as body defense from *Toxoplasma gondii* infection

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Abstract

Background: *Toxoplasma gondii* infection may cause liver derrangement and on the other hand honey has an ability in repairing damage of liver tissue due to disease process. This recent study has been made to find out the influence of honey to overcome the histopathological changes of liver caused by toxoplasma infection.

Methods: Twenty-five male mice of 2-3-month-old were divided into five groups id est P0, P1, P3 and P4. P0 as a control group was administered with 0,2 ml normal saline solution intraperitoneally, while the P1 with 0,08 ml dorsata honey orally. P2, P3 and P4 were infected with 1×10^3 of *T. gondii* intraperitoneally. Before this treatment, P3 and P4 were given dorsata honey 0.08 ml and 0.12 ml respectively. Four days post infection all of mice were sacrificed and the liver were subjected for microscopic examination with H&E staining.

Results: Scoring method under Mordue was applied to the 3 histological changes, that were degeneration, necrosis and celullar infiltration. Then the result analyzed by Kruskal Wallis and followed by Mann Whitney test.

Conclusion: There were so significantly different among the groups ($p < 0.05$), that the conclusion was there a reduced damage of the liver and the more effective dose was 0.12 ml.

Keywords: *toxoplasma gondii*, *toxoplasmosis therapy*, *liver histopathology*, *honey*

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NP-07

MDA levels and liver histopathology recovery after per oral administration of *Echinometra mathaei* ethanol extract on wistar rats induced by paracetamol

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Background: *Echinometra mathaei* (EM) known as sea urchins, is one type of sea urchins that commonly found in the Indonesian marine waters. EM was known to have anti-inflammatory, antihyperglycemic, and antioxidant activities. EM also contains polyhydroxy naphthoquinone (echinochrome and spinochromes), that potential as an antioxidant. The antioxidant properties contributed to the hepatoprotective effect by binding to free radicals compound that causes oxidative stress and necrosis in the hepatocytes.

Aim: This research aimed to determine the hepatorepair effect of EM extract on *Rattus norvegicus* rats induced by high doses of paracetamol through the determination of tissue malondialdehyde levels and histopathology of necrosis liver cells.

Method: This research used a true experimental method with a post-test control group design. Thirty white male rats divided into sixth groups, i.e: negative control group and group II-VI was induced paracetamol 2000mg/KgBW for three days. After paracetamol-induced, group II-VI was treated with curcumin 5,4mg/KgBW, EM extract 400mg/KgBW, EM extract 800mg/KgBW, EM extract 1200mg/KgBW for 7 days. The hepatorepair parameter obtained from the MDA tissue levels and the number of necrosis cell hepatocyte. The data results were analyzed using the ANOVA test followed by LSD test to determine the difference between each treatment.

Result: The results showed that *Echinometra Mathaei* significantly ($P < 0.05$) decreased the MDA levels and the number of hepatic necrosis cells at the dose of 800 mg/kg BW.

Conclusion: *Echinometra mathaei* proved to repair the hepatotoxicity induced by drugs.

Keywords: *Echinometra mathaei*, Sea urchin, Malondialdehyde, Necrosis, Paracetamol-induced hepatotoxicity, Hepatorepair

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NP-08

Pharmacokinetic Interaction of Binahong (*Anredera cordifolia* (Ten.) Steenis) leaves extract and Glibenclamide in Rat

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Abstract

Background: Our previous study showed that there was pharmacodynamics interaction between Glibenclamide and Binahong extract. We found that when Glibenclamide and Binahong extract were administered together, It showed different concentration in amino acids and fatty acids in rat serum. Therefore, we proceeded to analyze it combination in pharmacokinetics model.

Methods: To this end, we administered rats with glibenclamide with and without Binahong extract at the same time or with time lag. The plasma was collected from 0 – 36 hours after administration. We then determined and analyzed glibenclamide in rat plasma using Ultra High-Performance Liquid Chromatography (U-HPLC).

Results: In group of rat that treated only with glibenclamide, showed that maximum concentration of glibenclamide in plasma is 24 hrs after administration. The combination of glibenclamide with Binahong extract that administered at same time showed decreased of maximum concentration dan area under curve. The administration of Binahong extract with 1 hr lag time ahowed similarresult

Conclusion: As a conclusion, the administration of Glibenclamide or Binahong extract showed effectively reduced blood glucose in rat model of Diabetes Mellitus. But the combination of glibenclamide and Binahong extract showed worsed effectiveness in rat model. This could be explained caused by interaction in pharmacokinetics too besides of pharmacodynamics interaction.

Keywords: binahong, *Anredera cordifolia*, pharmacokinetic interaction, diabetes mellitus, ultra high-performance liquid chromatography

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NP-09

Effects of Kemuning (*Murraya paniculata* L.) Leaves Extract on the Pharmacokinetic of Simvastatin in Rat

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Abstract

Background: In previous study, we found that Kemuning extract could improve lipid profiles of dyslipidemia rat as effective as simvastatin. The combination of kemuning extract and simvastatin showed worse result compared with the single administration of each. Therefore we proceeded to analyze it combination in pharmacokinetics model to evaluate its interaction.

Methods: To this end, we administered rats with simvastatin with and without Kemuning extract at the same time or with time lag. The plasma was collected from 0 – 12 hours after administration. We then determined and analyzed simvastatin in rat plasma using Liquid Chromatography Tandem-Mass Spectrometry (LC– MS/MS).

Results: In group of rat that treated only with simvastatin, showed that maximum concentration of simvastatin in plasma is 4 hrs after administration. The combination of simvastatin with Kemuning extract that administered at same time showed suppressed of maximum concentration dan area under curve of simvastatin.

Conclusion: As a conclusion, the administration of simvastatin or Kemuning extract showed effectively improved lipid profile in rat model. But the combination of simvastatin and Kemuning extract showed that kemuning extract suppressed simvastatin so that the effects become worse than single administration.

Keywords: *kemuning, Murraya paniculata* L., *pharmacokinetic interaction, hypercholesterol, Liquid Chromatography Tandem-Mass Spectrometry*

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NP-10

Potency ratio of fermentation filtrate of yellow passion (*Passiflora edulis* var. *Flavicarpa*) fruit pulp to antibiotics standard against *Staphylococcus aureus*, *Escherichia coli* and *Bacillus subtilis*.

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Abstract

Background: Yellow passion (*Passiflora edulis* var. *Flavicarpa*) fruit is the fruit of a local plant that grows abundantly in Indonesia with various health benefits. The active ingredients in the pulp have been reported, including lactic acid bacteria and probiotics, which are known to have advantages, especially as antimicrobials. This study will evaluate the potential ratio of the filtrate resulting from fermentation of passion fruit pulp in De Man Rogosa and Sharpe (MRS) media to the standard of kanamycin and streptomycin against *Staphylococcus aureus*, *Escherichia coli* and *Bacillus subtilis*.

Methods: Fresh passion fruit weighed as much as 5 grams of pulp, fermented in the MRS medium for 24 hours at 37°C in a shaker incubator. The fermentation broth was filtered and the filtrate was tested for its inhibitory activity against *S. aureus*, *E. coli*, and *B. subtilis* using agar diffusion method on nutrient agar test media. The potency ratio to kanamycin and streptomycin standards was calculated using a 3x3 random block design.

Results: The inhibitory ratio of the fermentation filtrate varied depending on the tested microbes and the standard of antibiotics. The growth inhibitory activity of the fermentation filtrate at a concentration of 100%/250 µL against *S. aureus*, *E. coli* and *B. subtilis* were equivalent to kanamycin and streptomycin above their MIC and categorized as strong potency.

Conclusion: The fermented filtrate of yellow passion fruit pulp in MRS media has the potential to be developed as a candidate of raw material source for antibacterial agent.

Keywords: *potency ratio, fermentation filtrate, passion fruit, streptomycin, kanamycin*

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NP-11

***Cratoxylum sumatranum* subfractions exhibited antimalarial activity by Lactate Dehydrogenase (LDH) assay**

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Abstract

Background: The antimalarial drug resistance is an obstacle in the effort to overcome malaria. New alternative antimalarial drug was become in high attention of urgent need. Current antimalarial drugs were derived from plants. Therefore, plant is considering as a source of new drugs. *Cratoxylum sumatranum* stem bark dichloromethane extract was reported to inhibit *Plasmodium falciparum* growth by Lactate Dehydrogenase (LDH) assay. The Fraction-6 was the most active fraction with Inhibitory Concentration 50% (IC₅₀) value of

0.12 µg/ml. This study aims to obtain the active subfraction from Fraction-6 of *C.sumatranum* stem bark. **Methods:** Fraction-6 was fractionated using preparative Thin Layer Chromatography (prep-TLC) method on RP18 plate with methanol-water (9:1) mixture as an eluent. All of subfractions were tested by LDH assay and were followed by IC₅₀ determination.

Results: Two of ten subfractions of Fraction-6 were showed potential antimalarial activity by LDH assay. The active subfractions were subfraction-4 and subfraction-7 with IC₅₀ value of 0.35±0.02 µg/ml and 0.74±0.02

µg/ml respectively. Phytochemistry screening showed that subfraction-4 and subfraction-7 contain xanthone compounds.

Conclusion: Subfraction-4 showed the strongest antimalarial activity among ten subfractions. The active xanthone compound in subfraction-4 suggested to be further isolated to obtain the identified active compound which take a role in antimalarial activity of *C.sumatranum*.

Keywords: *Cratoxylum sumatranum*, subfraction, antimalarial, LDH assay

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NP-12

Review Plant Extract *Elephantopus Scaber* Linn and probiotic of natural feed additives as alternative to an Antibiotic Growth Promotes (AGP) In Broiler diets.

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Abstract

Background: Antibiotic Growth Promoter (AGP) is an antibiotic added to feed that aims to eliminate that damage the digestive tract with the hope of getting a better body weight and feed conversion ratio. However, the use of AGP has been known to cause residue in humans, who consume the processed chicken meat, this is because AGP can cause bacteria resistant to antibiotic that are consumed by human. *Elephantopus Scaber* Linn extract has an effective antibacterial compound that can inhibit the growth of pathogens and carbohydrates which can be used by probiotics to increase growth. This review journal summarizes the most recent research regarding antibacterial effect from extract *Elephantopus Scaber* Linn and to investigate the potential effect of the natural feed additive *Elephantopus Scaber* Linn as alternative to an Antibiotic Growth Promoter. This journal review was conducted as a basis for evaluating the possible use of *Elephantopus Scaber* Linn extract and probiotic in the use of natural ingredients as a substitute for AGP.

Methods: This review was conducted through searching publication about *Elephantopus Scaber* Linn with anti antibacterial activity and probiotic as an alternative for possible AGP in database literature PubMed, SCOPUS, ScienDirect, Google Scholar, Cochrane Central Register of Controlled Trials (CENTRAL) and Repository University of Airlangga with *Elephantopus Scaber* Linn. keyword search articles. The antibacterial activity of the extract will be used to increase the potency of the probiotic. This plant extract is able to inhibit pathogenic bacteria and support the growth of probiotic candidates by measuring the optical density (DO) value. using a *micropalate reader* to determine the MIC value. And MIC values are used to determine the MIB value by *lawning* technique. Inhibition ability of probiotic candidates against pathogens was tested using the *disk diffusion* method.

Results: *Elephantopus scaber* Linn has been scientifically proven by in vivo tests to have antibacterial activity

Conclusion: This study highlights several studies on *Elephantopus Scaber* Linn that show the effectiveness and safety of natural food additives as an alternative to using AGP in broilers.

Keywords: *Elephantopus Scaber*, probiotic, growth promoter, AGP

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NP-13

Antioxidant activity, phenolic and flavonoid contents in the leaves extract of purple sweet potatoes (*Ipomoea batatas* (L.) Antin-3 varieties in different ethanol concentration as a solvent

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Abstract

Background: Purple sweet potatoes (*Ipomoea batatas* (L.) Antin-3 variety is the newest variety which has high anthocyanin content and can be used as an antioxidant source. The purpose of this study is to obtain data of polyphenol, flavonoid and antioxidant activity of Antin- 3 leaves, which have been extracted by kinetic re- maceration using different concentration of ethanol: 50 %, 70 % and 96%.

Methods: Total phenolic determination in this study used gallic acid as a standard, while total flavonoid determination used quercetin. DPPH was used to determine the free-radical scavenging activity of the Antin- 3 leaf extract and vitamin C as a control. All of that determination using UV-Vis Spectrophotometer.

Result : The results showed that the polyphenol content of 50%, 70 % and 96% ethanol of Antin-3 leaf extract in row were 19,17±0, 30 %; 16,98±0,77 %; 13,17±0,37 %, while the flavonoid content in row were 4,94± 0,23%; 4,83± 0,07%; 4,47± 0,15 %. The value of antioxidant activity was represented by IC 50 value. IC 50 of 50%; 70 % and 96% ethanol of Antin-3 leaf extract in row were 56,19 ppm; 47,99 ppm and 64,10 ppm. IC 50 value of vitamin C was 20,18 ppm.

Conclusion: The 50 % ethanol Antin-3 leaf extract produces the highest polyphenol and flavonoid content. The higher water content in the solvent, the greater secondary metabolites are, especially for polyphenol and flavonoid. Also, the smaller IC 50 value of extract, the higher antioxidant activity could be. The 70 % ethanol Antin-3 leaf extract has highest antioxidant activity. Antioxidant activity of Antin-3 leaf extract is not only from the content of polyphenol and flavonoid, but also from oil solubility nutrition such as vitamin E and beta-carotene.

Keywords: *Antin-3 leaf extract, polyphenol, flavonoid, ethanol concentration, IC 50*

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NP-14

Acetylcholinesterase Inhibitory Activity of Extract and Fractions from Root of *Rauvolfia serpentina*(L.) Bth.ex Kurz

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Abstract

Background: Alzheimer's disease is a degenerative brain disease characterized by confusion, behavior changes, decline memory and cognitive skills. One of the strategies in the treatment of Alzheimer's disease is to use acetylcholinesterase (AChE) inhibitors. The potency of plants containing alkaloids as cholinesterase inhibitors is quite high. The plant *Rauvolfia serpentina* is a major source of biologically active indole **alkaloids**. The aims of the current study are to determine the AChE inhibitor activity of the extract and fractions of *Rauvolfia serpentina* root as well as to determine the presence of alkaloid compounds.

Methods: Extraction was carried out by maceration method using ethanol, followed by liquid-liquid partition using n-hexane, ethyl acetate and n-butanol. Further fractionation was conducted by using vacuum liquid chromatography (VLC). The acetylcholinesterase inhibitory assays were performed by using Ellmann's method. TLC method was used to determine the presence of alkaloid compounds.

Results: The ethanolic extract of *R. serpentina* showed inhibition against AChE enzyme with an IC₅₀ value of 14.31 µg/mL. Amongst three fractions obtained, the n-butanol fraction showed the strongest inhibition with an IC₅₀ value of 5.99 µg/mL. VLC fractionation of the n-butanol fraction yielded 13 subfractions (VLC 1-VLC 13). Four out of 13 subfractions gave more than 80% inhibition against AChE, namely subfractions 4 – 7. The IC₅₀ values of subfractions 4 - 7 are 7.08 µg/mL, 4.87 µg/mL, 19.88 µg/mL and 47.22 µg/mL, respectively. The TLC screening of these subfractions suggested the presence of alkaloids.

Conclusion: The ethanolic extract as well as fractions of *R. serpentina* root are potential for AChE inhibitor. The alkaloid compound may be responsible for this activity.

Keywords: *Rauvolfia serpentina*, Alzheimer's Disease, Acetylcholinesterase Inhibitor

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NP-15

The Activity of Combination Virgin Coconut Oil and Ethanol Extract of *Artocarpus lacucha* Buch.-Ham. Leaves to Increase Proliferation On NIH 3T3 Cell Line

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Abstract

Background: Wound healing is a process involving many cells consisting of four stages namely hemostasis, inflammation, proliferation, and remodeling. *Artocarpus lacucha* Buch.-Ham, including the Moraceae family, which is known as a medicinal plant in the Southeast Asian region is commonly called jack Monkey and traditionally used as wound healing drugs. Virgin coconut oil (VCO) is obtained from the flesh of mature fresh coconuts fruit (*Cocos nucifera*) processed at low temperature or without heating. VCO have antimicrobial, wound healing and antiviral activities. This study aims to determine the effect of combination Virgin Coconut Oil (VCO) and ethanol extract of *Artocarpus lacucha* Buch.-Ham. Leaves to increase cell proliferation of NIH 3T3

Methods: *Artocarpus lacucha* Buch.-Ham. leaves powder was extracted by maceration method with ethanol 96% solvent. The effect of combination VCO and ethanol extract (EE) of *Artocarpus lacucha* Buch.-Ham. on proliferation was evaluated using the MTT method

Results: The best combination was showed at concentration 15 µg/mL (VCO) – 3.75 µg/mL (EE). The effect of best combination on cell proliferation after 24h, 48h, and 72h incubation found as viable cells are $114.53 \pm 0.62\%$; $118.25 \pm 0.72\%$ and $112.65 \pm 0.40\%$.

Conclusion: The results suggest that combination Virgin Coconut Oil (VCO) and ethanol extract (EE) of *Artocarpus lacucha* Buch.-Ham. Leaves provide effective as wound healing agent.

Keywords: *Proliferation, combination, Virgin Coconut Oil, Artocarpus lacucha., NIH 3T3*

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NP-16

THE EFFECT OF MANGOSTEEN PERICARP (*Garcinia mangostana* L.) EXTRACT MUCOADHESIVE GINGIVAL PATCH ON THE MDA LEVELS AND THE NUMBER OF MICRONUCLEI DUE TO PANORAMIC RADIOGRAPHY RADIATION

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Abstract

Background: Panoramic radiography is a low-dose x-ray radiation technique often used in dentistry to determine the diagnosis, treatment plans, and monitoring the results of treatments. It has ionizing radiation effect which cause free radicals formation that will initiate lipid peroxidation that produces malondialdehyde (MDA) which is used as an index of free radical body activity. The increase of free radicals activity in cells can initiate oxidative stress and cause tissue damage. Many studies have shown that antioxidants can protect cells from the damage caused by free radicals. Mangosteen's pericarp (*Garcinia mangostana*) contains xanthone as a bioactive component that has a high level of antioxidants. This study utilizes mucoadhesive gingival patches containing mangosteen's pericarp extract that facilitate the absorption of the bioactive substance in the gingival tissue that were exposed by radiation.

Purpose: To determine the effect of mangosteen pericarp's mucoadhesive gingival patch on the MDA levels and the number of micronuclei in gingival tissues due to panoramic radiography radiation.

Methods: 35 *Rattus norvegicus* samples were divided into 7 groups and were given mucoadhesive gingival patches. Then, the rats were exposed to x-ray radiation. The gingival tissues were taken for histopathological examination to determine the micronuclei number and TBARS Test for the MDA levels

Results: There were differences in MDA levels and micronuclei number between rats that were given mangosteen gingival patches and those that were not.

Conclusion: Application of mangosteen's pericarp mucoadhesive patches can reduce the MDA levels and the number of micronuclei in rat's gingival tissues due to panoramic radiography radiation.

Keywords: *Panoramic Radiography Radiation; Malondialdehyde (MDA); Micronuclei; Mucoadhesive Gingival Patch; Mangosteen Pericarp (Garcinia mangostana L.)*

NP-17

The effect of Tamarind Leaf (*tamarindus indica linn*) Extract on Insulin Levels and Homa-IR in Rats with Type 2 Diabetic Model

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Abstract

Background: It is known that seeds, leaves, and fruit in tamarind (*tamarindus indica liin*) plants have a high phenolic content and antioxidant activity. This study aims to analyze the effect of tamarind leaf extract on insulin and Homa-ir levels in rats with type 2 diabetes mellitus.

Methods: In an experimental study, 30 male wistar rats were divided into five groups. Group 1 (T2DM rats + standard diet and Aquades (G1)), group 2 (T2DM rats + standard diet + Acarbose (G2)), group 3, 4, and 5 were fed on standard diet tamarid leaf extract 28, 56, and 112 mg / KgBW / day. Provision of tamarind extract for 7 days. Insulin and Homa-IR levels were checked at days 0 and 7.

Result: After 7th day of intervention, the mean insulin level increased 490,5 ± 3,83 pg/ml in G2, 476,16 ± 11,26 pg/ml in G3, 493,16 ± 4,70 pg/ml in G4, 510,16 ± 6,17 pg/ml in G5, while G2 and G4 has the same effect in increasing insulin levels. Homa-IR levels decreased 6,93 ± 0,17 in G2, 7,16 ± 0,15 in G3, 7,01 ± 0,10 in G4, 6,72 ± 0,19 in G5. whereas the HOMA-IR level was significantly different from other groups (P=0.000).

Conclusion: tamarind leaves can increase insulin levels and decrease HOMA-IR in rats with type 2 diabetes mellitus model. Therefore, tamarind leaves can be an alternative herbal medicine for type 2 diabetes Mellitus.

Keywords: *Tamarindus indica Linn, Tamarind leaves, Type 2 diabetes mellitus, streptozotocin, Insulin Levels, Homa-IR*

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NP-18

The effects of quercetin on nicotine-induced reward effects in mice

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Abstract

Background: Tobacco smoking is a leading cause of preventable mortality and morbidity in the world. The complexity of nicotine dependency process includes withdrawal effect that triggers recurrence is being main problem. Quercetin commonly known as antioxidant, bind free radicals and modulate endogenous antioxidants through Nrf2 activations is expected as a potential agent to reduce the risk of nicotine dependence. This research aims to evaluate quercetin effects on reducing the risk of nicotine addiction.

Methods: Conditioned Place Preference (CPP) with a biased design was used to evaluate reward effects of nicotine in male Balb/C mice. Pre-conditioning test was performed on day-1; conditioning test was done twice daily on day 2-4 by administering quercetin (i.p) 50 mg/kg along with nicotine (s.c) 0,5mg/kg or Cigarette Smoke Extract (CSE) (s.c) contained 0,5mg/kg nicotine; and post-conditioning test was performed on day-5 continue with extinction test on day 6, 8, 10, 12 and reinstatement test on day-13. Duration of time that spent in each compartment was recorded and analyzed.

Results: Nicotine 0,5 mg/kg and CSE 0,5 mg/kg significantly induced reward effects ($p < 0.05$), even there was no decrease of reward effect during the extinction-reinstatement stage of the post-conditioning phase ($p > 0.05$), while quercetin 50 mg/kg both induced along with nicotine or CSE was able to inhibit the reward effect of nicotine ($p > 0.05$).

Conclusion: Quercetin reduced the risk of nicotine dependence and has a potential effect to be used as therapy for nicotine dependence, especially as a preventive agent.

Keywords: *quercetin, nicotine dependence, cigarette smoke extract, conditioned place preference*

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NP-19

Potential Active Compounds of Soursop Leaves (*Annona muricata*) to Prevent SARS-CoV 2 Infection

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Abstract

Background: In silico study shown that soursop seeds are predicted to be able to inhibit the proliferation of SARS-CoV 2 through inhibition of SARS-CoV nsp12 polymerase . This study to prove the inhibitory effect of Soursop leaves to SARS-CoV2 infection on the attachment and fusion process of viral membranes in host cells through in silico study.

Methods: This research is using a computational modeling research design (in silico). The active compounds of soursop leaves were taken from literature studies. The target proteins are the spike protein, membrane protein, envelope protein and nucleocapsid protein from SARS-CoV 2. The docking process uses a docking server. 3D visualization using the PyMol program. Drug control using Mefloquin. The bond affinity between the ligands and the target protein is measured based on the value of free binding energy, area of interface interaction, Ki value, and the number of similarities in bond positions. Descriptive data analysis comparing the affinity of the active compound of soursop leaves with the control.

Results: The results showed that the active compound of soursop leaves, namely nicotiflorine, rutin, and xylopine have affinity for target proteins. Nicotiflorine have affinity for all SARS-CoV2 protein target. Rutin has affinity for target protein spike protein, nucleocapsid protein and envelope protein SARS-CoV2, and Xylopine has affinity for membrane protein SARS-CoV2. The effectiveness of all active compounds in soursop leaves is lower than control.

Conclusion : The conclusions of this study indicate the potential of soursop leaves to inhibit SARS-CoV2 infection.

Keywords: *Soursop leaves, protein of SARS-CoV19, in silico*

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NP-20

Comparison of blood pressure reduction between treatments of steeping Red Ginger Rhizome (*Zingiberofficinale R.*) and steeping Binahong Leaves (*Anrederacordifolia (Ten.) Steenis*) in Healthy People with hypertension risk

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Abstract

Background: The potency of red ginger rhizome and binahong leaves has been known have antihypertensive effect and can be used in herbal medicine. The purpose of this study was to compare the effect of steeping red ginger rhizome and steeping binahong leaves on blood pressure reduction in healthy people with hypertension risk.

Methods: The research design is Comparative Quasy Experiment to measure pre-test and post-test blood pressure on treatment of 3 g / 200 ml steeping the red ginger rhizome and 3gr / 200 ml steeping binahong leaves. The number of respondents was 64 according to the inclusion criteria and had obtained the ethical clearance. The data were processed statistically.

Results: The results of the experiment showed that the S1 group had a significant difference in systolic blood pressure reduction compared with the control treatments ($P < 0.05$), but there was no significant difference in diastolic blood pressure reduction compared with controls ($P = 0.097 > 0.05$). Meanwhile, in the S2 group, there was a significant difference in systolic blood pressure reduction compared with the control treatments ($P < 0.05$), but there was no significant difference in diastolic blood pressure reduction compared with controls ($P = 0.512 > 0.05$). Between the treatment of steeping red ginger rhizome (S1) and steeping binahong leaves (S2) there was no significant difference in systolic blood pressure reduction, which means that both red ginger and binahong seed had the same effect on systolic blood pressure ($p = 0.78 > 0.05$). Furthermore, research by measuring the urine volume parameter respondents needed to do.

Conclusions: Treatment steeping red ginger rhizome (*Zingiberofficinale R.*) and steeping binahong leaves (*Anrederacordifolia (Ten.) Steenis*) has a similar effect on systolic blood pressure reduction.

Keywords: *Anrederacordifolia (Ten.) Steenis, Binahong, Hypertension, Red Ginger Zingiber officinale R.*

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NP-21

Effect of ethanol extract and active fraction of *Hibiscus surattensis* L. leaves on blood glucose levels and histology of liver diabetic mice

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Abstract

Background: Diabetes cases are typically characterized hyperglycemia due to impairment in insulin action and/or insulin secretion in the target organs, especially the liver and muscles. The liver has a function in regulating glucose levels in the blood. If liver disorders occur, it can cause hyperglycemia or hypoglycemia. This study aims to determine effect on blood glucose level and the improvement of liver histopathologic in experimental diabetic mice after given ethanol extract and active fraction of *Hibiscus surattensis* L. leaves.

Methods: A total of thirty-six male mice were induced by a single STZ dose of 100 mg/kg BW intraperitoneally to cause diabetes mellitus. After exposure to diabetes, the mice were divided into 6 groups consisting of negative control (KN) treated by Na CMC 0.5%, positive control (KP) treated by Na CMC 0.5%, reference group treated by glibenclamide (Gli) 0.65 mg/kg BW and 3 treatment groups which were given ethanol extract (EE) and active fraction of *H. surattensis* L. leaves (ethyl acetate fraction/FEA and water fraction/WF) at a dose of 50 mg/kg BW for 4 weeks. Manja Roenigk Score was used to determine degree of liver damage.

Results: Ethanol extract and active fraction of *H. surattensis* L. leaves can reduce blood glucose levels with percentage hypoglycemic effect of EE 29.3%; FEA 35.5%; and WF 28.2%. The scores for hepatocyte damage were KN 21,3; KP 42,3; Gli 30,3; EE 29.7; FEA 24.7, and WF 32.0.

Conclusion: Based on the results of our study, ethanol extract and active fraction of *H. surattensis* L. leaves especially FEA can reduce blood glucose levels ($p < 0.05$) and improve liver histopathological features ($p < 0.05$) were significantly different from the positive control.

Keywords: *blood glucose, diabetes mellitus, histopathological, H. surattensis L., liver*

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NP-22

Proximate Composition and Antioxidant Activity of Leaf of *Moringa oleifera*

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Abstract

Background: The protective action of vegetables is associated with the presence of antioxidants, notably antioxidant vitamins, such as ascorbic acid. This research aimed to measure the proximate composition and antioxidant activities of leaves of *Moringa oleifera*, which is grown in Malino, Indonesia.

Method: Proximate parameters (moisture, ash, fat, protein, carbohydrate, and fibre) were evaluated using the Association of Official Analytical Chemists (AOAC) method. The ascorbic acid was measured by 2,6- dichlorophenol indophenol (DCPIP), while its antioxidant activity was evaluated by 2,2-diphenyl-1- picrylhydrazyl (DPPH) method.

Result: The results showed that the leaf of *M. oleifera* had a high content of carbohydrate and protein. In addition, from the study, the leaves were found to contain 8.5 mg/g ascorbic acid and showed more vigorous antioxidant activity ($IC_{50} < 50 \mu\text{g/mL}$).

Conclusion: The data obtained in the present study suggests that the leaves of *M. oleifera* can be contributed remarkably to the amount of nutrient intake in the human diet.

Keyword: Antioxidant, *Moringa oleifera*, proximate, nutrient

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NP-23

The Potency of Flavonoids (Quercetin, Rutin, And Myricetin) from *Elaeocarpus serratus* L. Leaves as Antiosteoporosis: A Literature Review

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Abstract

Background: *Elaeocarpus serratus* L. is a plant that has many benefits as traditional medicine (Ayurveda) since a long time for mental illness, epileptic, asthma, hypertension, arthritis, liver disease, skin diseases, leprosy, hysteria, coma, and vaginal discharge. The plant commonly known as Veralu or Rudraksha or Ganitri is a plant originating from Sri Lanka and distributed to the Indian Continent, China, and Southeast Asia. This plant grows in Indonesia especially in Java, Kalimantan, Papua, and Sumatera. *Elaeocarpus serratus* L. leaves contains flavonoid compounds especially quercetin, rutin, and myricetin.

Methods: The research method used was a literature review study which is included in the scoping review method by collecting articles from some databases about the antiosteoporosis activity of quercetin, rutin, and myricetin contained in *Elaeocarpus serratus* L. leaves.

Results: Based on several types of research, *Elaeocarpus serratus* L. leaves contained quercetin, rutin, and myricetin that have the ability to increase bone mass by stimulating osteoblast activity and inhibiting osteoclast activity.

Conclusion: *Elaeocarpus serratus* L. can be used as a source of raw materials in drug development for antiosteoporosis.

Keywords: *stress ulcer prophylaxis, overuse, stress ulcer, drug costs*

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NP-24

Effect of Gamborg media on the phytochemical profile of callus *Orthosiphon aristatus* purple and white-purple varieties: the first step in the production of natural drug products

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Abstract

Background: *Orthosiphon aristatus* is a plant with many pharmacological activities, and based on its flowers' morphology, *O.aristatus* is divided into three varieties: white, white-purple, and purple. The main active biological constituents that play a role in the pharmacological activity of *O. aristatus* are rosmarinic acid, sinensetin, and eupatorin. The three active compounds from the *O. aristatus* are still small. Therefore it needs efforts to produce these compounds, one of which is through plant tissue culture. In this study, the initial process of producing natural drug products is callus induction.

Methods: Callus induction used sterile leaf explants of two varieties of *O. aristatus* grown on Gamborg B5 basal medium with a growth regulator 2,4-dichlorophenoxyacetic acid 0.4 ppm. The callus formed was analyzed for its phytochemical profile using High-Performance Liquid Chromatography.

Results: Callus of two varieties *O.aristatus* began to grow on day 12, and observations on signal 340.60 nm of callus acetone extract of two varieties *O.aristatus* indicated the presence of rosmarinic acid compounds with levels of 1.23% w / w (purple variety) and 1.59% w / w (white-purple variety). Observations on the 254.24 nm signal showed a peak with a large area at the retention time of 7.08 (purple variety) and 7.09 (white-purple variety).

Conclusion: Callus formed from Gamborg B5 basal medium can be developed at the stage of cell suspension culture to produce natural drug products from *O. aristatus*, especially rosmarinic acid.

Keywords: *Plant tissue culture, Gamborg B5 basal medium, 2,4-dichlorophenoxyacetic acid purple varieties O. aristatus, white-purple varieties, rosmarinic acid*

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NP-25

Phenol-flavonoid contents and antioxidant activity of ethyl acetate fraction and aqueous fraction of Binjai (*Mangifera caesia* Jack. Ex. Wall) leaves methanol extract from South Kalimantan

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Abstract

Background: Phenols and flavonoids can scavenge free radicals resulting in an antioxidant activity. Previous research stated that the use of methanol as a solvent in the extraction of binjai leaves could produce higher antioxidant activity than the use of ethanol solvent. The aim of this study was to investigate the antioxidant activity, total phenolic and flavonoid contents in ethyl acetate fraction and aqueous fraction of Binjai leaves methanol extract.

Methods: Binjai leaves were extracted with methanol solvent by using the soxletation method and subsequently fractionated to ethyl acetate fraction (EAF) and aqueous fraction (AQF). The antioxidant activity of the fractions qualitatively and quantitatively was examined by DPPH (2,2-diphenyl-1-picrylhydrazyl) method. Total phenol (TPC) and total flavonoid contents (TFC) of the samples were determined spectrophotometrically using Folin-Ciocalteu and AlCl_3 reagents.

Results: The TPC of AQF (782 ± 0.983 mg GAE/g fraction) were found significantly higher as compared to EAF (430 ± 0.288 mg GAE/g fraction). The TFC of EAF (274.32 ± 0.082 mg QE/g fraction) mostly higher than AQF (118.8 ± 0.013 mg QE/g fraction). The antioxidant activity with TLC (Thin Layer Chromatography) in the both fractions there were two yellow spots on a purple background after sprayed by the DPPH. The EAF has shown the significant DPPH scavenging activity ($\text{IC}_{50}=5.356$ ppm) than AQF ($\text{IC}_{50}=23.175$ ppm) when compared with quercetin ($\text{IC}_{50}=3.367$ ppm).

Conclusion: The results of the study show that ethyl acetate fraction of Binjai leaves methanol extract produces more powerful antioxidant activity compared with its aqueous fraction.

Keywords: *Binjai leaves, phenol-flavonoid, antioxidant, ethyl acetate fraction, aqueous fraction.*

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NP-26

Antibacterial and Toxicity Properties of Prospective Compounds from *Meistera chinensis* (Zingiberaceae) Fruits Growing in South East Sulawesi

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Abstract

Background: *Meistera chinensis* (Zingiberaceae) mostly grows in Southeast Sulawesi. However, until now there have been no reports on the chemical and pharmaceutical aspects. For this reason, chemical and biological activities studies of ethanol extract and fraction of *M. chinensis* fruit have been carried out.

Methods: The method consisted of the fruit extraction with ethanol, fractionation using vacuum liquid chromatography (VLC). The chemical content of the extracts and fractions were analyzed by LC-MS/MS, and also phytochemical screening was carried out for the extract. The biological activities were evaluated against *Escherichia coli* and *Staphylococcus aureus*, then the toxicity was tested by BSLTmethode

Results: The results showed that the extract of *M. chinensis* fruit could be separated into 7 fractions. The phytochemical screening and LC-MS/MS data of the extract indicated that were presence of terpenoids (esculentagenic acid), steroids (hecogenin acetate), amino acid/alkaloid (valine), phenolic/flavonoid (C₂₈H₂₈O), alkaloids (C₁₈H₃₉NO₃, C₃₃H₆₇NO₃, C₃₄H₆₉NO₃), phenolic/flavonoid/terpenoid (C₂₅H₄₂O₅) and saponin (daturametelin I). In general, the antibacterial activity and toxicity of the samples were less active than the positive control. The ethanol extract was the most toxic with an LC₅₀ value of 5.37 ± 1.11 ppm. Fraction 5 was the most active against *S. aureus* with a MIC value of 32 ppm, then Fractions 5 and 6 were the most active towards *E. coli* with a MIC value of 128 ppm. The compounds of Fraction 5 are dihydrocostunolide, dl-umtatin, hecogenin acetate, C₂₅H₄₂O₅ and C₅₄H₇₈O₁₀. Fraction 6 contains hecogenin acetate, C₂₈H₂₈O, C₂₅H₄₂O₅, C₁₆H₁₇NO₂ and C₃₁H₅₇NO₉.

Conclusion: The unidentified compounds are prospective candidates of new active compounds.

Keywords: *Meistera chinensis*, fruits, LC-MS/MS, antibacterial and toxic

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NP-27

Optimization of Fermentation Condition on *Passiflora edulis* Sims. Fruit in De Men Rogosa Sharpe (MRS) Media and Its Activity Against *Escherichia coli* Extended Spectrum Betalactamase (ESBL) and Methicillin Resistant *Staphylococcus aureus* (MRSA)

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Abstract

Background: The purpose of this study was to determine the effect of fermentation techniques on the red passion fruit (*Passiflora edulis* Sims.) in deman rogosa sharpe broth (MRSB) media wrapped in banana leaves first and without banana leaves against *Escherichia coli* Extended Spectrum Betalactamase (*E. coli* ESBL) and Methicillin Resistant *Staphylococcus aureus* (MRSA).

Methods: This study was divided into three treatment groups. Group one was ripe red passion fruit pulp (5 grams) fermented in 45 mL MRSB medium for 24 hours. The second group was ripe red passion fruit pulp (5 grams) wrapped in banana leaves for three days then fermented with MRSB for 24 hours. The third group was ripe red passion fruit pulp (5 grams) wrapped in banana leaves for three days then fermented with MRSB for 48 hours. The filtrate was taken from each of the treatment groups and filtered using millipore (0,2 µm). As many as 50 µL were tested for their activity against *E. coli* ESBL and MRSA using Kirby-Bauer method.

Results: Based on the results of the study, it was found that the group two had the best antibacterial activity against *E. coli* ESBL and MRSA with the mean zone of inhibition against ESBL was 38.3 mm and 37.6 mm against MRSA bigger than group one 15,3 mm (*E. coli* ESBL) and 13,4 mm (MRSA), and group three 32,7 mm (*E. coli* ESBL) and 37,6 mm (MRSA).

Conclusion: The zone of inhibition produced by group one against ESBL and MRSA bacteria was 15.3 mm and 13.4 mm were categorized as moderate inhibition (16-20 mm). Whereas groups two and three had a zone of inhibition that was categorized as strong, more than 20 mm.

Keywords: *Passiflora edulis* Sims., antibacterial activity, *Escherichia coli* Extended Spectrum Betalactamase (*E. coli* ESBL), Methicillin Resistant *Staphylococcus aureus* (MRSA)

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NP-28

The hepatoprotective effect of sugarcane (*Saccharum officinarum* Linn.) leaves ethanolic extract on CCl₄-induced damages in rats

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Abstract

Background: Liver disease causes the death of about 2 million people each year worldwide. The liver plays an essential role in the process of metabolism and detoxification of xenobiotics. Xenobiotics or free radicals can damage liver cells. Sugarcane has antioxidant effects. This study was conducted to determine the hepatoprotection of sugarcane leaves in tested animals with liver damage triggered by carbon tetrachloride (CCl₄).

Methods: 24 Wistar strain rats were divided into three groups of experimental animals (dose 300, 400, 500 mg/kg), and three control groups (normal, positive, and negative). The ethanol extract of sugarcane leaves obtained from Panti, Jember, was made using the maceration method. The animals were treated for 14 days by giving the extract to the treatment group. One hour after treatment on the last day, the test animals were given CCl₄ intraperitoneal except for the normal group. On the 15th day, the blood of the test animal was taken to be tested for the biochemical value of the liver (AST, ALT, ALP, and bilirubin) and sacrificed for its liver to be made histological preparations.

Results: The results showed that the treatment with a dose of 500 mg/kg was able to decrease AST, ALT, ALP, and bilirubin parameters compared to the negative control. The extract also provided improvements in liver tissue histology compared to the negative control.

Conclusion: Sugarcane leaf ethanol extract had a potential hepatoprotective effect.

Keywords: *hepatoprotective, sugarcane leaves, CCl₄*

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NP-29

Effect of Quercetin on the Expression of SRBP-1c mRNA in High Fat Diet -Induced NAFLD in Mice

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Abstract

Background: The study aimed to determine the effect quercetin on the expression of primary regulator gene involved in lipogenesis and triglycerides synthesis in the liver, the Sterol regulatory binding protein - 1c (SREBP - 1c) mRNA in Non-Alcoholic Fatty Liver Disease (NAFLD) with high-fat diet (HFD) model.

Method: Fifty six, Bab/c mice were divided into seven groups: standard feed; high-fat diet (HFD); HFD and Quercetin 50 mg/kg for 28 days; HFD and Quercetin 100 mg/kg BW for 28 days; HFD and Quercetin 50 mg/kg for 14 days; HFD and Quercetin 100 mg/kg for 14 days; HFD and repaired fed for 14 days. Quercetin were administered intraperitoneally. At 24-hours after last treatment, the animals were sacrificed, the liver were taken for macroscopic, histopathological staining using hematoxylin-eosin and sample for RT-PCR analysis.

Results: HFD significantly increased the expression of SREBP-1c mRNA, meanwhile quercetin and repaired feed significantly reduced the expression of SREBP-1c mRNA in the liver. In addition, quercetin at a dose of 50 mg/kg and 100 mg/kg also improved the pathological profile of liver cells in high-fat diet NAFLD.

Conclusion: The present study suggests that quercetin has an inhibitory effect of SREBP-1c expression and improved liver pathology in NAFLD mice.

Keywords: *non-alcoholic fatty liver disease, NAFLD, quercetin, high-fat diet, SREBP – 1c*

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NP-30

Bioactive Compounds on Ethanol and Chloroform Extracts of *Piper sarmentosum* Roxb

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Abstract

Background: Piper (Piperaceae) is an aromatic plant which is usually used as a medicinal and ornamental plant. This purpose of this research to identify the bioactive compounds contained in the ethanol and chloroform extracts of *Piper sarmentosum* leaves.

Methods: The leaves were washed under running water, dried and made in powder form and extracted by maceration method. The extract was then identified for its bioactive compound content by Gas Chromatography Mass Spectrometry (GCMS).

Results: The results showed that the ethanol and chloroform extracts of *P. sarmentosum* contained 13 and 34 compounds respectively. The ethanol extract of *Piper sarmentosum* contains 3 main compounds, namely 1,3- Benzodioxole, 4-methoxy-6- (2-propenyl), 1,3-Benzodioxole, 5- (2-propenyl) -and alpha.-Cubebene, respectively as much as 50.65%; 25.19% and 5.15%. The chloroform extract of *P. sarmentosum* also contains three main compounds, namely myristicine, 1,3-Benzodioxole, 5- (2-propenyl) -and .alpha.-Cubebene, each as much as 62.94%; 13.92%; and 2.34%.

Conclusion: This compound has a prospective biological activity to be developed

Keywords: *ethanol, chloroform, Piper sarmentosum*

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NP-31

Endophytic fungi inhabiting *Physalis angulata* plant: diversity, antioxidant, and antimicrobial activity of their ethyl acetate extracts

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Abstract

Background: Endophytic fungi are an essential source of bioactive compounds due to their ability to produce the same secondary metabolites as their host plants. In this study we explored the antioxidant and antimicrobial activity of fourteen endophytic fungi isolated from medicinal plant *Physalis angulata*.

Methods: Fourteen endophytic fungi were isolated from the flower, stem, leaf and fruit husk of *Physalis angulata* (PA). The endophytic fungi were cultured and incubated in PDB medium at room temperature. After fourteen days, the cultures were extracted using ethyl acetate and dried using rotary evaporator. The antioxidant activity was evaluated against DPPH while antimicrobial activity was evaluated against *E. coli* and *S. aureus* using microdilution technique.

Results: Hyphomycetes fungus isolated from the flower of PA exhibited a moderate antioxidant activity with antioxidant index value of 0.59 (IC₅₀=52.43µg/ml). Six isolates have strong antimicrobial activity against *E. coli* and *S. aureus* with MIC value ranging from <8-64 µg/ml. These endophytic fungi are one hyphomycetes fungus isolated from flower, one *Fusarium sp.* isolated from stem, three *Colletotrichum sp.* isolated from leaf and fruit husk, as well as one *Phomopsis sp.* isolated from fruit husk of PA.

Conclusion: Endophytic fungi isolated from *Physalis angulata* are potential as novel sources of active metabolites especially for antimicrobial compounds.

Keywords: endophytic fungi, *Physalis angulata*, food borne pathogens, DPPH

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NP-32

The Effect of Incubation Time on Biotransformation of Gurjun Balsam Oil by *Aspergillus niger*

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Abstract

Background: Gurjun balsam oil is one of the essential oils from Indonesia which is isolated from the resin plant *Dipterocarpus turbinatus*. Gurjun balsam oil has a fragrant aroma and is used as a traditional medicine in the Indochina region. The main content of balsam gurjun oil is a copaene compound and several other sesquiterpenes ($C_{15}H_{24}$) class compounds. In this research, biotransformation of the compound content of gurjun balsam oil with *Aspergillus niger* was carried out.

Methods: The biotransformation process was carried out at room temperature with a speed of 130 rpm and a variation of the incubation time of 24, 48, 72, and 96 hours. The biotransformed products were analyzed by Gas Chromatography-Mass Spectrometer (GC-MS).

Results: The main products formed from the biotransformation of balsam gurjun oil were copaene (60.53%, 72 hours), beta-caryophyllene (24.14%, 96 hours), humulene (3.74, 48 hours), and alpha-cadinene (13.74, 48 hours). The optimum incubation time with the highest copaene product was 72 hours. The longer the incubation time for the copaene compound was obtained, the higher it was, but there was a decrease in the 96 hours incubation time.

Conclusion: Based on these results, it can be concluded that *Aspergillus niger* can increase the content of copaene compounds in balsam gurjun oil.

Keywords: *biotransformation, gurjun balsam oil, Aspergillus niger, and copaene*

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NP-33

Utilization of domestic waste shallot skins as a source of pharmacy active ingredients

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Abstract

Background: Medicinal plants are a source of many chemical compounds that are useful in the pharmaceutical field for novel drug development, including polyphenols, the flavonoid class. Polyphenol compounds in the flavonoid group are known to have several activities, such as may relieve CVD. The outer skin of the shallot which is disposed of as waste is known to have anti-inflammatory and antioxidant activity by the ABTS method. The activity of shallot extract as an antiplatelet which was tested *in vitro* has also been reported. Until now, there is no physicochemical properties and pharmacokinetic (ADMET) profile of the active ingredients of the shallot skins.

Methods: The extraction of shallot skins was conducted by ultrasonic irradiation using ethanol as solvent. The profiling of its active ingredient was carried out by GC-MSD, HPLC and spectrophotometry UV-vis. The physicochemical properties of active ingredient were analyzed by Chemdraw 17.00 program and the ADMET prediction was carried out *in silico* using pkCSM on line tool.

Results: The extract showed the presence of 13.43% natalensine-3,5-dinitrobenzoate; 36.90% bis[2-(2-fluorophenyl)-6-fluoroquinolin-4-yl]amine, 17.43% benzo[a]heptalene, 32.23% *N*-(trifluoroacetyl)methyl-*N*-deacetyl-colchicine. The extract has polyphenol of (11.14 ± 5.12)%, and quercetin as (4.607 ± 2.431)%. ADMET data shows that the compounds in the shallot skin are predicted to have good absorption so that they can be used in the oral and transdermal routes.

Conclusion: The ultrasonic shallot skin extract can be used as new source of the active ingredient for drug development and are predicted to have the potential to be developed as an oral or transdermal preparation.

Keywords: ADMET, polyphenol, ultrasonic extraction, pharmacy active ingredients

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NP-34

Artocarpus sericarpus* stem bark contains antimalarial substances against *Plasmodium falciparum

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Abstract

Background: The finding of alternative medicine for malarial treatment still become an important demand. Plant is one of the potential source of drugs among others natural sources. Chemotaxonomy approach leads us to determine the alternative antimalarial substances. *Artocarpus* species showed great potential as antimalarial source. This study aims to obtain active antimalarial fraction from *Artocarpus sericarpus* stem bark.

Methods: Stem bark of *A. sericarpus* was extracted using ultrasonic assisted extraction method using n-hexane, dichloromethane and methanol as a solvent. Fractionation of dichloromethane extract were conducted using open column chromatography using octadecyl silica as a stationary phase and gradient acetonitrile-water as a mobile phase. Antimalarial activity was determined by lactate dehydrogenase (LDH) assay against *P. falciparum* 3D7 strain.

Results: *Artocarpus sericarpus* n-hexane, dichloromethane and methanol extracts were showed antimalarial activity with IC₅₀ value of >4 µg/ml, 2,11 µg/ml and >4 µg/ml respectively. Fractionation of dichloromethane extract was obtained 13 fractions. Seven of the 13 fractions tested showed strong active antimalarial activity. Fraction-6 performed the highest inhibition with IC₅₀ value of 1.53 ± 0.04 µg/mL. Phytochemistry screening revealed that Fraction-6 contains flavonoid, polyphenol and terpenoids compound which possible to take a role on its antimalarial activity.

Conclusion: *A. sericarpus* contains antimalarial substances mainly in Fraction-6 which strong active inhibited the growth of *P. falciparum*. Flavonoids, polyphenol and terpenoids compound were identified in Fraction-6 which need to be further isolated to obtain and elucidate the active antimalarial compounds.

Keywords: *Artocarpus sericarpus*, active fraction, antimalarial, LDH assay

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NP-35

The effect of curcumin and quercetin on allodynia response in oxaliplatin-induced peripheral neuropathy pain

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Abstract

Background: Chemotherapy-induced Peripheral Neuropathy (CIPN) caused by the toxicity of chemotherapy agents mainly affects the peripheral nervous system. Platinum-class chemotherapy drugs, such as Oxaliplatin and Cisplatin, have higher prevalence in occurring this pain. Symptoms that arise as a result of these side effects are often called allodynia, such as dysesthesia and paraesthesia, of the hands, feet, and perioral area. Since antioxidant compounds like curcumin and quercetin may prevent this negative effect, we focused on the potential effect of curcumin and quercetin in reduce or cure the peripheral neuropathy. Through mechanical allodynia parameters with von Frey test, we can measure the withdrawal threshold of the mice.

Methods: Mice were injected intraperitoneally with oxaliplatin 3 mg/kg four times a week, then followed by giving curcumin at a dose of 30, 60, 120 mg/kg or quercetin at a dose of 50, 250, 500 mg/kg from day 7 to 14. Behavioural test with the von Frey filaments were carried out on day 0, 1, 3, 5, 7, 10, 14, 18, and 22.

Results: The results showed that oxaliplatin could induce mechanical allodynia by decreasing 50% withdrawal threshold of the mice. Curcumin increased the 50% withdrawal threshold with a dose of 30 mg/kg significantly at day 22, 60 mg/kg significantly from day 18, and 120 mg/kg significantly from day 14. Quercetin with a dose of 250 mg/kg and 500 mg/kg increased the 50% withdrawal threshold significantly from day 14 and 50 mg/kg significantly from day 18.

Conclusion: Injection of curcumin and quercetin intraperitoneally can significantly reduce the allodynia pain responses and increase the withdrawal threshold in animal which previously induced with oxaliplatin. However, further research on the mechanism of increasing the withdrawal threshold is needed.

Keywords: *CIPN, Oxaliplatin, Curcumin, Quercetin, von Frey*

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NP-36

Andrographolide, a New Hope in the Prevention and Treatment of Diabetic

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Abstract

Background: Diabetes mellitus (DM) is a metabolic disease characterized by a high level of blood glucose for a prolonged time. Patient with DM must take a drug for lowering the blood glucose levels for life. The synthetic antidiabetic drug is commonly used and significantly able to control blood glucose. However, many side effects will occur during the treatment. Recently, the use of plant-derived medicines is increasing interest in the prevention and treatment of a variety of disorders, including DM. Scientific evidence suggests that *Andrographis paniculata* and its derived components, especially andrographolide (AND) and its analogs/derivatives, have a promising activity. This review aims to sketch the activity of AND and its analogs/derivatives against the components of DM.

Method: Search data obtained from PubMed, PMC (PubMed Central), Scopus, and Google search engine.

Result: The results showed that AND and its analogs/derivatives exhibited a promising antidiabetic effect *in vitro* and exhibited synergistic effects on *in vivo*.

Conclusion: The finding suggests that AND and its analogs/derivatives are potentially developed as an alternative anti-DM agent. However, more studies should be conducted to evaluate their effectiveness and toxicity before applying on human.

Keyword: *Andrographolide, blood glucose, diabetes*

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NP-37

Acute and Subchronic Toxicity Assessment of 70% Ethanol Extract of Leaves of Gendarusa (*Justicia gendarussa* Burm. f.) in vivo

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Abstract

Background: In Indonesia, *Justicia gendarussa* Burm. f., have been used in traditional medicine for being anti-inflammatory, analgesic, antioxidant, hepatoprotective, anti-bactericidal, antifungal, and antifertility. Nowadays, a capsule containing 70% ethanol extract of leaves of *J. gendarussa* has been developed as an alternative for male antifertility. The aim of this study was to determine the acute and sub-chronic toxicity of 70% ethanol extract of leaves of *J. gendarussa* in vivo were performed in the present study in order to evaluate its safety.

Methods: In the acute toxicity study, a single dose of 2000 mg/kg BW was orally administered to mice (n= 10), which were monitored for 24 days. For sub-subchronic toxicity study, rats were randomly divided into four groups (n= 10). The control group received distilled water, while the experimental groups received a repeated dose of 40 (converting dose from human), 200 (5 times) and 1000 (25 times) mg/kg BW orally for 90 days. At the end of the experiment, blood samples were collected for hematology and biochemical evaluations. Gross pathology and histopathology of liver and kidneys were assessed.

Results: In the acute toxicity study, no mortality or/and non-observed adverse effect level (NOAEL) observed. In the sub-chronic toxicity study, the hematological analyses did not show significant differences between control and all treated groups in most of the parameters examined, except for the thrombocyte, basophile, neutrophil, lymphocyte, and hematocrit. The biochemical like ALT and creatinine were no change, giving 200 mg/kgBB increase the level of AST, while increasing level of BUN were observed in all treated groups. An abnormalities or histopathological changes were observed in the liver and kidney at 200 and 1000 mg/kg BW and safer at 40 mg/kgBB.

Conclusion: These results suggest that further research is needed to ensure its safety for clinical study.

Keywords: *Justicia gendarussa* Burm. f., 70% ethanolic extract, acute toxicity, subchronic toxicity

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NP-38

Topical Herbal Bigel for the Treatment of Psoriasis

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Abstract

Backgrounds- The objective of this study was to review and explore the currently herbal remedies used and the historically used herbal remedies in the treatment of psoriasis. Today, psoriasis vulgaris is recognized as the most prevalent autoimmune disease caused by inappropriate activation of the cellular immune system. Psoriasis has a significant impact not only the patient health but also on a patient's quality of life -sometimes profoundly altering their everyday life.

Methods- Bigels were prepared by combining hydrogel and oleogel at high shear rate, retaining the characteristic properties of both the components. The homogenous mixture formed a smooth gel by applying a definite shear speed and temperature. Aloe vera (*Aloe vera*), which is externally used for centuries in wound healing and was recently found to be a potential treatment for psoriasis. Bigels for psoriasis using aloe vera, were made of poloxamer 407 gel, polyethylene and liquid paraffin mixture.

Results- Herbal remedies for treatment of psoriasis disease to overcome the adverse effects, antagonistic effect and bioavailability of drug. Prepared bigels were found physically stable at room temperature (25°C) for three months and at least three months at 45 °C.

Conclusion- Psoriasis is undoubtedly distressing, affected individuals are typically otherwise healthy and thus well suited to thoughtful outpatient care. All formulations showed great inhibition of psoriasis vulgaris. Thus, bigels with aloe vera are a promising dosage form for psoriasis.

Keywords: *Bigel, Aloe Vera, Poloxamer 407, Psoriasis, Liquid Paraffin, Polyethylene*

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NP-39

In vitro antimalarial activity of *Garcinia parvifolia* Miq. stem extracts and fractions on *Plasmodium falciparum* lactate dehydrogenase (LDH) assay

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Abstract

Background. The rapid spread of antimalarial drug resistance becoming a problem in the treatment of malaria. The fact was indicated the important to find new antimalarial drugs. The genus *Garcinia* is well known to be a rich source of bioactive prenylated xanthenes and triterpenes, which was reported for their antimalarial activity. *Garcinia parvifolia* is one of the *Garcinia* genus which is potential to be explored for the search of new antimalarial drugs. This study was aimed to determine the antimalarial activities of *G. parvifolia* extracts and fractions.

Methods: *Garcinia parvifolia* Miq. stem collected from Balikpapan Botanical Garden in East Kalimantan, Indonesia, was extracted gradually with n-hexane, dichloromethane and methanol by ultrasonic assisted method. The most active extract was further separated using open column chromatography method. All extracts and fractions were tested against *Plasmodium falciparum* 3D7 using lactate dehydrogenase (LDH) assay and followed by IC₅₀ determination.

Result: The results showed that all extracts inhibit *P. falciparum* growth by LDH assay. The strong inhibition was showed by dichloromethane stem extract (BP12-S-D) with the IC₅₀ value of 6.61 µg/ml. Further fractionation of BP12-S-D was obtained 10 fractions. Fraction-1 (F1) performed the strongest inhibition of the parasite growth with IC₅₀ value of 6.00 µg/mL, compared to another fractions. This fraction was classified as having promising activity of antimalarial.

Conclusion: The fraction 1 of dichloromethane extract of *Garcinia parvifolia* Miq. stem was the strongest antimalarial activity, it might be a potential candidate for the new antimalarial drug.

Keywords: *Garcinia parvifolia*, antimalarial activity, lactate dehydrogenase (LDH)

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NP-40

Immunomodulatory Potentials of *Etilingera rubroloba* A.D. Poulsen Against CD4 Levels in Wistar Male Rats

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Abstract

Background: *Etilingera rubroloba* A.D. Poulsen is a plant that is endemic to Southeast Sulawesi and has a taxonomic affinity with *Etilingera elatior* (Jack) R. M. Smith. The fruit of the *E. elatior* (Jack) R. M. Smith plant has been reported to contain active compounds that act as immunomodulatory agents by increasing the phagocytic activity of macrophage cells. Based on the taxonomic proximity of plants, it is expected that *Etilingera rubroloba* A.D. Poulsen contains active compounds and can have the same effect as *E. elatior* (Jack)

R. M. Smith. This study aims to determine the immunomodulatory potential of the ethanol extract of the fruit of *E. rubroloba* A.D. Poulsen with parameters of CD4 levels.

Methods: Twenty-four male wistar rats were divided into 6 treatment groups, namely normal, negative (Na- CMC 0.5%), positive (commercial meniran extract 0.135 mg/kgbw), extract dose I (200), dose II (300), and the third dose (400) mg/kgbw. The treatment was given 3 mL/per bird orally every day for seven days. On the eighth day, all rats (except the normal group) were infected with 0.5 mL of *Staphylococcus aureus* intraperitoneal. Measurement of CD4 levels using the sandwich ELISA method and data were analyzed by one-way ANOVA and Tukey's post hoc.

Results: Showed that the average CD4 level of wistar rats in the normal group was 252.50 ng/mL, negative group 75.62 ng/mL, positive group 167.18 ng/mL, group dose I 204.53 ng/mL, dose II 227.49 ng/mL and dose III 175.62 ng/mL. Based on the results of Tukey's post hoc statistical test, it was shown that the three groups had doses of *E. rubroloba* A.D. Poulsen fruit extract has a significant difference with the negative and positive groups on CD4 levels ($P < 0.05$).

Conclusion: The ethanol extract of the fruit of *E. rubroloba* A.D. Poulsen has the potential as an immunomodulator against CD4 levels in wistar rats.

Keywords: *Etilingera rubroloba* A.D. Poulsen, immunomodulator, CD4, wistar rats, ELISA

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NP-41

Centella asiatica Extract as a Resolution of Inflammation In Severe Early Childhood Caries

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Abstract

Background: Early Childhood Caries is a progressive multifactorial disease caused by diet, oral hygiene and cariogenic bacteria which are found in many developing countries. In a chronic condition, this disease in children causes complications in the form of pain, abscess, loss of appetite, and even inability to eat, and becomes an economic burden for the family because of the high cost of care. The cariogenic bacteria *S. mutans* and *S. sobrinus* were found to be associated with the incidence of dental caries.

Objective: Analyzed the effect of *Centella asiatica* extract as a resolution of inflammation in S-ECC.

Methods: The present investigation was undertaken to analyze the expression of pro-inflammatory cytokines IL-1 β on salivary neutrophil surfaces using flow cytometer

Result: Extra *Centella asiatica* reduced pro-inflammatory cytokines IL-1 β on the neutrophil surface of salivary free caries at 0 $\mu\text{g/ml}$ ($3,12 \pm 0,75$), 12.5 $\mu\text{g/ml}$ ($2,90 \pm 0,57$), 25 $\mu\text{g/ml}$ ($1,98 \pm 0,59$), 50 $\mu\text{g/ml}$ ($1,92 \pm 0,66$), 100 $\mu\text{g/ml}$ ($1,50 \pm 0,50$), 200 $\mu\text{g/ml}$ ($1,43 \pm 0,51$), while in S-ECC at 0 $\mu\text{g/ml}$ ($10,6 \pm 0,83$), 12.5 $\mu\text{g/ml}$ ($9,33 \pm 1,03$), 25 $\mu\text{g/ml}$ ($9,27 \pm 0,96$), 50 $\mu\text{g/ml}$ ($6,67 \pm 1,06$) and 100 $\mu\text{g/ml}$ ($5,25 \pm 0,94$), 50 $\mu\text{g/ml}$ ($5,17 \pm 0,80$).

Conclusion: *Centella asiatica* extract is effective as a resolution of inflammation in S-ECC

Keywords: *Severe childhood caries, Neutrophil cells, IL-1 β pro-inflammatory cytokines early*

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NP-42

Antioxidant and Antiviral Potency of Benalu Batu (*Begonia medicinalis*)

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Abstract

Background: This study aims to determine the antioxidant and antiviral potency n-hexane, ethyl acetate and water extracts of Benalu Batu (*Begonia medicinalis*) and to identify their chemical constituents.

Methods: Antioxidant and antiviral (HIV-1) activity test were performed by using DPPH method and cytopathic effect assay. Meanwhile, GC-MS was used to identify the chemical compounds

Results: Antioxidant assay showed that all extract possessed potent antioxidant activity with the IC₅₀ range from 2.62 to 7.93 µg/mL. Antiviral activity on MT-4 cells infected by HIV virus showed that the n-hexane extract of *Begonia medicinalis* showed the most potency with the IC₅₀ of 9.84 x 10⁻⁵ µg/mL. The cytotoxic activity was 15 µg/mL, affording the high selectivity index of 1.5 x 10⁵. GC-MS analysis of n-hexane extract found the major compound that is 2-Pentyl 6-(4-Pentylphenyl) 2,6-Naphthalenedicarboxylate with the area percentage of 43.87%.

Conclusion: This study supports the application of Benalu Batu as herbal medicine for antioxidant and antiviral

Keywords: *Begonia medicinalis*, antiviral, antioxidant, HIV-1, GC-MS

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NP-43

Phytochemical Screening, TLC and Antioxidant Activity of Aerial Part of *Phyllanthus niruri*

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Abstract

Background: Natural products has been in use by various civilization in different parts of the world for centuries. *Phyllanthus niruri* is medicinal plant and recommended for the treatment of various disease. *Phyllanthus niruri* is rich source of flavonoids and polyphenol component. The present study was planned to evaluate the phytochemical, TLC and antioxidant activity of aerial part of *Phyllanthus niruri*.

Methods: The hydroalcoholic extract of the aerial part of *Phyllanthus niruri* were prepared by maceration method. The phytochemical screening and TLC study was performed for the extract. The antioxidant activity of extract was investigated on different models such as total phenolic acid and flavonoid contents.

Results: The preliminary phytochemical screening of the hydroalcoholic extract demonstrated the presence of flavonoids, polyphenol, tannin, protein and glycosides. The TLC study confirmed the presence of flavonoids such quercetin and gallic acid in extracts. The total phenolic acid and flavonoid contents in extracts were found to be 2.20 mg of gallic equivalents per mg and 1.531 mg of quercetin equivalents per mg, respectively.

Conclusion: The outcomes of present study confirmed the existence of phenolics supported medicinal uses of the species and active biomolecules could be isolated for pharmaceutical applications.

Keywords: *Phyllanthus niruri*, *Phytochemical*, *TLC*, *Antioxidant activity*

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NP-44

The Study of Imunebooster Effect of Ethanol Extract of *Mychorriza arbuscule* Induced Ginger Rhizomes (*Zingiber officinale* Rosc.)

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Abstract

Background: Ginger has been used traditionally in Indonesia to treat swollen skin, nausea, vomiting and as a stimulant [1]. The literature review shows that ginger extract has several pharmacological activities such as antiemetic, antimicrobial, anti-inflammation, analgesic, antioxidant, anticarcinogenic, and immunomodulatory. The major compounds in the extract are 6-gingerol, 6-shogaol, paradol, methyl gingerol, gingerdiol, dehidrogingerdion, and gingerdion. Gingerol and shogaol are known as anti-inflammatory activity by suppression the biosynthesis of inflammatory mediators. A previous study shows that *Mychorriza arbuscula* fungi induced ginger rhizomes has highergingerol and shogaol contents. The bioactive components of ginger are very potential to be developed as an imunebooster agent. The research aim was to determine the effect of the ethanol extract of *Mychorriza arbuscula* fungi induced ginger rhizomes (EMig) as imunebooster by increase the activity and capacity of macrophage cell phagocytosis, the total and the precentage of leukocytes of intraperitoneally *Staphylococcus aureus* (iPSA) induced male albino mice.

Methods: The concentration of EMig at 30,100 and 300 mg/kg of body weigh were used as independent variables with Na CMC 0.5 % as a control, while phagocytosis activity of macrophage, the total and percentage of leucocytes cell of iPSA induced male mice were taken as the response variables. Data were analyzed by using analysis of variance (ANOVA) with SPSS 14 software programme.

Results: The results showed that EMig could increase the phagocytosis activity of macrophage cells significantly ($P<0.05$). The phagocytosis activity with given by EMig at concentration 30, 100 and 300 mg/kgbw were 59 %,73%, 82% compared to control was 51.4%. The total of leucocytes were 4850, 6240 and 8400 cells/ μ L of blood, respectively compared to control was 4370 cells/ μ L of blood, with increase the number of lymphocytes.

Conclusion: The concentration of EMig at 300 mg/kgbw give optimum result which has a phagocytosis activity of macrophage cells, the total and percentage of leucocytes.

Keywords: ginger extract, *Mychorriza arbuscule* fungi, imunebooster, phagocytosis activity, leucocyte cells

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NP-45

Anti-Inflammatory Effect of *Ixora coccinea* Linn on Stem Cells of Human Exfoliated Teeth (SHED) cells

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Abstract

Background: *Ixora coccinea*, family Rubiaceae is a cultivated species and can be found growing in the tropical and subtropical climates of the world. The plant is essential for several medicinal purposes including inflammatory, wound healing, diarrhea and cancer.

Methods: In the current study, the anti-inflammatory effect of *Ixora coccinea* extract has been investigated by the inflammatory cytokine profile and using hen's egg test chorioallantoic membrane (HET-CAM) assay

Results: The result showed that the highest viability of cells was 78.3 % at the concentration of 1.56 mg/ml. The inflammatory cytokine including IL-1 β , IL-6, IL-8 and TGF- β were expressed in both untreated SHED and treated SHED, but only TNF- α and GM-CSF were not expressed in the both of samples. The crude methanol extract shows a significant-good anti-inflammatory effect (80.0% inhibition at 50 μ g/disc) on the HET-CAM assay as compared with the anti-inflammatory drug indomethacin (85.0% inhibition). The results demonstrated that *Ixora coccinea* root displayed remarkable anti-inflammatory effects that support the folkloric uses of this plant for the treatment of inflammation.

Conclusion: In conclusion, *Ixora coccinea* root extracts possesses anti-inflammatory effects through immunomodulatory mechanisms.

Keywords: *Ixora coccinea* Linn, anti-inflammatory, HET-CAM assay, SHED

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NP-46

Review: Study of Standardized Herbal Drug Preparations of *Justicia gendarussa* Burm.f. leaf as Male Contraceptive

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Abstract

Background: Currently a capsule containing 70% ethanol extract of *J. gendarussa* leaves has been developed as an alternative to male fertility. Drug quality control must be carried out from the start, starting from the selection of raw drugs to the production process. Extract quality control is necessary for quality control, safety and efficacy. Quality control parameters consist of specific and non-specific parameters. This paper aims to study the standardization of *J. gendarussa* extract and granulation by making the physical properties of *J. gendarussa* granules good with fillers of lactose and corn starch. **Method:** Optimization is made into 3 formulas. The difference between each formula lies in the ratio of corn starch and lactose. Formula 1 with a ratio of 3: 7 for corn starch and lactose, Formula 2 with a 1: 1 ratio for lactose and corn starch, Formula 3 with a ratio of 7: 3 for corn starch and lactose. The physical evaluation is to select and select the best grain such as flowability, fine grade, angle of rest, moisture content and compressibility.

Result and conclusion: From the evaluation, F2 was selected as the best formula. Metabolite Profiles can be applied as a reliable quality control (QC) tool for herbal medicinal preparations, especially if the lever specifying quality markers has not been determined. Several *J. gendarussa* herbal preparations, namely dry acidified crude drugs, ethanol extracts, laboratory-made granule preparations, and industrial-scale granules, can be clearly distinguished using a combination of liquid chromatography, ultra-high-resolution-resolution, quadrupole mass spectrometry. time-of-flight-mass and multivariate analysis.

Keyword: *Justicia gendarussa* Burm.f., extract *J. gendarussa*, quality control

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NP-47

***Averrhoa bilimbi*: A Potential Phytomedicine For the Treatment of Tuberculosis**

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Abstract

Background: The emergence of multidrug-resistant *Mycobacterium tuberculosis* strains resulted in rigorous research to develop new anti-tuberculosis drugs. One of the potential sources of arsenal therapeutic agents is to prospect them from plants. *Averrhoa bilimbi* (commonly known as bilimbi) is traditionally used to treat cold, cough, inflammation and bacterial infection. This study aimed to investigate the anti-tuberculosis and cytotoxicity of standardised extracts and fractions of *A. bilimbi*.

Methods: The extracts and fractions of *A. bilimbi* were prepared by maceration (80 % methanol) and liquid-liquid partition (hexane, chloroform, ethyl acetate and aqueous) method, respectively. The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of the extracts and fractions were screened using tetrazolium microplate assay (TEMA). The *in vitro* toxicity was determined against human embryonic kidney cell (HEK 293) using MTT assay.

Results: The *in-vitro* screening showed the most active fraction is from hexane fractionation with MIC and MBC of the 100 µg/ml and 400 µg/ml, respectively. The hexane fraction is also not toxic at the bactericidal concentration of 400 µg/ml with half-maximal inhibitory concentration (IC₅₀) of 145.2 µg/ml against HEK 293 cell line.

Conclusion: Hence, the hexane fraction of *A. bilimbi* is worthy of investigating its anti-TB activity further to reveal how best these plants can be used in the treatment of this dreaded disease.

Keywords: *anti-tuberculosis, Averrhoa bilimbi, natural product*

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NP-48

The effect of *Camellia sinensis* (Green tea) with its active compound EGCG on neuronal cell necroptosis in *Rattus norvegicus* Middle Cerebral Artery Occlusion (MCAO) model

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Abstract

Background: Stroke is a sudden neurological deficit caused by focal brain injury to the central nervous system by vascular causes. Stroke is in the 2nd position as a non-communicable disease that causes death. Oxidative stress plays important role in the pathology of neuronal cell death after ischemic stroke

Methods: In vivo-study perform on male *Rattus norvegicus* MCAO model divided into 3 groups, control groups, EGCG 30 mg/kgBW/day, and green tea extract “Meditea” 30 mg/kgBW/day for 7 days treatment. MCAO model made by modification method use Bulldog clamp. After 7 days of treatment, all *Rattus norvegicus* were sacrificed. After that, we examined use H.E stain to look at necroptosis morphology in each group.

Results: we found that there are significant difference between control group and two group EGCG and Green Tea Extract ($p < 0,05$). There is no significant different in EGCG group compared to Green tea extract group ($p > 0,05$). There is significant correlation between neuron cell necroptosis morphology and both EGCG and Green tea extract ($p < 0,05$). Correlation is negative which mean, an EGCG/ Green tea extract will decrease neuron cell necroptosis morphology.

Conclusion: *Camellia sinensis* (green tea) with its active compound EGCG decrease neuronal Necroptosis morphology in MCAO models

Keywords: *Green tea, Camellia synensis, EGCG, Necroptosis, Neuron*

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NP-49

Total flavonoid and polyphenol content of *Tinospora crispa* cultivated at highland region

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Abstract

Background: *Tinospora crispa* (T crispa) is herbaceous plant which commonly grows wild in tropical regions of South East Asian countries such as Indonesia, Malaysia, and Thailand. In Indonesia this plant is well known to be used as traditional medicine to treat gout, diabetes, hypertension, rheumatic, fever, and appetite stimulant. Researches worldwide indicated that T crispa poses several pharmacological properties. One of those is the antioxidant activity, acting as free radical scavenger. The objective of this study was to determine the antioxidative properties of T. crispa by analyzing the total flavonoid and polyphenol content.

Methods: T. crispa was cultivated at 850 AMSL field in Materia Medica Batu. The plant was harvested by cutting 5 cm of old stem and dried in 50° C for 7 days. Powder was then made by using milling machine. The amount of 300 g powder was subsequently macerated to get T. crispa extract. Total flavonoid and polyphenol contents were determined by using spectrophotometry method.

Result: From 300 g T crispa powder using maceration method gave liquid yield with 56 g weight and 18.66% rendement. Total flavonoid and polyphenol content was 0.04% ± [3.68%] (w/w) and 0.60% ± [0.8%] (w/w) respectively.

Conclusion: Despite low in concentration, flavonoid and polyphenol content were successfully determined from T crispa. In the future free radical scavenging assay need to be conducted to understand better about the antioxidant activity of T crispa.

Keywords: *Tinospora crispa* (L) mier, Brotowali, Flavonoid, Polyphenol

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NP-50

The effect of ganitri (*Elaeocarpus serratus* L.) from Baung Forest on bone formation cell models

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Abstract

Background: Osteoporosis is a disease described by a skeletal degradation of bone tissue dominating to increased risk of fracture. In order to find out the bone formation agents from Baung Forest plants, this research analyzed the effects of 96% ethanol extract of several plants from Baung Forest on antioxidant activity and the effect of osteoblast differentiation related to bone formation on the most potent extract.

Methods: The antioxidant effect and osteoblast differentiation of 96% ethanol extracts were evaluated by measuring DPPH scavenging and alkaline phosphatase in *p*-nitrophenyl phosphate effects by Elisa reader method, respectively.

Results: The 96% ethanol extract of *Elaeocarpus serratus* L. from Baung Forest had the strongest DPPH radical scavenging as anti-oxidant (82.17%) and stimulated osteoblast differentiation (116%). Then, this extract had been fractionated based on polarity to become hexane, ethyl acetate, butanol, and aqueous fractions. All the fractions stimulated their ALP activity to 138.11±9.72%, 108±5.05%, 148.56±8.47, and 144.58±1.04, respectively.

Conclusion: The 96% ethanol extract and hexane, butanol and aqueous fractions of *Elaeocarpus serratus* L. can successfully reduce expression of antioxidant markers on osteoblasts and maintain osteoblast functions by stimulated alkaline phosphatase.

Keywords: *alkaline phosphatase, bone formation, DPPH scavenging, 96% ethanol extract, Elaeocarpus serratus*

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NP-51

Quality Control Standardization of *Carthamus Tinctorius* L. Flowers Ethanol Extract

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Abstract

Background: Safflower (*Carthamus tinctorius* L.) is one of the plants which has it used by the community for the treatment of hypertension, measles, cholesterol, stomach ache and malaria.

Objective: Aims this investigation to establish some specific parameters as well as non-parameters specific of standardized of *C. tinctorius* flower ethanol extract. Standardized extracts of medicinal plants need to be done to maintain the stability of raw materials of the drug so that in accordance with the quality requirements that have been set.

Methods: Specific parameters such as the organoleptic properties of the extract. In contrast, the non-specific parametric includes drying shrinkage, microbiological contamination levels, ash levels, the solubility of extracts in water and ethanol.

Results: The results of testing of specific parameters showed the viscous organoleptic extract, deep red, distinctive odor and have a sense of sepat with the womb 0.12% water soluble compound and 0.22% ethanol soluble compound, chemicals group contained flavanoid, saponin, triterpenoid, tannin, kuinon, steroid and Rf value 0.79. Results of non-specific parametric testing 0.96% dry shrinkage, 1.02% weight, 0.91% moisture content, ash content 0.23%, ash content insoluble in 0.2237% acid, microbial contamination $< 1.0 \times 10^{-1}$ colony / mL, and contents of mold / yeast $< 1.0 \times 10^{-1}$ colony/mL.

Conclusion: The ethanol extract of *Carthamus tinctorius* L. flowers fulfills specific and non-specific standardized parameters.

Keywords: *Carthamus tinctorius* L., malarial, standardized, specific parameters, non-specific parameters.

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NP-52

Review: Quality Control Study of Crude Drug of *Justicia gendarussa* Burm. f. Leaf as Male Contraceptive

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Abstract

Background: *Justicia gendarussa* Burm. f. leaf contains gendarusin A compound, which potentially as an anti-fertility agent. Preclinical research (*in vivo*, *in vitro*, and toxicity) and clinical trials have been carried out then it is proven that gandarusa leaf are safe to be used as male contraceptive. Quality control of medicine must be carried out from the beginning, when selecting crude drug until production process. Quality control of the crude drug is needed to maintain the quality, safety, and efficacy of leaf simplicia *J. gendarussa* Burm.

f. Quality control parameters consist of specific and non-specific parameters. This article aims to review crude drug of *J. gendarussa* Burm. f. standardization that has been done in Madiun, Mojokerto, and Ponorogo.

Methods: macroscopic and microscopic assay, powder identification, determination of ash content, compound levels, and contaminants (heavy metals, pesticides, and microbes).

Results: the quality of crude drug is different from each region. Crude drug from Mojokerto and Ponorogo was better than crude drug from Madiun. This is influenced by environmental difference factors on how plants grow.

Conclusion: Therefore, it is necessary to control the crude drug quality when doing research with the same plant but from different areas.

Keywords: *Justicia gendarussa* Burm. f., quality control, crude drug

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NP-53

Review: Study of Utilization Prospect of Gendarusa (*Justicia gendarussa* Burm. f.) as anti HIV/AIDS Agent

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Abstract

Background: Acquired Immune Deficiency Syndrome (AIDS) is a disease due to infection by HIV-1 (Human Immunodeficiency Virus-1). HIV destroys the CD4 T lymphocytes (CD4 cells) of the immune system, leaving the body vulnerable to life-threatening infections. Currently, management of HIV infection uses antiretroviral therapy (ART) with a complex dose regimen and has a mechanism of action to suppress the viral replication. The complexity of the therapeutic regimen and the long duration of therapy can increase the risk of side effects and drug resistance problems. Long term use of HAART has been reported to produce morphologic and metabolic abnormality syndrome, especially hypertriglyceridemia which can be increased the risk of cardiovascular (CVS) and cerebrovascular diseases in patients receiving ART. The drug treatment of co-existing medical disease (s) and opportunistic infections can also complicate the ART. The development of medicinal plants can be a solution to find new drugs that can be act as anti-HIV-1.

Methods: This review conduct through searching publication about gendarussa with anti HIV/AIDS activity in database literature PubMed, SCOPUS, Scencedirect, Google Scholar, Cochrane *Central Register of Controlled Trials* (CENTRAL) and Repository University of Airlangga with Gendarusa (Gendarussa OR *Justicia gendarussa*) and HIV/AIDS (“HIV” OR “AIDS” OR “HIV/AIDS”) keywords search article. Anti HIV/AIDS activity measured by inhibition *syncytia* and cytolysis, Inhibition virus enzyme activity, viral load and binding energy.

Results: Gendarusa (*Justicia gendarussa* Burm. f.) has been scientifically proven by *in vitro*, *in silico* and *in vivo* assay to possess anti-HIV-1 activity.

Conclusion: This study highlighted several studies that showed the effectiveness and safety of gendarusa as anti-HIV-1 in order to be developed in the future.

Keywords: *Justicia gendarussa* Burm. f., medicinal plant, anti retroviral, anti HIV

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NP-54

Antimicrobial activity of *Centella asiatica* and *Gigantochloa apus*: a nutraceutical study

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Abstract

Background: Recently, antibiotic treatment created multidrugs resistant among several pathogens. Therefore, alternative of antibiotics is needed to overcome the problem. *Centella asiatica* (pegagan) and *Gigantochloa apus* (bung apus) are two common functional food used to treat tuberculosis, diarrhea and some other symptoms. This study has been carried out to compare antimicrobial activity of those two functional food against *M. tuberculosis* H37Rv strain, *E.coli*, *S. aureus*, *B. subtilis*, and *S.typhi*.

Methods: The ethanolic extracts of *C. asiatica* herba and *G. apus* shoot, were obtained by speed extractor, using pressure and temperature extraction, then phytochemical contents of each extract were screened. Antimycobacterial activity of extracts were determined using Lowenstein Jensen (LJ) medium, whereas antibacterial activity using Kirby-Bauer methods on Mueller Hinton agar (MHA).

Results: The phytochemical analysis showed that *G.apus* extracts contained alkaloids and tannins, whereas *C.asiatica* contained flavonoids, alkaloids, saponins, and tannins. Furthermore, our study resulted that *G. apus* inhibited the growth of *M.tuberculosis* H37Rv strain and *S.typhi*. On the other hands, *C.asiatica* showed antimicrobial activity against *M.tuberculosis* H37Rv strain, *E.coli*, *S.aureus* and *S.typhi*.

Conclusion: In conclusin, both funtional foods can inhibit the growth of bacterial tested, therefore potentially can be used as alternative treatment, or complementary, to overcome the pathogens invasion.

Keywords: *antimicrobial, C.asiatica, G.apus, drug, functional food, nutraceutical*

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NP-55

Screening of Anti-HIV Activities in Ethanol Extract, Chloroform, Ethyl Acetate, and Buthanol Fractions from *Ficus fistulosa*

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Abstract

Background: Human Immunodeficiency Virus (HIV) infection is considered as a major immunosuppressive disease linked to malignancies and other opportunistic infections. Recently, the high prevalence of HIV drug- resistant strains required a high demand for novel antiviral drugs development, especially in herbal medicine approaches. The objective of this study is to evaluate the herbal therapeutic antiviral activity of *Ficus fistulosa* against HIV in crude extracts form as well as its fractions using chloroform, ethyl acetate and butanol solvents.

Method: *Ficus fistulosa* was extracted using ethanol as a solvent and further gradually fractionated in chloroform, ethyl acetate, and butanol solvents. The targeted persistently infected virus (MT4/HIV) cell lines were co-cultured with the herbal extracts at different time points and the syncytia and cytotoxicity assays were performed to evaluate the potential antiviral activity of *Ficus fistulosa*.

Result: Two of the four tested extract/fraction showed antiviral activity against HIV. The crude extract showed effective inhibition as well as low level of toxicity (IC₅₀= 8.50 ug/ml, CC₅₀ = 42.35 ug/ml and SI=5.05). Meanwhile, Chloroform fraction also effectively inhibited the MT4/HIV cells proliferation while keeping the toxicity to a minimal level (IC₅₀= 10.68 ug/ml, CC₅₀ = 29.73 ug/ml and SI =2.78).

Conclusion: Chloroform fractions of *Ficus fistulosa* showed antiviral activity against MT4/HIV cells. Though our study showed potential inhibition by chloroform fractions but further studies are required to investigate the active compound responsible for HIV inhibition in *Ficus fistulosa* extracts and fractions.

Keywords: *Ficus fistulosa*, anti-HIV, medicinal plant, in vitro

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NP-56

Antioxidant activities of different types of vinegars

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Abstract

Background: Vinegar is an example of widely consumed traditional sustenance presenting with medicinal values. Traditionally it has been postulated to be effective in the treatment of various diseases such as diabetes, fever, microbial infections and gastrointestinal problems. We have previously demonstrated that nipa palm vinegar (NPV) has shown anti-hyperglycemic along with significant anti-oxidative activities. Oxidative stress has been implied as a major contributor in the pathophysiology of diabetes and its vascular complications. Hence, our aim was to explore the antioxidant activities of selected types of vinegars.

Methods: Seven types of vinegars were examined as follows: apple cider (ACV), balsamic (BV), brown rice (BRV), distilled white (DWV), malt (MV), NPV, and red wine (RWV) vinegars. These were assessed for antioxidant capacity by the following assays: (1) 1,1-diphenyl-2-dipicrylhydrazyl radical scavenging activity (DPPH) and (2) Ferric Reducing Antioxidant Power (FRAP) assays.

Results: The results for DPPH free radical scavenging activity were considered based on the IC₅₀ values. Balsamic vinegar was the strongest scavenger, while DWV showed the lowest scavenging activity. In summary, the different types of vinegar showed a trend of free radical scavenging activity as follows: BV > NPV > RV > MV > ACV > BRV > DWV. The FRAP test also showed significant ferric reducing power with, similarly, BV showing the highest activity and DWV showing the lowest activity. All the tested samples exhibited concentration-dependent ferric reducing power at a concentration range of between 1.563 to 100 mg/ml. However, there was a slight dissimilarity in the trend between the different types of vinegars as follows: BV > MV > RV > NPV > ACV > BRV > DWV.

Conclusion: This study has shown that all seven types of vinegars possess antioxidant activities which may play a beneficial role in the management of diabetes.

Keywords: *vinegar, antioxidant, traditional medicine*

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NP-57

Antioxidant activities of extracts from the leaves of *Cassia moschata* Kunth

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Abstract

Background: Oxidative stress has been reported to play important role in the pathogenesis of several diseases, including cancer, cardiovascular, and Alzheimer's diseases. In our previous study, we have investigated the potency of *Cassia moschata* as an acetylcholinesterase inhibitor in relation to Alzheimer's disease. The aims of the current study are to investigate the antioxidant property of the ethanolic and aqueous extracts of *C. moschata* as well as to determine the total phenolic (TPC) and flavonoid (TFC) contents.

Methods: Two different methods were used to evaluate the antioxidant activity by 2,2-diphenyl-1-picrylhydrazyl (DPPH) and 2,2'-azinobis-(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) assays. The total flavonoid content of the extracts were determined by colorimetric method using quercetin as standard, while total phenolic contents were analyzed by the Folin-Ciocalteu method by employing gallic acid as reference.

Results: The ethanolic and aqueous extracts of *Cassia moschata* demonstrated antioxidant activity in both DPPH and ABTS assays. There were statistically significant differences in the EC₅₀ values of the ethanolic and aqueous extracts in both DPPH and ABTS assays. The aqueous extract exhibited a lower EC₅₀ value compared to that of ethanolic extract. The EC₅₀ value for aqueous extract was 36.46 µg/mL in the DPPH assay, and 10.61 µg/mL in the ABTS method compared to EC₅₀ 38.74 µg/mL and 17.17 µg/mL for ethanolic extract, respectively. The TPC and TFC measurements revealed that the aqueous extract has higher amount of phenolic than the ethanolic extract, meanwhile the ethanolic extract contains higher flavonoid than the aqueous extract.

Conclusion: These data suggest that the aqueous extract of *Cassia moschata* leaves has a higher ability to scavenge free radical compared to the ethanolic extract, which also contains higher content of phenolic compounds.

Keywords: *Cassia moschata*, antioxidant, radical-scavenging, phenolic, flavonoid

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NP-58

Antipyretic Potential of Maja in Fever Induced Male Mice by DPT (*Difteri, Pertusis, Tetanus*) Vaccine

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Abstract

Background: Fever is a condition when the body experiences an increase above normal body temperature. Maja fruit (*Crescentia cujete* L.) contains chemical compounds including alkaloids, flavonoids, saponins, and terpenoids which are suspected as potential antipyretics.

Methods: This study aims to determine the antipyretic activity and effects of variations in the ethanol extract of maja fruit. There are 25 healthy male white mice of the DDY strain with the weight 20-30 g were divided into 5 treatments and 5 replications. These treatments divided into 3 treatment groups with a dose of 125 mg/kg BW, 250 mg/kg BW, 500 mg/kg BW, positive control of Ibuprofen 400 mg and negative control CMC- Na 1%. The induction of fever uses DPT vaccine volume of 0.1 cc (I.P). Observations were made by measuring the rectal temperature of mice using a digital thermometer before DPT vaccine injection or normal temperature, at a 0-minutes (after DPT vaccine injection), 60, 120, 180, and 240 minutes after administering the test material.

Results: The results showed that giving 3 groups treatment of maja's ethanol extract was able to reduce the body temperature of mice.

Conclusion: The dose of 500 mg/kg weight gave the best decrease in body temperature of mice but did not differ significantly from ibuprofen.

Keywords: *Antipyretics, Crescentia cujete (L.), fever, potential.*

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NP-59

Assessment of Anti-methicillin Resistant *Staphylococcus aureus* (MRSA) and Anti-Methicillin Susceptible *Staphylococcus aureus* (MSSA) Properties of Malaysian Medicinal Plants

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Abstract

Background: *Staphylococcus aureus* is a leading cause of human bacterial infections, including MSSA and MRSA infections. The MRSA strains are resistant to first-line antibiotics used for the treatment of infections caused by susceptible strains. Hence, this led to the administration of second and third-line medicines in combination which is often costly and more toxic. Plants are well-known sources of new drugs because of their lower cost, higher accessibility and fewer adverse effects relative to synthetic agents. This study aimed to investigate the antibacterial activities of 21 Malaysian plant extracts, and investigate the interaction between the active extract and synthetic antibiotics against MSSA and MRSA strains. The bactericidal activities of the active plant extract were also studied against MSSA and MRSA.

Methods: Minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of the plant extracts (maceration in 80% methanol) were determined using the microdilution method. The interaction between the active extract and the antibiotics (vancomycin and ciprofloxacin) was accessed with a checkerboard design. The bactericidal property of the active extract was measured using the time-killing methodology.

Results: Out of 21 extracts tested, *Areca catechu* seed extract showed significant antibacterial activity (MIC and MBC of 400µg/mL) against MSSA and MRSA strains. The extract in combination with vancomycin and ciprofloxacin showed an additive interaction against MSSA and MRSA strains. The extract also showed significant bactericidal activity when compared to the nontreated MSSA and MRSA cultures.

Conclusion: *Areca catechu* has the potential to be used for the treatment of MSSA and MRSA infections. However, further studies are crucial.

Keywords: *Staphylococcus aureus*, Malaysian medicinal plants, plant-drug interaction, *Areca catechu*

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NP-60

Antiviral activities of *Acacia mangium* leave against hepatitis C virus

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Abstract

Background: Hepatitis C virus (HCV) infection is a worldwide public health burden. There is no vaccine yet to prevent the infection. The current treatment has been improved with direct acting antiviral agents (DAAs) which dramatically increased the sustain virology responses (SVRs), however the resistance and high cost issue presented the need of the new agents for HCV. *Acacia mangium* is a plant from *Fabaceae* family that was reported to contain with quercetin and procyanidin. Those compounds were evaluated to inhibit HCV with IC₅₀ value of 1.5 µg/ml and 2.06 µM, respectively. This study aimed to examine anti-HCV activities of *A. mangium* extracts.

Method: Leave of *A. mangium* was extracted with 96% ethanol and successively extraction with *n*-hexane, dichloromethane, methanol. Anti-HCV activity was tested by inoculated the extract and fraction onto Huh7it cells-HCV infected at a concentration of 0.01; 0.1; 1; 10; 50; 100 µg/ml.

Result: The result was showed that IC₅₀ value of ethanol extract 96%, *n*-hexane, dichloromethane and methanol extract were 4.45 ± 0.06 µg/ml; 2.94 ± 0.09 µg/ml; 0.22 ± 0.03 µg/ml; and 2.68 ± 0.09 µg/ml, respectively without any cytotoxic effect. Mode of action (MOA) of ethanol extract was evaluated in the concentration of 30 µg/ml and obtained that the extract possessed stronger inhibition in the post entry step (56.25%) than the entry step (36.81%).

Conclusion: These results indicated that the extracts of *A. mangium* leaves possess strong inhibition against HCV. Extract of *A. mangium* may potential candidate to develop as anti-hepatitis C virus agents.

Keyword: *Anti-hepatitis C virus, Acacia mangium, medicinal plan, extract*

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NP-61

Antibacterial activity of extract and fractions of *Mimosa pudica* leaves against MRSA and ESBL producing *Escherichia coli*

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Abstract

Background: Antibacterial resistance is one of the biggest public health challenges. Misuse and overuse of antibiotics have contributed to antibiotic resistance. Previous studies show that methanolic extract of *Mimosa pudica* has antibacterial activity against *Escherichia coli* and *Staphylococcus aureus*. The present study was carried out to investigate the antibacterial activity of extract and fractions of *Mimosa pudica* leaves against Methicillin Resistant *Staphylococcus aureus* (MRSA) and Extended Spectrum β -Lactamase (ESBL) producing *Escherichia coli* (ESBL).

Methods: *Mimosa pudica* leaves were macerated in 80% ethanol, and followed by liquid-liquid fractionation using n-hexane, ethyl acetate and n-butanol. Disk-diffusion agar method was performed to analyze antibacterial activity with five serial concentrations (3;6;9;12;15 mg) and the zone of inhibition was measured. TLC bioautography assay also conducted to analyze antibacterial activity of secondary metabolites.

Results: Extract and fractions of *Mimosa pudica* exhibited antibacterial activity against MRSA, and only ethyl acetate fraction showed antibacterial activity against both MRSA and ESBL with zone of inhibition 19.33 mm and 10 mm at concentration 15 mg. TLC bioautography result showed flavonoid, alkaloid and saponin from ethyl acetate fraction had antibacterial activity against MRSA and ESBL.

Conclusion: Ethyl acetate fraction of *Mimosa pudica* leaves contained flavonoid, alkaloid and saponin that were potential against MRSA and ESBL producing *E. coli*

Keywords: *Mimosa pudica*, MRSA, ESBL, TLC bioautography, *Escherichia coli*

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NP-62

Antimicrobial activity of ethanol extract of Sempur leaves (*Dillenia suffruticosa* (Griff.) Martelli) against *Staphylococcus aureus*, *Escherichia coli*, and *Candida albicans*

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Abstract

Background: Sempur leaf (*Dillenia suffruticosa*) is known as a traditional medicine among the residents of Bangka-Belitung Island. Local community empirically uses boiled water of sempur leaves as an anti-diarrhoea. However, antimicrobial activity from the ethanol extract of sempur leaves has not been reported yet. The research aims to test the antimicrobial activity of ethanol extract of sempur leaves against several microorganisms, namely *Staphylococcus aureus* as a representative of Gram-positive bacteria, *Escherichia coli* as a representative of Gram-negative bacteria, and *Candida albicans* as a representative of fungi. This research is a preliminary study. So, it can be as a reference in studying the potential of sempur leaves as an antimicrobial agent.

Methods: The extraction was done by maceration method with 70% ethanol as a solvent. The extract was screened for phytochemical constituents including alkaloid, flavonoid, tannin, saponin, steroid and triterpenoid. The antimicrobial test was done by disc diffusion method using Nutrient Agar for bacteria, and Sabouraud Dextrose Agar (SDA) for fungi.

Results: Phytochemical screening showed that the ethanol extract of sempur leaves contains alkaloid, flavonoid, tannin, and saponin. The antimicrobial tests showed that the extract can inhibit the growth of *S. aureus* at a concentration of 10%, 20%, and 40% respectively about 8.35 ± 0.05 , 9.34 ± 0.32 , and 10.52 ± 0.22 . The extract was found cannot inhibit the growth of *E. coli* and *C. albicans*.

Conclusion: The ethanol extract of sempur leaves can inhibit the growth of *S. aureus*, while for *E. coli* and *C. albicans* showed no activity.

Keywords: antimicrobial, *Dillenia suffruticosa*, ethanol, maceration, sempur leaves

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NP-63

Elicitor Treatments Increase In Vitro Antiplasmodial Activity of Sonchus arvensis L. Callus

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Abstract

Background: Malaria disease is still global problem in the world. Finding new drugs is needed to decrease malaria mortality value. This situation push researcher to find new drug from synthetic or natural product. One of Indonesian medicinal plants is *Sonchus arvensis* L. which is used in the treatment of several diseases.

Objective: To investigate the *in-vitro* antiplasmodial activity of Callus *Sonchus arvensis* L. by elicitor treatments.

Methods: Leaf explant of *Sonchus arvensis* L. were cultured on MS (Murashige & Skoog) solid medium which supplemented with dichlorophenoxyacetic acid (2,4-D) 1 mg/L, benzyl amino purine (BAP) 0.5 mg/L (control) and elicitors. The elicitors are Glutamin 0,25 g (G₁); Glutamin 0,5 g (G₂); Ammonium Nitrate 0,5 g (NN₁); Ammonium Nitrate 1g (NN₂); Kalium Nitrate 0,5 g (KN₁); Kalium Nitrate 1 g (KN₂); Kalium Posphat 0,1 g (KP₁); Kalium Posphat 0,2 g (KP₂); and Control (K). Callus of 4 weeks old was extracted by methanol. The crude extract of the callus was investigated for *in vitro* antiplasmodial activity against D37 strain of *Plasmodium falciparum*.

Results: Additional of elisitors influenced the growth of the callus. Fresh and dry weight of callus were varied. In vitro antiplasmodial activity of the callus were investigated. The IC₅₀ of the callus were 1.254 µ/ mL (control), 0.414µ/ mL (0.5 g KNO₄), 1.179µ/ mL (1 g KNO₄), 0.017 µ/ mL (0.1 g KH₂PO₄), 0.293 µ/ mL (0.2g KH₂PO₄), 0,0699 µ/ mL (0,25 g Glutamin), and 1-10 µ/ mL (0,5 g Glutamin; 0,5 g Amonium Nitrat; 1g Amonium Nitrat).

Conclusion: This present study highlighted the very promising antiplasmodial activity of *Sonchus arvensis* L. callus. The treatments of various elicitor increase *in vitro* antiplasmodial activity of the *Sonchus arvensis* L. callus.

Keywords: *antimalaria, callus, elisitors, Plasmodium falciparum, Sonchus arvensis L.*

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NP-64

Effect of Pulutan (*Urena lobata*) Leaf Extract on Blood Glucose Level and Body Growth of Zebra Fish (*Danio rerio*) Exposed by Malathion

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Abstract

Introduction: Malathion is one of organophosphate pesticides suspected as endocrine disruptor. Pulutan (*Urena lobata*) is medicinal plant used to treat some diseases empirically and pre-clinical study has already proven its efficacy as anti-diabetic and anti-hiperlipidemic. The study aims to evaluate the effect of *Urena lobata* (*U. lobata*) leaf extract on blood glucose level and growth in the juvenile and adult of zebra fish (*Danio rerio*) exposed by malathion chronically.

Method: The object study using juvenile and adult of zebra fish (*Danio rerio*) which divided into five group (n=5). The leaf of *U. lobata* was extracted by decoction methods therefore it was diluted into 125 mg/L, 250 mg/L and 500 mg/L. The animal test was exposed by herbs for 40 days concomitant with malathion 2,5-5 mg/L. Blood glucose level were measured using a commercially available glucometer, meanwhile body weight and length using balance scale and rule respectively. All data are expressed as the mean \pm SD and analyzed with one way anova and then continued with LSD (p<0.05).

Result: The administration of *U. lobata* leaf extract at dose of 125 mg/L, 250 mg/L and 500 mg/L increased the body weight about 40%, 70% and 90% (p<0.05) respectively on juvenile, meanwhile on adult of zebra fish were not increased (p>0.05). Whereas the body length increased both of on juvenile and adult of zebra fish up to 20 % (p<0.05). The blood glucose level was decreased by 40%, 60% and 40% (p<0.05) respectively on juvenile that were given *U. lobata* at dose of 125 mg/L, 250 mg/L and 500 mg/L, meanwhile on adult of zebra fish were reduced 60%, 50% and 50% respectively (p<0.05).

Conclusion: *U. lobata* leaf extract is able to inhibit the increase of blood glucose level and the decrease of growth both of on juvenile and adult of zebra fish (*Danio rerio*).

Keywords: blood glucose, *Danio rerio*, growth, malathion, *Urena lobata*

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NP-65

***In vivo* antiplasmodial potentials of the leaf extract of *piliostigma reticulatum* (dc.) hochst (fabaceae)**

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Background: Reports of antimalaria resistance has prompted the search for novel antimalaria agents that are efficacious with cost effective pharmacotherapies. The plant *Piliostigma reticulatum* (PR) has been used traditionally in the treatment of malaria, fever and other ailments in northern Nigeria, however there is no data on the antiplasmodial activity of the plant. Therefore, we investigated the *in vivo* antiplasmodial activity of the methanol leaf of *Piliostigma reticulatum* (MPR) in mice infected with chloroquine-sensitive *Plasmodium berghei*.

Method: The powdered leaves of the plant was extracted with 70% methanol using cold maceration. The antiplasmodial activity was determined using curative, suppressive and prophylactic models. Three doses of MPR (250, 500 and 1000 mg/kg) were orally administered to a group of six Swiss albino mice. The positive control group of the mice were given doses of chloroquine and artesunate (for curative and suppressive tests), and pyrimethamine (for prophylactic test). The negative control group of mice received distilled water. A digital camera software was used for the parasitaemia count. The antiplasmodial activity of the extract was then compared to the negative control. The survival time was monitored, the LD₅₀ and phytochemicals of the extract were also evaluated.

Results: The extracts produced significant results ($P < 0.001$) at the tested doses. Curative test of MPR: At 250 (83.65%), at 500 (76.53%), and at 1000 (68.31%). Furthermore, the extract also prolonged the survival of infected mice (5.2 days) beyond the group treated with the negative control. Suppressive test of MPR: 1000 (78.37%), 500 (81.33%), and 250 (73.79%). Prophylactic test of MPR: 1000 (84.77%), 500 (58.70%), and 250 (68.50 %). The LD₅₀ was above 5000 mg/kg. The presence of glycosides, saponins, tannins, flavonoids, triterpenes and alkaloids were also confirmed.

Conclusion: The methanol leaf extract of PR demonstrated antiplasmodial activity and may justify the traditional use of the plant in treatment of malaria in northern Nigeria.

Keywords: *Malaria, in vivo antiplasmodial study, Plasmodium berghei, Nigeria*

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NP-66

Adenosine receptor inhibitor activity (sub-type A₁ and A_{2A}) of *Fraxinus griffithii* Clarke stembark

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Abstract

Background: Research on the role of adenosine receptors in the treatment of Parkinson's disease showed that their therapeutic effects might be associated with neuroprotective action. Indonesian plant *Fraxinus griffithii* Clarke (Tikken) is known to have Central Nervous System active substance. The aim of this study was to investigate the adenosine receptor inhibitor activity of the extracts, fractions and isolates of *Fraxinus griffithii* Clarke stem-bark.

Methods: To obtain the material test in the form of extracts, fractions and isolate, the separation process was carried out by column chromatography. There were eleven fractions obtained by fractionation process (FG 1 - FG 11). Sub-fractionation process was performed on the dominant fraction. The sediment of sub-fractions FG 6B was detected as a single compound. Characterization of this sediment performed with LC-MS and NMR spectrophotometer. The results indicate that FG 6B sediment is syringin. All compounds obtained from fractionation process of *F.griffithii* were being tested in-vitro on adenosine receptor subtypes A₁ and A_{2A} by radioligand binding assay. The activity is correlated with the affinity (indicated by the value K_i). The lower the K_i value, the higher the affinity.

Result: In this experiment, the ethanol extract and syringin did not show any affinity to the receptor. The fraction that showed affinity was fraction FG 3, FG 7E, FG 7F, FG 7H, FG 9, FG 10, FG 10B, FG 10C and FG 11 (with A₁ adenosine receptor) and fraction FG 10 and FG 10C (with A_{2A} adenosine receptor). The fraction FG 10B (K_i = 0.46 ± 0.01) showing the highest affinity to A₁ adenosine receptor and the fraction FG 10C (K_i = 12.10 ± 1.40) to A_{2A} adenosine receptor.

Conclusion: The results of the study show that the fractions of *Fraxinus griffithii* Clarke contains active substance which have adenosine receptor inhibitor effect.

Keywords: *Fraxinus griffithii* Clarke, adenosine receptor, radioligand binding assay, Parkinson

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NP-67

In Vitro Acetylcholinesterase Inhibitory Activities of Subfractions and Isolate from Ethyl Acetate Fraction of Marine Sponge *Agelas nakamurai*

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Abstract

Background: Marine sponges have been the source of fascinating metabolites with potent bioactivities. In the previous study we have investigated the potency of extract and fraction of *Agelas nakamurai* collected from Tabuhan Island Banyuwangi as acetylcholinesterase inhibitor (AChEi), and discovered that the methanol extract as well as ethyl acetate fraction gave strong inhibition against AChE enzyme. The aim of the current study was to carry out bioassay-guided isolation of the active ethyl acetate fraction.

Methods: The fractionation was carried out by vacuum liquid chromatography (VLC). The isolation was performed on high performance liquid chromatography (HPLC). The acetylcholinesterase inhibitory assay was conducted by using the modified Ellman's method. The chemistry of the active isolates was studied by UV and ¹H NMR methods.

Results: The VLC fractionation of the ethyl acetate fraction yielded 11 subfractions, which were then screened for AChEi assay. The results showed that at 100 µg/mL, subfractions 2 to 6 inhibited AChE ≥ 50%. The IC₅₀ values of subfractions 2 to 6 were then determined, which showed that subfraction 3 gave the strongest activity with IC₅₀ value of 3.78 µg/mL. Subfraction 3 was further subjected to HPLC. The HPLC profile showed that there is a major compound appearing at approximately 34 min. The UV profile of the isolated compound showed strong peaks at 210 and 271 nm, which suggested the present of a pyrrole -2-carbonyl ring. This data was further supported by ¹H NMR analysis. The AChEi assay of the isolated compound showed 72,87% inhibition at 100 µg/mL, and IC₅₀ value of 8.12 µg/mL.

Conclusion: The diterpene alkaloid from *Agelas nakamurai* sponge can be a good candidate of acetylcholinesterase inhibitor.

Keywords: *Agelas nakamurai*, diterpene alkaloid, acetylcholinesterase inhibitor, marine sponge

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NP-68

Attenuation of Hyperplasia in Lung Parenchymal and Colonic Epithelial Cells in DMBA-Induced Cancer Model by Administering *Andrographis paniculata* Nees Extract

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Abstract

Backgrounds: Cancer is a disorder caused by the uncontrolled growth of abnormal cells. The disease was the second leading cause of death in the world. Its high mortality rate is due to the absence of symptoms in the early stage, so it can be detected and treated after reaching an advanced stage. For this reason, inhibition of abnormal cell growth at the hyperplasia stage becomes critical in reducing the rate of cancer development and the incidence of death. Several secondary metabolites of medicinal plants such as andrographolide are expected to be able to prevent the development of hyperplasia leading to uncontrolled cell proliferation. Therefore, this study was designed to evaluate the potential of andrographolide in *A. paniculata* ethanolic extract to inhibit the increase in proliferation and induction of abnormal cell death.

Methods: The hyperplasia stage was induced by oral administration of 20 mg/Kg BW DMBA to SD rats twice a week for 5 weeks. There were 5 groups in this study include negative control, positive control, and treatment groups of DMBA induction followed by administration of 10, 30 or 100 mg/Kg BW andrographolide in ethanolic extract once per day for 6 consecutive weeks. On the last day, mice were sacrificed, lung and colon tissue were collected. Histological examination by HE staining and immunohistochemistry using p53, telomerase, and caspase-3 antibodies were aimed at observing hyperplasia state in these tissues.

Results: DMBA induction to SD rats able to produce hyperplasia in lung parenchymal and colon epithelial tissue as indicated by the increasing number of proliferated cells. This can be indicated by the number of brown-colored nuclei with sharper intensity. As well telomerase appears to be overexpressed strongly, while p53 and caspase 3 show low intensity. The administration of *A. paniculata* extract for 6 weeks showed a decrease in the number of cells that actively proliferate, a decrease in telomerase activity, and an increase in caspase 3 levels which indicate cellular death activity.

Conclusions: *A. paniculata* ethanolic extract can inhibit the development of cancer at the hyperplasia stage by reducing telomerase activity and increasing apoptosis, marked by an increase of caspase 3 expressions.

Keywords: *Andrographis paniculata*, DMBA-induced Cancer, Telomerase, Caspase-3, hyperplasia

NP-69

Neuraminidase activity of 96% ethanol extract of *Vitex pinnata* L. leaves

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Abstract

Background: According to World Health Organization, since 2003 until September 2020, it is reported that 861 influenza A (H5N1) cases in humans which caused 455 of deaths worldwide (Case Fatality Rate of 53%). Due to the resistance of current antiviral drugs used to treat influenza A (H5N1) infection, new antiviral is strongly needed. Many studies have reported antiviral activity of some bioactive compound from plants of Verbenaceae family against several viruses. This raised a concern to utilized plants from Verbenaceae family as a source of new antiviral agents. *Vitex pinnata* L is one of medicinal plants from Verbenaceae family that rich in flavonoids compounds which have been reported to have several biologicalactivities.

Methods: In this study, the inhibitory activity of 96% ethanol extract of *Vitex pinnata* L leaves on neuraminidase enzyme was done using MUNANA assay as well as the antioxidant activity using DPPH (2,2- diphenil-1- picrylhydrazyl) method. Neuraminidase is one of the crucial enzyme in the envelope of H5N1 viral surface.

Results: The result showed that IC₅₀ 96% ethanol extract of *Vitex pinnata* L leaves on neuraminidase enzyme was 99.33 µg/mL and the IC₅₀ of antioxidant activity was 59.86 µg/mL.

Conclusions: In conclusion, 96% ethanol extract of *Vitex pinnata* L is potential to be developed as antiviral agents.

Keywords: *Vitex pinnata* L, antiviral agent, neuraminidase, antioxidant

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NP-70

Isolation And The β -Galactosidase Enzyme Activity Test Of Lactic Acid Bacteria From Cabbage Fermentation (*Brassica Oleracea L.*)

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Abstract

Background: Cabbage is one of the local vegetables that can be used as a source of Lactic Acid Bacteria (LAB) producing the β -galactosidase enzyme. β -galactosidase enzymes is useful for overcoming digestive problems in people with lactose intolerance. The aim of this study was to obtain several lactic acid bacteria isolates from cabbage fermentation (*Brassica oleracea L.*) which had the ability to produced the enzyme β - galactosidase.

Methods: The enzyme activity test was carried out by looked the ability of the β -Galactosidase enzyme to decompose lactose into monosaccharide. This study began with isolation of LAB from cabbage fermentation, then characterization of LAB macroscopically and microscopically. The selected LAB isolates was measured their enzyme activity used the visible spectrophotometer with *o*-nitrophenyl- β -D-galactopyranoside (ONPG) substrate followed by the protein content test with Bradford's method.

Results: The isolation results got six isolates of LAB which were selected based on macroscopic and microscopic characterization and had the activity of β -galactosidase enzyme. K32 isolate had the highest activity of 0.2567 U / ml with a protein content of 0.7827 mg / ml.

Conclusion: from the result can be concluded that lactic acid bacteria in cabbage can produced β -galactosidase enzyme.

Keywords: *Cabbage Fermentation (Brassica oleracea. L), Lactic Acid Bacteria, β galactosidase enzyme, ONPG*

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NP-71

Chemical and DNA Profiles Study of *Justicia gendarussa* Burm.f. Leaves

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Abstract

Background: *Justicia gendarussa* Burm.f. or JG has been known and used as traditional male anti fertility drug in Papua, Indonesia. The C-glycosyl flavone group with an apigenin structure base might be caused antifertility effect and JG plants have the potential to be developed into phyto-pharmaceutical products as non-hormonal male contraceptives. Then in order to produce phyto-pharmaceutical preparations from JG leaves, a study of the effect of leaf drying process and the growing location on simplicia was carried out as one of the influences of external factors on metabolite profiles. Then a DNA profile analysis was carried out to determine the possibility of other variants of the *Justicia gendarussa* Burm.f. which can affect metabolite profiles.

Methods: Metabolites were predicted using the UHPLC-UHR-QTOF-MS instrument then analysis of metabolite profiles using multivariate analysis. Analysis of DNA banding patterns on DNA profiles using the PCR-RAPD method with 8 types of primers.

Results: 43 metabolites were predicted from all samples using UHPLC-UHR-QTOF-MS. Then the multivariate analysis method (MVA) showed that there were differences in the metabolite profile of *Justicia gendarussa* Burm.f. leaves based on the drying process and growing location. There are 7 metabolites that have caused different metabolite profiles based on different drying processes. The results of DNA profile analysis using the PCR-RAPD method with 8 types of primers have also shown that there are differences in DNA banding patterns on *Justicia gendarussa* Burm.f. which have been taken from different growing locations.

Conclusion: Analysis of metabolite profiles of *Justicia gendarussa* Burm.f. leaves has been done to determine the differences that have been affected by the drying process and the growing location. Then a DNA profile analysis was carried out to determine the possibility of other variants of the *Justicia gendarussa* Burm.f. which can affect metabolite profiles.

Keyword: *metabolite profiles, DNA profiles, metabolites identification, Justicia gendarussa Burm.f.*

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PC-01

***m*-Methoxycinnamic Acid as Prospective Antiangiogenic Drug Candidate**

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Abstract

Background: Currently drug targeted therapy is increasingly important because of its specificity against cancer cells, but not toxic to non-targeted cells. Thus, the effective therapy on certain the target protein-causing disease can be achieved, while minimizing the side effects on the normal tissue. Information about specific protein targets is very important and at the same time provides information about the mechanism of action of a drug. Our previous research reported that, the derivatives of cinnamic acid such as ferulic acid showed anti- angiogenesis effects. This research evaluates the potency and safety of *m*-methoxy cinnamic acid (MMA), which has some similar moiety with those cinnamate derivatives, as antiangiogenic drug candidate.

Methods: Synthesis of MMA compound was prepared through Knoevenagel reaction using the microwave irradiation. Anti-angiogenesis assay of MMA was carried out using CAM method. Immunohistochemistry assay was conducted by staining with COX-2 and VEGF antibody. The ulcerogenic test was conducted in mice. Molecular docking of the MMA was performed by MVD program (PDB 1CX 2 and 4ASD). Its pharmacokinetic profile was determined by pkCSM online program.

Results: The synthesis method successfully yielded 85%. At dosage of 30-90 mg, MMA prevents development of branching of blood vessels, and reduced COX-2 expression at that doses, while VEGF expression from 60- 90 mg dose. MDS at PDB 1CX2 = -87.86 while at PDB 4ASD = -89.35. It has good ADME profile, with LD₅₀ 2254 mg/kg BW. The ulcer score was 1.2

Conclusion: MMA compound is a promising anti-angiogenic therapeutic agent, especially in an early stage of angiogenesis process.

Keywords: *m*-methoxycinnamic acid, Chorio Allantoic Membrane, antiangiogenesis, COX-2, VEGF

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PC-02

Nanocrystalline cellulose synthesis from biomass using acid hydrolysis for drug delivery

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Abstract

Background: Nanocrystalline cellulose (NCC) is popular for drug delivery due to large surface area. Valorising underutilised cellulose sources like biomass for NCC preparation is attractive. Acid hydrolysis is commonly used to synthesis NCC but usually a high acid concentration is needed to generate a small size NCC. This work aims to prepare NCC from kapok fibers (*Ceiba pentandra*) using a low acid content and evaluate the influence of reaction parameters on the NCC synthesis.

Methods: NCC was isolated from kapok pulp through acid hydrolysis using 40% sulfuric acid in different reaction conditions including temperature (50 and 80°C), duration (40 and 100 min), acid to pulp ratio (30 and 80 mL/g) and sonication time (10 and 30 min). The NCC were characterised for yield, size and zeta potential.

Results: NCC yield increases with reaction time (40 min: 24-35%; 100 min: 27-50%) and temperature (50: 24-36%; 80°C: 34-50%). A low acid pulp ratio shows a higher yield (24-50%). All samples showed nanoscale particle size <500 nm with different amounts and the highest NCC amount 50% was obtained at 80°C, 100 min, 1:30 mL/g and 30 min for reaction temperature, duration of reaction, acid to pulp ratio and sonication time respectively. All samples showed zeta potential value of -29 – -40 mV, indicating a good dispersion stability. A higher reaction time showed a lower zeta potential value (-40 mV). Sonication time was found no obvious effect on the outcomes measured.

Conclusion: NCC was successfully prepared from kapok fibers. Reaction time and temperature were found to substantially affect the characteristics of NCC produced. This preliminary work highlighted the important factors to be considered for further optimisation to be used in drug delivery.

Keywords: nanocrystalline cellulose, acid hydrolysis, biorenewable materials, biomass.

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PC-03

Thymoquinone and Its Derivatives Against Breast Cancer with HER2 Positive: In Silico Studies of ADMET, Docking and QSAR

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Abstract

Background: The high prevalence of HER2-positive breast cancer has become a significant concern in the health sector. HER2-positive breast cancer is caused by overexpression of the HER2 receptor. The problem is more complex with the side effects of breast cancer drugs currently used, like resistance at the beginning or during therapy with trastuzumab and lapatinib are known to cause hepatotoxicity. This study aimed to determine the pharmacokinetics profile (ADMET), docking, and quantitative structure-activity relationship (QSAR) of thymoquinone derivatives as candidates for breast cancer drug with HER2-positive.

Methods: The prediction of ADMET was using the SMILES online translator and pkCSM online. Molecular docking was used to determine thymoquinone derivatives activity using Molegro Virtual Docker version 5.5 and QSAR analysis using the IBM SPSS 21 version.

Results: The 12 thymoquinone derivatives showed good physicochemical and absorption properties and not hepatotoxic, so they are suitable for oral drugs. The molecular docking of 12 thymoquinone derivatives against 3PP0 proteins showed better activity than thymoquinone. One of the thymoquinone derivatives, 4 [N'-(4-hydroxy-2,5-dimethylphenyl)-4-(trifluoromethyl) benzohydrazide] showed the largest negative RS value, meaning that is predicted to have the highest anticancer activity. Based on the QSAR analysis, the essential parameter in determining 12 thymoquinone derivatives activity was the electronic parameter.

Conclusion: Based on in silico test, thymoquinone derivative 4 [N'-(4-hydroxy-2,5-) dimethyl phenyl)-4-(trifluoromethyl)benzohydrazide] had the potential to be further developed as a HER2-positive breast cancer drug.

Keywords: *thymoquinone, HER2 positive, pkCSM, Molegro Virtual Docker, QSAR.*

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PC-04

In vitro and in silico analysis on the bone formation activity of *n*-hexane fraction of semanggi (*Marsilea crenata* Presl.)

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Abstract

Background: Estrogen deficiency in postmenopausal women causes various health problems, including osteoporosis. Osteoporosis is a result of imbalances between new bone formation and old bone resorption. Phytoestrogens can be used as an alternative to increase bone formation and overcome estrogen deficiency. Semanggi (*Marsilea crenata* Presl.) is a plant that contain phytoestrogens. The aim of this research was to investigate the bone formation activity of *n*-hexane fraction of *semanggi* leaves against hFOB 1.19 cells by observing the expression of osteocalcin, and predicting the phytoestrogen contents of the fraction through metabolite profiling and in silico studies.

Methods: hFOB 1.19 cells were cultured in 24 well microplates, and added the *n*-hexane fraction of *semanggi* leaves at doses of 62.5, 125, and 250 ppm. Genistein 1 μ M was used as a positive control. Analysis of osteocalcin expression was conducted using immunocytochemistry with CLSM. Metabolite profiling was conducted using UPLC-QToF-MS/MS. In silico study of the compounds found in metabolite profiling was conducted using molecular docking with PyRx 0.8 software and 1ERE protein.

Results: *n*-hexane fraction of *semanggi* leaves increased osteocalcin expression with the optimum dose of 62.5 ppm and a value of 457.35 AU at $p < 0.05$. Metabolite profiling of *n*-hexane fraction found 26 identified compounds, 14 unknown compounds. 10 of the identified compounds showed ER- β agonists activity.

Conclusions: The *n*-hexane fraction of *semanggi* leaves increased bone formation activity. Compounds of the fraction that showed ER- β agonists activity might be phytoestrogens.

Keywords: hFOB 1.19 cell, semanggi, *Marsilea crenata* Presl., osteocalcin, phytoestrogens.

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PC-05

Molecular Docking Studies of *Nigella sativa* and *Curcuma xanthorrhiza* Secondary Metabolites Against Histamine N-Methyltransferase with their ADMET Prediction

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Abstract

Background: Histamine N-methyltransferase (HNMT) is an enzyme that plays a crucial role in the inactivation of histamine in central nervous system, kidneys, and bronchi. Inhibition of HNMT is known to have a potential role in treating attention-deficit hyperactivity disorder, memory deficiency, and neurodegenerative diseases. Therefore, to find potential compounds that could be developed as HNMT inhibitors, this study conducted an in silico study of the secondary metabolites of *Nigella sativa* and *Curcuma xanthorrhiza*.

Methods: In this study we conducted a molecular docking study of 36 secondary metabolites of *Nigella sativa* and 26 secondary metabolites of *Curcuma xanthorrhiza* using an in silico approach targeting HNMT protein (PDB ID: 2AOT) using AutoDockVina software. The prediction of absorption, distribution, metabolism, excretion and toxicity characteristics was done using the pkCSM Online Tool.

Results: This study obtained one metabolite from *Nigella sativa* (longifolene) and nine metabolites from *Curcuma xanthorrhiza* {demethoxycurcumin, curcumin, (+)-beta-atlantone, humulene epoxide, (-)-beta-curcumene, (E)-caryophyllene, germacrone, (R)-(-)-xanthorrhizol, and (-)-beta-caryophyllene epoxide} which were predicted to have potential to be developed as HNMT inhibitors. This was based on the results of the molecular docking study as well as the predictive value of the ADMET in these secondary metabolites.

Conclusion: This study found several secondary metabolites of *Nigella sativa* and *Curcuma xanthorrhiza* which had activity as HNMT inhibitors. However, the results of this study still need to be confirmed by further studies, both in vivo and clinical trials, before they are used widely.

Keywords: *Histamine N-methyltransferase, Nigella sativa, Curcuma xanthorrhiza, secondary metabolites, Molecular docking, ADMET prediction*

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PC-06

In Silico* Molecular Docking and ADMET analysis of compounds isolated from *Neocarya macrophylla

against three targets of SARS CoV-2 coronavirus

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Abstract

Background: The novel corona virus disease (COVID-19) which emerged in China is a highly transmittable and pathogenic viral infection caused by the SARS-CoV-2; the disease has been declared as a public health emergency of international concern. The unavailability of suitable therapeutic agents or vaccines is of great concern. The aim of this study is to perform *in silico* molecular docking and ADMET analysis of some compounds isolated from *Neocarya macrophylla* against three targets of SARS CoV-2 proteins (3C-like protease, spike protein and papain-like protease).

Methods: Phytoconstituents of *N. macrophylla* were screened against three targets of SARS CoV-2 proteins using AutoDock Vina while the ADMET analysis was performed using swissADME and admetSAR.

Results: The *in silico* computational studies revealed that the compounds (catechin, catechin-3-rhamnoside, quercetin and epicatechin) isolated from *N. macrophylla* can effectively bind with high affinity and lower energy values to the three targets proteins of SARS CoV-2 coronavirus. ADME-Toxicity analysis revealed that, the compounds have enhanced pharmacological properties.

Conclusion: The findings of this study have shown that, the plant *Neocarya macrophylla* contain effective ligands for SARS CoV-2 coronavirus inhibition and thus, should be studied further for effective therapeutic agents against COVID-19.

Keywords: *Neocarya macrophylla*, SARS-CoV-2, flavonoids, ADME-T

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PC-07

Synthesis and Study of thermal behaviour of Gum Katira SIPN(Semi-inter Penetrating Network)

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Abstract:

Background: Katira gum is naturally occurring polysaccharides containing mainly L-rhamnose and D-galactose sugar unit and small percent of D-galactouronic acid. Owing to enhance the commercial usefulness of gums, modification and physicochemical characterization of these polysaccharides is of significant importance.

Methods: A novel semi interpenetrating polymeric network (IPN) of Katira gum has been synthesized by using water in oil emulsion technique. Where, water phase consist of Gum Katira and PVA, while oil phase is of castor oil, Span 80 as emulsifier. Thermo-gravimetric analysis is a simple and accurate method for studying the decomposition pattern and the thermal stability of polymers. Major thermal transitions as well as activation energies of the major decomposition stages were determined.

Results: The thermal decomposition of semi-IPN was initiated at 251.53°C and 255.70°C, whereas the natural gum were thermally decomposed at 238.49°C. Thus, the initial weight loss temperature of semi-IPN increased by 13°C and 17°C than that of natural Gum katira, indicating that SIPN structure significantly improved the thermal stabilities of gum.

Conclusion: The Gum katira and glutaraldehyde based SIPN was found to be a cost effective and renewable potential candidate with excellent thermal stability to be used as an commercial gum.

Keywords: *SIPN, Katira Gum, Thermal Stability*

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PC-08

The enhancement of bone defect healing by the application of hydroxyapatite extracted from Indonesian limestone

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Abstract

Background: This study examined the effect of hydroxyapatite from Indonesian limestone towards the number of osteoblasts, fibroblasts and osteoclasts.

Method: Experimental laboratory study conducted with randomized post-test only control group design. Histological analysis undertaken to quantify osteoblasts, fibroblasts and osteoclasts. one-way ANOVA and LSD test were used as analysis method.

Results: The osteoblasts numbers in G3 were higher than in group G1 but lower than group G2. Osteoclasts numbers in G3 were significantly lower compared with group G1 and G2. The number of fibroblast were higher in G3 than that in group G1 and group G2.

Conclusion: Indonesian limestone Hydroxyapatite enhanced the bone defect healing by increasing osteoblasts and fibroblasts numbers and reducing osteoclasts numbers

Keywords: *Indonesian limestone, hydroxyapatite, osteoblasts, fibroblast, osteoclast*

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PC-09

Development and validation of HPLC method for the determination of curcumin entrapped in polymeric micellar powder

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Abstract

Background: Curcumin belongs to the family of curcuminoids, natural polyphenolic compounds that possesses neuroprotective properties, anti-inflammatory and anti-cancer. Its entrapment in micellar delivery systems was to improve the solubility and bioavailability. Thus, an efficient qualitative and quantitative analytical method is important part of curcumin analysis in the developed formulations.

Methods: A fast and specific HPLC method was developed for analyzing curcumin in such matrices. The HPLC was equipped with diode array detector and a C18 column, 250 x 4 mm, 5 µm. The assay employed an isocratic elution of curcumin using a mobile phase composition of water (1%, v/v acetic acid) and acetonitrile (50:50, v/v). The flow rate was 1.0 mL/min and the analyte examined at 421 nm.

Results: An effective analysis in HPLC was successfully achieved by the predetermined HPLC condition. All the parameters of validation were in the acceptable range. A good resolution of peaks at the employed flow rate was achieved. The assay method was found to be linear from 10 to 50 µg/ml.

Conclusion: The developed method was practically effective to qualitatively identified curcumin. In addition, the assay also effectively quantified the amount of curcumin in the polymeric entrapping matrices which demonstrates that it has great potential to be used in natural compound analysis.

Keywords: *curcumin, hplc assay, micellar powder*

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PC-10

In Silico Study of Antiosteoporosis Effect of Compounds from *Chrysophyllum cainito* L. Leaves Against 3OLS Protein

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Abstract

Background: Estrogen deficiency causes various health problems in postmenopausal women, including osteoporosis. Phytoestrogen emerged as a potential alternative of estrogen with minimum side effects. The aims of this study were to analyze the metabolite profiling result of fractions of *Chrysophyllum cainito* L. through in silico study against 3OLS protein, an X-ray protein of ER β , so it can predict the types of the phytoestrogens contents which have antiosteoporosis property.

Methods: In silico analysis was carried out for the compounds from the metabolite profiling data of *Chrysophyllum cainito* L. leaves from our previous study. The compounds from various fractions were prepared with Avogadro 1.90.0 software, molecular docking was done using PyRx 0.8 software, and Biovia Discovery Studio Visualizer 2016 software was used to visualize the structure of compounds against 3OLS protein. The physicochemical characteristics of the compounds were analyzed using the SwissADME webtool.

Results: From in silico studies, it was known that there were total 11 compounds in *Chrysophyllum cainito* L. leaves that predicted as phytoestrogens which have 17 β -estradiol agonist properties against 3OLS protein. The 17 β -estradiol agonist was a compound that has parameters similar to 17 β -estradiol in its interaction with 3OLS protein, which has a pharmacophore distance of 10.862 Å, and binding to amino acids His 475 and Glu 305 or Arg 346 at receptor-ligand docking simulation.

Conclusion: *Chrysophyllum cainito* leaves contain compounds that are predicted to be phytoestrogens with 17 β -estradiol agonist property, which is responsible for antiosteoporosis activity.

Keywords: *Antiosteoporosis, Chrysophyllum cainito* L., phytoestrogen, in silico.

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PC-11

Phyllanthin and Hypophyllanthin, the Isolated Compounds of *Phyllanthus niruri* inhibit protein receptor of Corona Virus (COVID-19) through in Silico Approach

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Abstract

Background: *Phyllanthus niruri* has been known as an immunomodulator and also reported to possess an antiviral activity against several RNA viruses, such as hepatitis B virus and hepatitis C virus by inhibiting viral entry and replication. Since the current situation of corona virus (COVID-19) which infected among the world and caused severe disease and high morbidity, it urgently needed to find new agents against COVID-19. Therefore in silico screening against COVID-19 receptors is carried out as an initial stage of drug discovery. This research aimed to evaluate the activity of phyllanthin and hypophyllanthin, isolated from *Phyllanthus niruri*, in inhibiting spike glycoprotein (6W41) and main protease (5R7Y) which play as target receptors of COVID-19.

Method: Molegro Virtual Docker 5.5 used to determine the best binding energy through the rerank score which shows the total energy bonds calculation. The rerank score of those compounds will be compared by its native ligand of receptors where the lowest energies indicate a strong and stable bond againstreceptor.

Result: Phyllanthin and hypophyllanthin gave the lower rerank score than their native ligand. The rerank score of 5R7Y showed -90.65187 kcal/mol for phyllanthin, -89.20210 kcal/mol for hypophyllanthin, and -67.36807 kcal/mol for native ligand. Meanwhile, the rerank score of 6W41 showed -84.20543 kcal/mol for phyllanthin, -94.28683 kcal/mol for hypophyllanthin, and -73.28850 kcal/mol for native ligand. This result indicated that phyllanthin and hypophyllanthin have a stronger interaction than the ligands both in spike glycoprotein (entry inhibitor) and main protease (translation and replication inhibitor)

Conclusion: In conclusion, phyllanthin and hypophyllanthin predicted to have strong activity against COVID- 19 through inhibiting spike glycoprotein and main protease under in silico study. Further research is needed to support the discovering of COVID-19 through bioassay studies.

Keywords: COVID-19, In silico, *Phyllanthus niruri*, Phyllanthin, Hipophyllanthin

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PC-12

Development of PCR Method to Detect the *mecA* gene in *Staphylococcus aureus* bacteria

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Abstract

Background: Infectious diseases caused by *S. aureus* are acne, boils, impetigo and wound infections. Other more severe infections include pneumonia, mastitis, phlebitis, meningitis, urinary tract infections, osteomyelitis, and endocarditis. The detection of *S. aureus* bacteria by conventional means can use the culture method. However, the culture method has several drawbacks: it requires a biosafety level 2 laboratory infrastructure, requires experts, takes a long time to get positive results. Therefore, this study aims to develop a fast and accurate detection for *S.aureus* detection using the Polymerase Chain Reaction (PCR) method.

Methods: Polymerase Chain Reaction (PCR) method

Results: This method has been developed along with the discovery of genes contained in *S. aureus* bacteria such as *mecA*. The research stages consisted of *S. aureus* culture, DNA isolation, DNA amplification, electrophoresis, and data analysis. The results obtained with *mecA*-F: 5 'TCCAGATTACAACCTTCACCAGG 3' primers and *mecA*-R: 5 'CAATTCATCTTGTAACG 3' primers can carry out the *mecA* gene with a product length of 161 bp.

Conclusion: The PCR method can be used to examine the *mecA* gene in *S.aureus* bacteria.

Keywords: DNA, electrophoresis, *mecA* gene, PCR, *S.aureus*

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PC-13

Betulinic acid derivatives as anti-HIV drug candidates: in silico evaluation of their physicochemical and pharmacokinetic profiles (ADMET)

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Abstract

Background: The high prevalence of people with Human Immunodeficiency Virus (HIV) has become a special concern in the health sector. HIV is a virus that causes Immunodeficiency Syndrome (AIDS), which is characterized by a significant decrease in CD4 + T cells and damage to the immune system. The problem becomes complex because the antiretroviral therapy that has been used so far causes side effects and toxicity. Betulinic acid (BA) and its derivatives (BA1-9) were reported as anti-HIV *in vitro* assay. The physicochemical properties and pharmacokinetic profile of those compounds as oral drug candidate has not described.

Methods: *In silico* test to predict physicochemical properties using ChemDraw 17.0, while prediction of pharmacokinetic profile (ADMET) using online pkCSM tool.

Results: ChemDraw 17.0 analyses showed that the tested betulinic acid derivatives had physicochemical properties : five derivatives have a molecular weight value > 500 g / mol; LogP > 5; 2-5 Hydrogen Bond Donors; 3-7 hydrogen bond acceptors; tPSA < 140 Å; and the number of freely rotatable bonds 5-20. The pkCSM analyses showed that the tested compounds had good intestinal absorption with absorption values of 51% - 100%, low skin permeability, and were distributed to plasma. In addition, all these compounds are predicted not to be distributed to the brain because of the low permeability value of the blood brain barrier (BBB). All test compounds were also not cytochrome P450 inhibitors and had total clearance values ranging from log -1.078 to 0.182 ml / min / kg. However, it is known that only 6-9 compounds are not hepatotoxic.

Conclusion: The results of ADMET predictions (absorption, distribution, metabolism, excretion, toxicity) of betulinic acid derivatives show compounds 6-9 potential to be further tested as HIV drug candidates.

Keywords: *Betulinic acid derivatives, in silico, physicochemical properties, pharmacokinetic profile (ADMET)*

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PC-14

Synthesis, ADMET Predictions, Molecular Docking Studies, and *in-vitro* Anticancer Activity of Some Benzoxazines against A549 Human Lung Cancer Cells

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Abstract

Background: About 75 % of lung cancer is non-small cell lung cancer (NSCLC) type. Overexpression of epidermal growth factor receptor (EGFR) which causes the growth of normal lung cells to become uncontrollable, which may lead to become cancer. This study aimed to synthesize a series of benzoxazines (**1-5**) to be examined as EGFR inhibitor by *in silico* study. We also conducted the Absorption, Distribution, Metabolism, Excretions and Toxicity (ADMET) properties evaluation and also examined *in-vitro* anticancer assay on human lung cancer cells line, A549.

Methods: Benzoxazines (**1-5**) were synthesis by reacting anthranilic acid and benzoyl chlorides. The structures of the compounds were determined with ¹H, ¹³C-NMR, HRMS and FT-IR spectrometric method. Prediction of ADMET was using online pkCSM, and the molecular docking studies using MVD with EGFR- TKIs as the target (PDB ID: 1M17). *In vitro* assay of anticancer activity was performed by MTT assay.

Results: Compound **1-5** were successfully synthesized in good yields (71-84%). The ADMET prediction showed that benzoxazines can be absorbed through GIT, metabolized by CYP 450, not hepatotoxic. The title compounds had greater Moldock Score than erlotinib, and compound **3** had the highest activity against A549 compared with other benzoxazines, IC₅₀ = 36.6 µg / mL.

Conclusion: From the result, we need to synthesize benzoxazines with other substituents that can enhance its activity against human lung cancer cell, A549.

Keywords: *synthesis, benzoxazines, ADMET, pkCSM, molecular docking, 1M17, A549*

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PC-15

Characterization of phenolic compounds using LC/Q-TOF MS and the evaluation of alpha glucosidase of *Parkia speciosa*

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Abstract

Background: *Parkia speciosa* is a medicinal shrub that belongs to Fabaceae. It has been traditionally used in the treatment of diabetes mellitus in south Asia. This study aimed to identify the phenolic and flavonoids compounds from *P. speciosa* using ultra-performance liquid chromatography with quadrupole time of flight mass spectrometry (LC/Q-TOF MS).

Methods: n-Hexane, Chloroform, ethyl acetate and methanol were obtained via partitioning of the 95% ethanolic crude extract. The resultant extracts were evaluated their α -glucosidase inhibitory potential followed by metabolites profiling using LC/Q-TOF MS.

Results: A total of 21 compounds, including 16 flavonoids (kaempferol derivatives and quercetin derivatives) and 5 phenolics (gallic acid, catechin derivatives) compounds were identified. Ethyl acetate fraction was as found to be rich in both phenolic and flavonoid contents

Conclusion: The findings suggested that the ethyl acetate fraction of *P. speciosa* extracts showed significant activity and can be used as a new candidate of anti-diabetic drug.

Keywords: *Parkia speciosa*, LC/Q-TOF MS, α -glucosidase, Phenolic acids

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PC-16

Standardization of Flavonoids Component by Using Chromatographic Fingerprinting Techniques

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Abstract

Background: Flavonoids are the secondary metabolite present in the herbal medicines and imparts foremost role in the treatment of various types diseases. Presently, the enhancing use of natural products demand the needs of better method of standardization for qualitative and quantitative determination of flavonoids. The chromatographic fingerprint analysis is the best tool for the characterization of different types of flavonoids in herbal medicines. Similarly, it can be used for the quantification of flavonoids in natural products. The aim of this review was to collect all available scientific literature published on chromatographic fingerprint analysis for standardization of flavonoids.

Methods: The present review includes various references compiled from major databases as Chemical Abstracts, Science Direct, SciFinder, PubMed, Google scholar, CIMER, and IntelliHealth.

Results: A comprehensive investigation of literature uncovered that chromatographic fingerprints acquired by HPLC, HPTLC, GC-MS-LC-MS techniques, are intensely endorsed for the identification and quantification of flavonoids. Through this review, the author expects to motivate the natural product researchers throughout the globe to emphasis on the reported potential of flavonoids, and it may be beneficial in developing novel natural products with better therapeutic value.

Conclusion: The findings of chromatographic fingerprint analysis from different medicinal plants assist as a promising standardization tool for the flavonoids compound.

Keywords: *Flavonoids, Standardization, Chromatographic Finger printing, HPTLC*

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PC-17

DETECTION OF ZEIN GENE OF CORN (*Zea mays*) AS ANOTHER MATERIAL IN ARABICA COFFEE POWDER (*Coffea arabica*) WITH GEL-BASED PCR METHOD

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Abstract

Background: Arabica coffee (*Coffea arabica*) is a high-quality coffee and the most consumed in the world, this matter makes it vulnerable to counterfeiting Arabica coffee products using cheaper ingredients, one of which is corn (*Zea mays*). This study aims to detect the corn Zein gene in Arabica coffee powder on the market with the Gel-based PCR method.

Methods: The research samples in this study were divided into two groups there is control samples: raw corn (*Zea mays*), raw coffee beans (*Coffea arabica*), and test samples: four samples of Arabica coffee powder (*Coffea arabica*) on the Indonesian market. In this study, the simplex PCR method with the primer pair that is the Zein gene, and the control primer pair, the ClpP gene as an Arabica coffee gene. this section consists the brief essential material and methods or procedures used in research study.

Results: The results of this study are the four test samples show a band that is parallel to the size of 87 bp (Zein gene band).

Conclusion: all test samples (Arabica coffee powder on the market) suspected to contain the Zein gene, the corn gene.

Keywords: *Coffea arabica*, *Gel-Based PCR*, *Zea mays*, *Zein gene*

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PC-18

Probiotic characteristics of lactic acid bacteria fermented from food origin

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Abstract

Background: Probiotics have become a concern for their enormous benefits to human health. The most commonly used probiotic strains are lactic acid bacteria, gram-positive microbes. The genus *Lactobacillus* is one of the probiotics that has been widely known for its benefits directly or indirectly in its host. The characteristics of probiotic bacteria are safe for humans and can reach the intestines with sufficient living conditions so that they can reproduce and colonize while in the intestine. This study aims to examine the characteristics of *Lactobacillus acidophilus* fermented from fruit juice and *Lactobacillus reuteri* from fermented cow's milk as probiotics.

Methods: In vitro study were used to test the ability of *Lactobacillus acidophilus* and *Lactobacillus reuteri* as probiotic candidates to survive at pH 2; 2.5; 3.2; and 7.2, resistance to bile salts, resistance to pathogenic bacteria (*E. coli*, *S. aureus* and *E. faecalis*) and resistance to tuberculosis antibiotics.

Results: *Lactobacillus acidophilus* and *Lactobacillus reuteri* were able to survive in various acid pH and bile salt. These bacteria also have antimicrobial properties against pathogenic bacteria in the digestive tract and can be used with tuberculosis antibiotics.

Conclusion: Probiotics are known to have a wide range of health benefits for human health, including antimicrobial, anti-inflammatory and immune system modulation. The results showed that *Lactobacillus acidophilus* from fermented fruit juice and *Lactobacillus reuteri* from fermented cow's milk fulfilled the characteristics as a probiotic candidate and could potentially be used in tuberculosis patients.

Keywords: *Lactobacillus acidophilus*, *Lactobacillus reuteri*, pH, Oxgall, pathogen, tuberculosis

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PC-19

In Silico Screening of Potential Essential Oil of *Mentha piperita* and *Cymbopogon citratus* Against Covid-19 by Targeting Angiotensin-Converting Enzyme 2 (ACE2) and Aminopeptidase (APN): Molecular Docking Approach

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Abstract

Background: COVID-19 is a type of disease caused by a virus from the coronavirus class, namely SARS- CoV-2. This disease is becoming a pandemic, which needs solution. This study aims to screen the essential oil of *M. piperita* and *C. citratus* using a molecular docking approach by inhibiting the attachment and entry process through the ACE 2 receptor protein (Q9BYF1) and APN (P15144). *M. piperita* has 7 active essential oil, while *C. citratus* has 10 essential oil.

Methods: This study screens for ACE 2 and APN inhibition activity using molecular docking approach and screening the binding affinity using Pyrex Autodock Vina software. Docking results were stored and visualized using Biovia Discovery Studio and PyMOL

Results: The results of this screening show with ligand the highest binding affinity against ACE 2 and APN is patchouli alcohol (-6.9 kcal/mol) from *C. citratus*. The inhibition patchouli alcohol in APN were on Asn 667 and Ser 701.

Conclusion: Studi *in vitro* anti Covid 19 activity essential oil to be studied further for complete understanding and confirmation of their inhibitory potential.

Keywords: Essential oil; *Mentha piperita*; *Cymbopogon citratus*; COVID-19; ACE 2; APN

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PC-20

Inhibitory activity of *Urena lobata* leaf extract on alpha-amylase and alpha-glucosidase: *in vitro* and *in silico* approach

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Abstract

Background: Alpha-glucosidase (α -glucosidase) and alpha-amylase (α -amylase) are enzyme that responsible for conversion carbohydrate into glucose. Inhibition both of the enzyme can prolong absorption of glucose in intestine and control blood glucose concentration, moreover, it is beneficial for type 2 diabetes treatment. Empirically, *Urena lobata* (*U. lobata*) is used to cure diabetes, however the inhibitory activity on α -glucosidase and α -amylase have not been evaluated. The objective of study to examine anti-diabetic potency of *U. lobata* leaf extract through inhibition of α -amylase and α -glucosidase.

Methods: *U. lobata* leaf extract was obtained through extraction process using ethanol, therefore active compounds in the extract was analyzed by Liquid Chromatography–Mass Spectra (LC-MS). The inhibitory activity of *U. lobata* on α -glucosidase and α -amylase were evaluated by *in-silico* using docking server, meanwhile, *in-vitro* study using paranitrophenyl- α -D-glucopyranoside (α -NPG) and strach as substrat. The data was stated as the mean \pm SD and the IC-50 value was calculated by linear regression curve fit using SPSS.

Results: *U. lobata* leaf extract showed inhibitory activity on α -glucosidase and α -amylase with the IC-50 value was 43.73 μ g/ml and 83.73 respectively, meanwhile, acarbose as standart have IC-50 value at 1.14 μ g/ml and 0.08 g/mL. Molecular docking study indicated β -sitosterol and stigmasterol from *U. lobata* extract have a huge inhibitory activity both on α -amylase and α -glucosidase based on Inhibition constant (Ki) value.

Conclusions: Ethanolic extract of *U. lobata* have inhibition activity on α -glucosidase stronger than on α -amylase as anti-diabetic.

Keywords: anti-diabetic, enzyme, molecular docking

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PC-21

Identification of novel 5-HT_{1A} antagonists and reuptake inhibitors via homology modelling, docking screening and molecular dynamics simulation

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Abstract

Background: Serotonin/5-HT antagonist and reuptake inhibitors (SARIs) ameliorate depression by increasing the terminal 5-HT through activation of somatodendritic 5-HT_{1A} autoreceptors. In addition to similar efficacy and tolerability to SSRIs in treating major depressive disorder (MDD), SARIs improve the unpleasant side effects associated with SSRI-treated depression. However, the few available ones also produce some serious aftereffects, thus, a search for alternatives with enhanced pharmacological effects becomes imperative. This study aims at the identification of novel potential SARIs using a network of computational and bioinformatic tools.

Methods: Pharmacophore features were modelled using LigandScout 4.3, validated through ROC, EF and GH scores, and then used for the screening of molecular databases. Molecular docking was employed for virtual screening of the retrieved ligands against the homology 5HT_{1A} model receptor, then molecular dynamics simulations. ADMET properties of the selected ligands were also determined for pharmacokinetics characters and drugability.

Results: The best pharmacophore hypothesis possesses AUC (ROC), EF and GH scores of 0.7, 30.9 and 0.6 respectively, thus validated and used for database screening. The modeled 5-HT_{1A} homology receptor having satisfied the validation protocols was employed for molecular docking and dynamics simulations. From the IBS database, **STOCK6S-36853**, **STOCK7S-36094**, **STOCK3S-94557**, **STOCK7S-28769** and **STOCK5S-36248** interacted strongly against the receptor with docking scores of -8.735, -8.677, -8.140, -7.911 and -7.710, and binding free energy of -29.72 kcal/mol, -38.87 kcal/mol, -29.85 kcal/mol, -7.65 kcal/mol and -34.71 kcal/mol respectively, and satisfy the BDDCS RO5.

Conclusion: Computational and bioinformatic tools have been used to identify potential SARIs for further development into therapeutics.

Keyword: *Pharmacophore modelling, homology, docking simulation, molecular dynamics, antidepressant, drug discovery*

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PC-22

Design and Evaluation of Self-Nanoemulsifying Drug Delivery System (SNEDDS) Containing Wualae Fruit (*Etilingera elatior* (JACK) R.M. Smith) Extract

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Abstract

Background: Wualae (*Etilingera elatior* (Jack) R.M Smith) is one of the Zingiberaceae family plants that is empirically used as traditional medicine and food ingredients. The preparation of natural components can use many methods. One of them is the Self Nano Emulsifying Drug Delivery System (SNEDDS) technique. This system's benefit is to increase the bioavailability of active substances, improve solubility, and increase the absorption of active substances in the body.

Methods: SNEDDS preparation of ethanol extract Wualae fruit uses VCO and olive oil as oil phase, Tween 20 and Tween 80 as surfactants, and PEG 400 and Propylene glycol cosurfactants. The determination of SNEDDS components in 16 formulas was determined based on mixing, emulsification time, and clarity.

Results: Based on the optimization, the development of the optimum formula in F6 with 1 mL of VCO: Tween 80:PEG 400 is 1:7:2 with emulsification time for 22,5 seconds, 99.8% of clarity, 14.6 nm of size droplet, 0,138 of particle distribution, +4.4 MV of zeta potential and stable in stability testing with centrifugation test, heating at 40°C and cooling at 4°C, and freeze-thaw at -21°C and 25°C.

Conclusion: Wualae fruit extract showed good mixing in VCO as the oil phase, Tween 80 as a surfactant, and PEG 400 as a cosurfactant.

Keywords: *Wualae, SNEDDS, VCO, Tween 80, and PEG 400*

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PC-23

Formulation and characterization of Cationic Nanoemulsions a promising delivery system for topical antimicrobial therapy

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Abstract

Background This study describes the optimization of stearylamine-tea tree oil based nanoemulsions as cationic nanoemulsion obtained by means of a spontaneous emulsification process used as topical antimicrobial therapy.

Aim The aim of the current study was to formulate and characterize cationic-charged bilayered nanoemulsion based on tea tree oil which may act in synergistic with fusidic acid as the model drug to eliminate methicillin-sensitive Staphylococcus aureus (MSSA) and methicillin-resistant Staphylococcus aureus (MRSA) which could infect skin lesions

Materials & methods: The developed carriers were characterized for thermodynamic stability, pH, particle size, zeta potential, conductivity, antibacterial activity MIC and MBC test, cell viability assay in human dermal fibroblast cell lines, invitro cellular uptake

Results: The developed cationic bilayered nanoemulsion was thermodynamically stable also with promising physicochemical properties and potential enhanced drug cellular uptake, reduction in bacterial load and decrease the possibility of future drug resistance.

Conclusion: The results obtained encourages further exploration of the cationic nanoemulsion in the treatment of MSSA and MRSA infection for topical applications. The formulation of the cationic nanoemulsion will be further enhanced with the incorporation of suitable gelling agent and its permeability, contact time and in vitro activity will be determined accordingly

Keywords: *fusidic acid, tea tree oil, MIC, MBC*

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PC-24

Liposomal formulation prepared with different types of phospholipids for delivery of doxorubicin

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Abstract

Background: The selection of lipid components of membrane bilayer determines the rigidity of liposomes affecting drug efficacy. In this work, liposomes composed of rigid lipid, hydrogenated soybean phosphatidylcholine (HSPC), were totally or partially substituted with 1-palmitoyl-2-oleoyl-sn-glycero-3-phosphocholine (POPC) and 1,2-dioleoyl-sn-glycero-3-phosphoethanolamine (DOPE). The present study aimed to evaluate liposomes with different rigidity for delivering doxorubicin (DOX), an amphipathic drug molecule with Log P value of 0.49-1.42.

Methods: Liposomes were prepared using a thin layer hydration method. Liposomes were prepared with lipids (HSPC, POPC) with and without combination with DOPE, cholesterol, and DSPE-mPEG2000 with a molar ratio of 57: 38: 5. Then, *in vitro* drug release and cytotoxicity, furthermore an *in vivo* antitumor activity of these liposomes were evaluated.

Results: Liposomes loading DOX prepared using different lipids showed similar particle sizes, which were about 100 nm with negative ζ -potential values of between -19 mV to -29 mV. Substitution of HSPC with POPC and also DOPE addition into liposomes decreased the DOX encapsulation efficiencies. These lipids substitution increased DOX released from the liposomes. The cytotoxicity assays of DOX liposomes composed of POPC on C-26 colon cancer cells and LLC cells shows similar IC₅₀ values with DOX solution. The DOPE addition to DOX liposomes reduced the antitumor activity.

Conclusion: In conclusion, the lipid substitution of HSPC with POPC or DOPE reduced liposomes rigidity as well as increased DOX release; however, it reduced antitumor activity *in vivo*.

Keywords: *liposomes, HSPC, POPC, DOPE, doxorubicin*

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PC-25

Design derivatives of gossypetin, a naturally occurring flavonoid in *Hibiscus sabdariffa*, and molecular docking as antibacterial agents

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Abstract

Background: Gossypetin isolated from the flowers of *Hibiscus sabdariffa* reported as bioactive substance responsible for antibacterial activity of the extract. This study were purposed to design acyl gossypetins which increased activity of the parent compound and to find the most potent compound as antibacterial agent.

Methods: Design of twenty six gossypetin derivatives was conducted through conjugation of gossypetin with acyl from some natural phenolic acids. Docking simulation on bacterial DNA gyrase (PDB. 1KZN) was performed by Molegro Virtual Docker and molecular interaction was visualized and inspected using Discovery Studio. Potency as antibacterial agents were evaluated based on their binding affinity, hydrogen bond, and binding pattern similarity with original ligand.

Results: Allmost all of derivatives showed higher binding affinity than gossypetin. The most active compound was 3,7,3'-trimethylgossypetin ester of coumaric acid with docking score -167.42 kcal/mol, comparable with co-crystallized ligand CBN (docking score -167.75 kcal/mol). The other compounds with high affinity were belonging to 7,4'-dimethyl- and 3,7,3'-trimethylgossypetin ester of coumaric acid, caffeic acid, and also ferulic acid. All of this compounds interacted with amino acid Asn46 similar to CBN.

Conclusion: The acyl gossypetin can increase the activity of gossypetin from *Hibiscus sabdariffa* L. as antibacterial agents and the 3,7,3'-trimethylgossypetin ester of coumaric acid was the most potent compound.

Keywords: *gossypetin, phenolic acid, conjugation, docking, DNA gyrase, antibacterial activity*

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PC-26

Designing of Suitable Peptide-Based Inhibitors of Dengue Virus NS2B–NS3 Proteases Using Computer-Aided Design Approach

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Abstract

Background: Dengue virus infections have affected approximately 100 million people annually, unfortunately the researchers still struggling to find an effective treatment to treat it. NS2B/NS3 complex plays an essential role in the cleavage of the viral precursor protein and peptidic ligand prefers to bind at that site to make a suitable for dengue vaccine target.

Methods: A peptide Asn-Arg-Arg-Arg-Arg-Ser-Ala-Gly-Met-Ile (NRRRRSAGMI) from the capsid's cleavage region was reported to form the highest number of hydrogen bonds with the protease NS2B/NS3, hence we design our base linear heptapeptide, RRRSAGM ARRSAGM, RARSAGM, and RRASAGM from that sequence and made them into classes of tri, tetra, penta, hexa and heptapeptides. For this study, MOE program was used for the docking of our 41 proposed peptides to the NS2B/NS3 protease from Wichapong et al., 2009 homology model. An Amber99 forcefield, Alpha PMI ligand placement and Affinity dG scoring methods were used for this experiment. Peptides with the lowest S score (best binding affinity) and binds with the catalytic triad (His 51, Asp 75 and Ser 135) were selected as the possible best candidate for NS2B-NS3 antagonist.

Results: Tri 1.3 (Arg-Ser-Ala) has the best result as it binds with all of the catalytic triads with the lowest S score value which was -3.9307 followed by Tri 3.2 (Ala-Arg-Ser) (-3.9307), Tetra 1.2 (Arg-Arg-Ser-Ala) (-2.7803) and Tri 2.1 (Ala-Arg-Arg) (-2.6230).

Conclusions: As a conclusion, Tripeptide and tetrapeptide is the most suitable length to produce NS2B/NS3 antagonist. Although we find a possible NS2B/NS3 protease antagonist, in-vivo and in-vitro studies need to be conduct.

Keywords: dengue virus, dengue vaccine, NS2B/NS3 protease, peptidic ligand, Molecular Operating Environment.

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PT-01

Recent advancement of dendrimers in different cancer research with special reference to its patent

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Abstract

Background: Cancer is the major causes of deaths worldwide, the tumor seems to be uncontrolled growth of cell and it also damage to others cell of the body. It has been revealed that around 14.1 million people were diagnosed with cancer in the year 2012 and around 8.2 million people died due to cancer. There are various approaches for the treatment of cancer such as liposomes, niosomes, polymeric nanoparticles, and dendrimers. From this approaches dendrimers found to have extensive outcomes in tumortargeting.

Methods: Dendrimer in Greek word "Dendron's" meaning tree or branch. The dendrimer hold the excellent properties as a drug carrier such as monodispersity, nanoscopic size, and multiple functional groups at the periphery, reproducibility and biocompatibility. Dendrimers have the capability to upsurge the solubility and bioavailability of hydrophobic drugs. The dendrimer biocompatibility should be improved by the acetylation, PEGylation, glycosylation and amino acid functionalization. Dendrimers comprising of highly branched polymers, internal hydrophobic cavity and multiple peripheral functional groups consisting of internal diameter 2-10 nm range.

Results: The anticancerous drugs either incorporate into the voids of dendrimers or conjugated to their functional groups at the surface. The targeting ligands binds to the surface of dendrimers for better selectivity of cancerous cells and it did not causes any harm to normal cells. The functional group (Nucleic acid) present in the dendrimer which forms complex with positively charged surface of cationic dendrimers and this approach is widely used for cancer treatment.

Conclusion: This review highlights the recent outcomes of dendrimers with special emphasis on cancer treatment.

Keywords: *Dendrimers, PEGylation, Nucleic acid, Monodispersity*

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PT-02

The in vitro cellular uptake and cytotoxicity of ursolic acid niosome coated with chitosan

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Abstract

Background: Ursolic acid (UA) has been reported to be effective for hepatocellular carcinoma therapy. However, it has low water solubility and permeability limiting its therapeutic effects. This study aimed to evaluate the effects of chitosan coating on the cellular uptake and cytotoxicity of niosomes loaded ursolic acid.

Methods: Niosomes composed of ursolic acid, span 80, and cholesterol were prepared by thin-layer method. The cellular uptake study was then evaluated on HeLa cells. The cytotoxicity was further evaluated by MTT assay on HeLa and Huh7it cells.

Results: The results showed that the addition of chitosan increased the particle sizes, which was from $198,7 \pm 13,8$ nm to $237,7 \pm 6,2$, and ζ -potentials, which were of $-57,50 \pm 11,87$ mV to $3,88 \pm 1,55$ mV. The niosomes loaded ursolic acid with chitosan layers had higher IC_{50} in HeLa cells than without chitosan, which were $12,904 \mu\text{g/mL}$ and $10,938 \mu\text{g/mL}$, respectively. On the other hand, the study on Huh7it cells revealed that the addition of chitosan into niosomes resulted in low cytotoxicity. The cellular uptake of niosomes with the chitosan addition; had relatively higher fluorescence intensity than that of without chitosan. In addition, cell pre-treatment with sucrose inhibited niosomal cellular uptake, which may indicate that clathrin-mediated endocytosis has an important role in the cellular transport of niosomes.

Conclusion: In conclusion, the addition of chitosan layers increased the particle size and ζ -potentials and improved cellular uptake and cytotoxicity in the HeLa cells.

Keywords: *ursolic acid, niosome, chitosan, cytotoxicity, IC_{50} , cellular uptake.*

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PT-03

The thermodynamics of p-methoxycinnamic acid – cyclodextrin inclusion complex

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Abstract

Background: p-methoxycinnamic acid (pMCA) is an active compound contained in the rhizome of *Kaempferia galanga* Linn. which has low water solubility. One of the methods that can be considered to increase the solubility of compounds is inclusion complexes. The formation of the inclusion complex is due to the compatibility between the molecular size of the guest compound and the inner cavity of the cyclodextrin and the thermodynamics of the interaction. This study aimed to evaluate the thermodynamics of the formation of pMCA-cyclodextrin inclusion complexes.

Methods: The cyclodextrins used were β -cyclodextrin (β CD) and Hydroxypropyl- β -cyclodextrin (HP β CD), evaluated at pH 4.0 and 7.0 at three different temperatures.

Results: The results showed that the thermodynamic parameters of the pMCA-cyclodextrin interaction of the inclusion complex were exothermic ($\Delta H < 0$), spontaneously ($\Delta G < 0$), at pH 4.0 there was an increase in system irregularity (ΔS positive), while at pH 7.0 there is a decrease in system irregularity (ΔS negative).

Conclusion: From the results of the thermodynamic parameters, it can be concluded that the pMCA with β CD or HP β CD has been formed inclusion complex.

Keywords: *p-methoxycinnamic acid, β -cyclodextrin, hydroxypropyl- β -cyclodextrin, inclusion complex, thermodynamics*

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PT-04

Effect of VCO and Polyvinyl Alcohol on *Cocos nucifera* L. Antibacterial Peel Off Mask

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Abstract

Background: Kopyor coconut which has Virgin Coconut Oil contains lauric acid which has been known to have an antibacterial activity against *Propionibacterium acnes* to improve the severe of pimple. The aim is to investigate VCO in antiacne formula for antibacterial activity against *Propionibacterium acnes* ATCC 11827 in Nutrient agar.

Methods: Growth inhibition test was carried out by agar disk diffusion. The minimum inhibition concentration (MIC) of the VCO was 20%. In this research, VCO 20% and 30% were formulated as a component of emulgel peel off mask containing Poly Vinyl Alcohol (PVA) in various concentrations (8% and 10%). The emulgel peel off mask of VCO kopyor then evaluated the viscosity, pH, drying time, spreadability, particle size, particle size distribution, zeta potential, antibacterial activity, and also stability thermal cycling evaluation at the temperature $40^{\circ}\pm 2^{\circ}\text{C}$ and $4^{\circ}\text{C}\pm 2^{\circ}\text{C}$ in 3 cycles.

Results: Through this evaluation, the selected formula was formula 1 containing 20% of VCO and 8% of PVA. This formula has a pH that is suitable with skin pH 4.5-6.5, has no significant difference in zeta potential, good spreadability, and produced antibacterial activity that has no significance different from other formulas that contain more concentration of VCO and PVA.

Conclusion: This VCO peel off mask has potential as antiacne and antimicrobial agents.

Keywords: *Antibacterial activity, Propionibacterium acnes, PVA, Virgin Coconut Oil*

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PT-05

The stability and irritability study of the combination of chitosan-*Aloe vera* spray gel as wound healing

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Abstract

Background:

Chitosan is a natural polysaccharide widely used in various clinical applications including regeneration of skin tissue. *Aloe vera* has properties in healing burns on the skin, anti-inflammatory effect, and leaves a protective layer on the skin after drying so it provide protection to the wound. The purpose of this study was to determine the physical stability and the possibility of irritation that occurs from chitosan-*Aloe vera* spray gel application.

Methods: The spray gel stability test includes the organoleptic, viscosity, and pH were prepared by Thermal Cycling and centrifugation method. The irritation test was performed by Draize Rabbit Test method.

Results: Chitosan-*Aloe vera* spray gel characteristics has a weak yellow color, clear, and a strong *Aloe vera* odor. pH of the spray gel was $4,88 \pm 0,01$; and the viscosity was $36,50 \pm 0,23$ cps. The result from the chitosan-*Aloe vera* spray gel stability test showed a decrease of viscosity, while from the centrifugation test the viscosity of the preparation remained stable (unchanged). There was no difference in the pH and organoleptic observation from both test. Based on the scoring and analysis of the reaction in rabbit skin, the Primary Irritation Index (PII) obtained was 0,56.

Conclusion: According to response category from the acute dermal irritation test, it can be concluded that chitosan-*Aloe vera* spray gel had a slightly irritating effect.

Keywords: *chitosan, Aloe vera, stability, irritability study*

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PT-06

Potency of Mucoadhesive Gingival Patch Loaded With Mangosteem Rind on The Level of RANKL And OPG in Wistar Rat With Periodontitis

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Abstract

Introduction: Periodontitis is one of the oral infectious diseases that occurs on a wide scale all over the world. Periodontitis is characterized by alveolar bone loss as the result of bacterial pathogen-evoked inflammatory responses. The mucoadhesive patch is one of the topical drug distribution systems that does not irritate the mucosa and able to increase permeability. Based on phytochemical screening, mangosteem rind extract contains active ingredients that have high antibacterial and anti-inflammatory effects.

Objectives: To prove that the administration of mangosteem rind extract (*Garcinia mangostana*) mucoadhesive patch inhibit bacterial growth and alveolar bone loss.

Method: Laboratory experimental research with a post-test only control group conducted using 24 Wistar rats divided into 3 groups: control positive group (Doxycyclin patch application), the negative control group (mucoadhesive patch application) and the treatment group (mucoadhesive patch application of mangosteem rind extract). Induction of bacteria *P.gingivalis* 1×10^{10} CFU as much as 0.03ml 3 times at 2-day intervals. Application of mucoadhesive and tetracycline patch 1 hour/day for 7 days. two rats from each group will be sacrificed on days 3,5, and 7 after the application of mucoadhesive patches. Direct sandwich ELISA was used to determine the number of RANKL and OPG by serum blood.

Results: Research shows that mucoadhesive patch of mangosteem peel extract can significantly increase the number of RANKL ($P = 0.001$) and increase the number of OPG with no significant in all groups ($P = 0.176$).

Conclusion: Mucoadhesive patch of mangosteem rind extract can inhibit patch inhibit bacterial growth and alveolar bone loss in periodontitis by increases number of RANKL and OPG.

Keywords: *Antibacterial, Mangosteem rind extract, Mucoadhesive patch, Periodontitis*

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PT-07

Cocrystal Formation of Loratadine-Succinic Acid and Its Improved Solubility

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Abstract

Background: Loratadine belongs to Class II compound of Biopharmaceutics Classification System (BCS) due its low solubility and high membrane permeability. Cocrystal is a system of multicomponent crystalline that mostly employed to improve solubility. Succinic acid is one of common cofomer in cocrystal modification. This research aims to investigate cocrystal formation between loratadine and succinic acid and its effect on solubility property of loratadine.

Methods: Cocrystal of loratadine-succinic acid was prepared by solution method using methanol as the solvent. Cocrystal formation was identified under observation of polarization microscope and analysis of the binary phase diagram. Then, cocrystal phase was characterized by differential thermal analysis (DTA), powder X-ray diffraction (PXRD), Fourier transform infrared (FTIR), and scanning electron microscopy (SEM). Solubility study was conducted in phosphate-citrate buffer pH 7.0±0.5 at 30±0.5°C.

Result: Loratadine is known to form cocrystal with succinic acid in 1:1 molar ratio. Cocrystal phase has lower melting point at 110.9°C. Powder diffractograms exhibited new diffraction peaks at 2θ of 5.28, 10.09, 12.06, 15.74, 21.89 and 28.59° for cocrystal phase. IR spectra showed that there was a shift in C=O and O-H vibration, indicating intermolecular hydrogen bond between loratadine and succinic acid. SEM microphotograph showed different morphology for cocrystal phase. Loratadine solubility in cocrystal phase was increased up to 2-fold compared to loratadine alone.

Conclusion: Cocrystal of loratadine and succinic acid is formed by stoichiometry of 1:1 via C=O...H-O interaction. Cocrystal phase shows different physicochemical properties and responding to those properties, it shows improved loratadine solubility as well.

Keywords: *cocrystal; loratadine; physical characterization; solubility; succinic acid*

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PT-08

The development of sample preparation method based on silica dispersive solid phase extraction for clean-up and preconcentration of hydroquinone in whitening cream

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Abstract

Background: Cosmetic abuses are common problems in Indonesia during the increasing interest of cosmetics. One of them is the addition of hydroquinone in whitening creams which can trigger negative effects. However, the determination of hydroquinone in whitening creams are very challenging because creams are complex matrices. Therefore, an appropriate sample preparation method to extract, clean-up, and preconcentrate the hydroquinone from whitening cream is needed.

Methods: The extraction process was carried out by dispersing silicas in a sample solution which contained standard hydroquinone as model target analyte, then stirred using a hot plate stirrer. At the end of the extraction process, silicas were collected and desorbed using ethanol with the aid of vortex. The desorption solution was then analyzed by spectrophotometer UV-Vis at a wavelength of 294 nm. Several important parameters such as silica mass, extraction time, desorption time and pH of sample solution were optimized. The optimum extraction conditions were applied to analysis hydroquinone in real samples.

Results: The results obtained that the correlation coefficient (r^2) was 0.9947, the detection limit was 0.7996 ppm, the quantification limit was 2.6653 ppm, the percent recovery (% R) was in the range of 90-105.80%, the coefficient of variation (% KV) in the range of 0.0143% - 0.0288%. The determination of hydroquinone in three whitening creams showed concentration 96.788 ppm, 96.191 ppm, and 90.135 ppm with the value of %R using standard addition obtained from 94.7% - 110.95%, respectively.

Conclusion: Silica dispersive solid phase extraction for clean-up and preconcentration of hydroquinone in whitening creams were successfully developed.

Keywords: *Dispersive solid phase extraction, Hydroquinone, Silica, Spectrophotometer UV-Vis, Whitening cream*

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PT-09

Systemic delivery of antidiabetic drugs via transdermal route: a review

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Abstract

Background: Diabetes mellitus is a chronic illness in which the pancreas produces an insufficient amount of insulin or the insulin produced is unable to be used effectively by the body. Most oral antidiabetic drugs show low oral bioavailability and need to be taken more than once daily due to short half-lives, resulting in poor patient compliance. The transdermal delivery systems have appeared as a prospective hope in diabetes management due to the benefits that they offer as compared to invasive injection and oral dosage forms.

Methods: Several attempts have been made at the laboratory level to study the skin permeation and to develop transdermal therapeutic of various antidiabetic drugs, to avoid the drawbacks related with oral administration dosage form.

Results: This review presents an outline of the transdermal research specifically in the area of antidiabetic drugs reported in various pharmaceutical journals.

Conclusion: The transdermal delivery has gained a significant importance for systemic treatment as it is able to avoid first-pass metabolism and major fluctuations of plasma levels typical of repeated oral administration. As we can experience from this review article that transdermal delivery of different antidiabetic drugs improves bioavailability as well as patient compliance by many folds.

Keywords: *Diabetes, oral antidiabetic, transdermal delivery system.*

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PT-10

CHARACTERISTICS, PHYSICAL STABILITY, EFFECTIVENESS OF DERMAL COLLAGEN IMPROVEMENT AND ACCEPTABILITY OF TEMUGIRING

(*Curcuma heyneana* Val., & V. Zijp.) EXTRACT SCRUBS

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Background: Rhizome of temugiring (*Curcuma heyneana*) is used to prepare scrubs among Indonesian women. It contains curcumins as antioxidant.

This research aims to determine the dosage forms and cream type effects on the characteristics, physical stability, effectiveness of dermal collagen improvement, and acceptability. The formulas in this research were shake scrub, W/O cream and O/W cream scrubs

Method: Freeze and thaw cycle method was used in physical stability test. The effectiveness test was conducted using back skin of female mice exposed to 1140 mJ/cm² UV-B rays for 30 days. Ultrasonic assisted extraction was conducted to obtain ethanol extract of the rhizome.

Result: Organoleptically, the shake scrub was yellow, the W/O cream scrub is brownish yellow and semisolid, the O/W cream scrub is yellow and semisolid. All have distinctive aromas, and showed pH correspond to the skin pH. The W/O cream scrub did not meet the dispersive power requirement and was more occlusive. All formulas effectively improved the dermal collagen, O/W scrub showed the highest result. In preference, the shake scrub was the most acceptable. In feeling, the O/W cream scrub was the most acceptable. In ease of use, ease of scrub rubbed on skin parameter was acceptable for the shake scrub, ease of scrub removing on skin parameter was acceptable for the O/W cream scrub, and ease of scrub applied on skin parameter was acceptable for the W/O cream scrub.

Conclusion: Differences in dosage forms and cream types affect the characteristics, physical stability, effectiveness of dermal collagen improvement, and acceptability.

Keywords: scrub, temugiring, characteristics, collagen, acceptability

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PT-11

Optimisation of biomass-based cellulose hydrogels for topical drug delivery

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Abstract

Background: Hydrogels are hydrophilic polymer networks which can swell substantially. Therefore, hydrogels can act as drug reservoirs for topical drug delivery. However, hydrogels are mostly prepared from synthetic materials and the search for natural resources such as biomasses as a feedstock for hydrogel preparation is essential. Sodium hydroxide (NaOH)/urea solvent system is a common solvent for solubilising cellulose during hydrogel preparation. This study aims to optimise the cellulose hydrogels formation by evaluating the effect of NaOH and urea concentrations on hydrogel's physical properties and permeation of ibuprofen (IBU) through the skin.

Methods: Dissolving pulps of oil palm empty fruit bunches were hydrolysed and solubilised in different combinations of NaOH (6 – 8% w/v) and urea (4 – 6% w/v) before crosslinking to form hydrogels. Solubility and viscosity of cellulose solutions were determined. Swelling index (SI) and gel strength (GS) of reswollen hydrogels were measured. *In vitro* drug permeation study was conducted by using reswollen hydrogels in IBU solution.

Results: The variation of NaOH/urea compositions did not affect the solubility and viscosity of cellulose solutions. The SI increased with the increase of NaOH concentration whereas the GS decreased at high NaOH concentration. Hydrogels with 8% w/v NaOH were excluded from drug permeation study due to fragile characteristics. Urea concentration did not affect the hydrogel properties. Hydrogels with higher SI, namely with 7% w/v NaOH and 4% w/v urea was found to deliver more IBU into the skin.

Conclusion: The SI of hydrogels is mainly affected by NaOH concentration. Hydrogels with higher SI showed a better drug permeation profile.

Keywords: *biomass, cellulose hydrogel, alkali/urea solvent, swelling index, skin permeation*

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PT-12

Formulation and Evaluation of Antibacterial Novel Herbal Hand Sanitizer gel Containing Aloe Barbadensis Extract

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Abstract

Background: The main of the research work was to develop and characterize of Novel Herbal Hand Sanitizer gel Containing Aloe barbadensis extract for the effectiveness of the gel against bacteria on the palms of the hands. Isopropyl alcohol based novel hand sanitizer has gained more attention over the last several decades due to its reputable medicinal properties and from different pharmaceutical, health care product has been manufactured.

Methods: Herbal hand sanitizer gel was prepared and characterized with respect pH, viscosity, spreadability, phytochemical screening, In vitro drug release and physical stability. The anti-microbial activity of the formulated herbal hand sanitizer gel was tested against Escherichia coli, Staphylococcus aureus Candida albicans and Pseudomonas aeruginosa by agar pour techniques and Radical Scavenging Activity by the DPPH Assay.

Results: The gel base was optimized by preparing hand sanitizer formulations containing Carbomer and triethanolamine at ratios of 0.25%:0.5%, 0.5%:1%, and 0.5%:2% and mixed with aloe vera leaf extract sanitizer liquid. The herbal hand sanitizer gel was showed pH, viscosity, Spreadability was found 6.2, 50.02(cps), and 9.5 ± 0.12 g.cm/sec, respectively. The physical stability of hand gels containing aloe vera extract was measured at storing at room temperature and accelerated temperature and humidity (25 ± 20 C, 60 ± 5 % RH) and (40 ± 20 C, 75 ± 5 % RH) for up to six months.

Conclusions: The effectiveness of the gels was examined on the palms of 30 respondents. Moreover, significantly the study existent that herbal hand sanitizer gel of aloe vera can be promised to be effective enough and enhanced safe potential for the retention of palms of hands.

Keywords: *Hand sanitizer gel, Antibacterial, Minimum inhibitory concentration, Aloe barbadensis miller, Physical stability, spreadability*

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PT-13

The impact of glutaraldehyde on the characteristics of BHA-GEL-GEN-GTA implant as gentamicin delivery system

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Abstract

Background: The application of biomaterials as a drug delivery system targeting bone is increasing every year. However, the addition of drugs into biomaterials can weaken its mechanical properties. Crosslinkers are compounds that can improve the mechanical properties of biomaterials. This study aims to determine the effect of glutaraldehyde (GTA) concentration as a crosslinker on implant characteristics.

Methods: BHA-GEL-GEN-GTA implant with GTA solid content ranging from 0.1 to 1.4 was processed by direct compression. The compressive strength of implant was carried out using an autograph, while implant degradation test was carried out by dissolving the implants in PBS solution for several times. Implant toxicity was performed by MTT assay.

Results: There is a significant difference in the implants' compressive strength due to differences in crosslinker liquidity: Implants that crosslinked using GTA with solid content 0.1 in 2 mL of solvent had higher compressive strength than using GTA with the same solid content in 1 mL ($p < 0.001$). Furthermore, GTA with solid content of 0.6, 1, 1.2, and 1.4 increases the implants' compressive strength. From degradation test, an increase in GTA concentration increases weight loss and swelling of the implant. Cell viability in GTA with solid content 0.1, 0.2, and 0.4 are more than 50%.

Conclusion: BHA-GEL-GEN-GTA implants with 0.4 GTA showed stable swelling profile with low percentage of implant weight loss, and nontoxic in vitro. However, in vivo studies are needed to prove the effectiveness of implants in delivering drugs to bone tissue.

Keywords: *glutaraldehyde, bovine hydroxyapatite, bone implant, biomaterials, osteomyelitis*

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PT-14

Applicability of Mandua isolated polymer for formulation of floating aceclofenac microspheres

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Abstract

Background: Floating gastro-retentive microspheres have been used to prolong the gastric residence time after oral administration and improve the local effect of aceclofenac in the treatment of spondylitis, lumbago, pain caused by nonarticular heurism. Mandua, rich in starch and resistant starch is native and under-utilized crop of Uttarakhand.

Methods: In the present study, Mandua starch, was isolated using alkali extraction method. Isolated Mandua starch has been pre-gelatinized and used as polymer in combination with sodium bicarbonate for the formulation of floating gastro-retentive microspheres. Aceclofenac microspheres were prepared by crosslinking emulsion method using pre-gelatinized Mandua starch and epichlorohydrin at different concentrations. Sodium bicarbonate was used as gas releasing agent. Microspheres were characterized using the particle size, swelling index and drug release properties, FTIR, XRD.

Results: Spherical discrete microspheres with size ranging from 1 to 3 mm were obtained with drug entrapment efficiency of 72% w/w. The microspheres provided controlled release of Aceclofenac.

Conclusion: Modification of alkali isolated Mandua starch improved the gastric residence time. Mandua polymer can be utilized industrially for development of sustain released floating microsphere.

Keywords: *Floating microsphere, Aceclofenace , Gastric residence*

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PT-15

Effect of ratio D- α -tocopheryl polyethylene glycol 1000 succinate and poloxamer 407 on physical characteristics and dilution stability of mixed micelles (for delivery system of hesperetin)

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Abstract

Background: Hesperetin is a natural flavonoid and classified as BCS Class II. Micelle can improve its solubility and bioavailability by entrapped hesperetin into hydrophobic part in the core of micelle structure. The aim of this study is to investigate the influence of ratio of D- α -Tocopheryl Polyethylene Glycol 1000 Succinate (TPGS) and Poloxamer 407 (P407) on physical characteristics of mixed micelle and its stability against dilution.

Methods: The micelles were prepared using thin film hydration method. TPGS single micelle and three different ratios of TPGS and P407 mixed micelle were evaluated. Physical characteristics measured include particle size, critical micelles concentration (CMC) and encapsulation efficiency. The stability test was carried out by diluting micelles using phosphate buffer.

Results: Dynamic light scattering method showed that particle size of mixed micelle TPGS : P407 ratio 1 : 4 was bigger than the ratio 1:1 and 1:2. In general, particle size of mixed micelles were smaller compared to TPGS-only micelle. CMC value of mixed micelles TPGS:P84 was lower than CMC of TPGS and P407 only. Mixed micelles also exhibited greater encapsulation efficiency than TPGS-only micelle. The lowest CMC and the highest encapsulation efficiency was obtained in mixed micelles TPGS:P407 with ratio 1:4. Stability test by diluting micelle using phosphate buffer showed no precipitation of the mixed micelles until the dilution of 1:150.

Conclusion: In conclusion, increasing amount of poloxamer P407 in mixed micelles could form bigger particle size, lower CMC, greater encapsulation efficiency and good stability.

Keywords: *TPGS, Poloxamer 407, mixed micelle, physical characteristics, dilution stability*

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PT-16

Discovery of new targeting agents against GAPDH receptor for antituberculosis drug delivery

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Abstract

Background: Tuberculosis (TB), a tropical disease caused by *Mycobacterium tuberculosis* (*M. tuberculosis*) remains a public health concern due to the emergence and evolution of multidrug-resistant strains. To overcome this issue, reinforcing the effectiveness of first-line antituberculosis agents using targeted drug delivery approach is an option. Glyceraldehyde-3-Phosphate Dehydrogenase (GAPDH), a common virulence factor found in the pathogenic microorganisms has recently been discovered on the cell-surface of *M. tuberculosis*, allowing it to be used as a drug target for TB. This study aims to discover active small molecule(s) that target GAPDH and eventually enhance the delivery of antituberculosis drugs directly against *M. tuberculosis*.

Methods: Ten compounds with reported *in vitro* and/or *in vivo* activities against GAPDH were evaluated for their binding interactions through molecular docking studies using AutoDock 4.2 program. The compound with the best binding energy was then modified to further produce ten derivatives and these derivatives were redocked against GAPDH using previous protocols. BIOVIA Discovery Studio Visualizer v19.1.0.18287 was used to explore the ligand-receptor interactions between the derivatives and GAPDH.

Results: Among the ten compounds, curcumin, koningic acid and folic acid showed the best binding energies. Further analysis on the docking of two folic acid derivatives (γ -{[tert-butyl-N-(6-aminohexyl)]carbamate}folic acid and folic acid N-hydroxysuccinimide ester) showed that these molecules have a larger van der Waals radii at the glutamic acid sub-component and have a lower binding energy as compared to the other derivatives.

Conclusion: Folic acid and the two derivatives have a huge potential to be developed as the targeting agent against the GAPDH receptor. Further study is currently on-going to evaluate the effectiveness of these molecules through ELISA study and subsequently on the *Mycobacterium* itself.

Keywords: GAPDH, Glyceraldehyde-3-Phosphate Dehydrogenase, AutoDock, folic acid, antituberculosis, drug delivery

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PT-17

Development and characterization of coenzyme Q10 nanostructured lipid carriers (NLCs) using tristearin and stearyl alcohol for dermal delivery

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Abstract

Background: Coenzyme Q10 is a lipophilic antioxidant, that is used as a skin antiaging. Due to high lipophilicity, coenzyme Q10 has poor penetration to the skin. The limitation was overcome by NLCs.

Methods: The NLCs of coenzyme Q10 were optimized using tristearin, and stearyl alcohol as solid lipid with different liquid lipid and concentration. The optimized NLCs were characterized by dynamic light scattering (DLS) for particle size, polydispersity index (PDI), zeta potential, differential scanning calorimetry (DSC) for thermal behavior, Fourier transform infrared spectroscopy (FT-IR) for drug-lipid interaction, scanning electron microscopy (SEM) for the particle shape, viscometer for viscosity, and pH meter for pH value. Entrapment efficiency, drug loading, and skin penetration in vivo through rat skin were evaluated also. The molecular docking in silico was conducted to understand the interaction between coenzyme Q10 and the lipids.

Results: The NLCs of coenzyme Q10 using tristearin and stearyl alcohol with isopropyl palmitate as lipid matrix possessed particle size, polydispersity index (PDI), zeta potential, crystallinity index, and pH were < 1000 nm, < 0,5, < -30 mV, about 41 %, and about 6, respectively. The entrapment efficiency, drug loading, and viscosity of the NLCs using tristearin were higher than stearyl alcohol, but the depth of skin penetration of both NLCs was no different. The binding energy in silico of the NLC using tristearin lower than stearyl alcohol, and shown hydrophobic and van der Waals interaction.

Conclusion: The NLCs Coenzyme Q10 could be formulated using tristearin and stearyl alcohol for dermal delivery.

Keywords: *Coenzyme Q10, NLC, tristearin, stearyl alcohol, dermal delivery*

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PT-18

Optimization of Glyceryl Polyacrylate in Nanoemulgel of Mangosteen (*Garcinia mangostana* L.) Rind Fraction and Penetration Test of Preparations

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Abstract

Background: The mangosteen rind fraction positively contains flavonoids and polyphenols which can function as an anti-inflammatory. The use of mangosteen rind fraction in topical preparations requires a good delivery system to support percutaneous penetration, one of which is nanoemulsion. The topical use of nanoemulsion has low viscosity, therefore it needs to be formulated into nanoemulgel preparations. In formulating nanoemulgel preparations, the optimum concentration of gelling agents is needed to obtain a nanoemulgel that meets the physical and chemical characteristics of the gel preparation. Therefore we need an optimization of glyceryl polyacrylate gelling agent in order to obtain a nanoemulgel with good characteristics.

Methods: Nanoemulgel for mangosteen rind fraction was made in four formulas with gelling agent concentrations of glyceryl polyacrylate as much as 1% (F1), 2% (F2), 3% (F3), and 4% (F4). The nanoemulgel has been evaluated for its physical and chemical characteristics including organoleptic test, homogeneity, adhesion, viscosity, dispersibility, and pH. The active substance release test is carried out on a gel that meets the overall requirements for physical and chemical properties.

Results: The analysis showed that the F1 formula produced a nanoemulgel that met the physical and chemical characteristics of the semisolid preparations. The results of the release of active substances showed that the F1 formula was able to release 49.9% of active substances in 10 minutes and within 480 minutes was able to release 96.54% of active substances with a total flux of 5.36 $\mu\text{g} / \text{cm}^2\text{minutes}$.

Conclusion: Based on these results, it can be concluded that glyceryl polyacrylate with a concentration of 1% can produce good nanoemulgel.

Keywords: *Mangosteen, Glyceryl polyacrylate, Nanoemulgel, Nanoemulsion, Release Test*

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PT-19

The effect of aloe vera and propylene glycol concentration on physical characteristics of chitosan-aloe vera film as wound dressing

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Abstract

Background: Film as wound dressing has benefit such as can act as a barrier against bacterial penetration into the wound environment, improved patient compliance with its simple application, elastic and flexible. Combination of chitosan and Aloe vera improve the effectiveness of wound healing with antibacterial and anti-inflammatory effects. The addition of plasticizers to the film material can improve the functional properties of the film by increasing extensibility, flexibility and elasticity. The objective of this study was to determine the effect of Aloe vera concentration and plasticizer (propylene glycol) concentration to the physical characteristics of chitosan-Aloe vera film as wound dressing.

Methods: This research is a laboratory experimental study with a factorial design. There is 9 formulas with different combination of Aloe vera (0.5%;1%;1.5%) and propylene glycol (8%;10%;12%).

Results: The result showed that the addition of Aloe vera concentration affected film thickness, moisture content, and swelling index. The addition of propylene glycol concentration affected film thickness, pH, moisture content, and swelling index.

Conclusion: The statistical analysis indicated that there was interaction between Aloe vera and propylene glycol concentration that affected film thickness, pH, moisture content and swelling index.

Keywords: *chitosan, aloe vera, plasticizer, film, wound dressing*

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PT-20

Recent Advancement in Novel Pulsatile Drug Delivery System

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Abstract

Background: Pulsatile drug delivery systems (PDDS) have attracted attraction because of their multiple benefits over conventional dosage forms. They deliver the drug at the right time, at the right site of action and in the right amount, which provides more benefit than conventional dosages and increased patient compliance. These systems are designed according to the circadian rhythm of the body, and the drug is released rapidly and completely as a pulse after a lag time. These products follow the sigmoid release profile characterized by a time period. These systems are beneficial for drugs with chronopharmacological behavior, where nocturnal dosing is required, and for drugs that show the first-pass effect.

Methods: This review covers methods and marketed technologies that have been developed to achieve pulsatile delivery.

Results: Marketed technologies, such as PulsincapTM, Diffucaps[®], CODAS[®], OROS[®] and PULSYSTM, follow the above mechanism to render a sigmoidal drug release profile. Diseases wherein PDDS are promising include asthma, peptic ulcers, cardiovascular ailments, arthritis and attention deficit syndrome in children and hypercholesterolemia.

Conclusion: Pulsatile drug delivery systems have the potential to bring new developments in the therapy of many diseases.

Keywords: *Pulsatile, Drug delivery, Marketed technologies*

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PT-21

Formulation and Stability Test for Forskolin Microemulsion

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Abstract

Background: Forskolin is a secondary metabolite of the terpene group that can activate adipose cyclase. Adenylate cyclase plays a role in the formation of cAMP which is required for lipolysis of adipose tissue. Forskolin has a low solubility in water, so a delivery system is needed to increase its solubility when formulated in a transdermal dosage form. Microemulsion is a delivery system that can increase the solubility and stability of an active ingredient. Microemulsions provide clear visuals and are thermodynamically stable. The microemulsion components consist of oil, surfactants, cosurfactants and water which are formed spontaneously.

Methods: The selection of microemulsion components was made based on the solubility value of forskolin in several oils, surfactants and cosurfactants. Forskolin is formulated in the form of a microemulsion based on the manufacture of ternary diagrams carried out at Smix 1:1, 2:1 and 3:1 ratios. The stability of the microemulsion was tested with storage test at room temperature for 30 days and the freeze thaw test for 6 cycles with parameters test namely droplet size, polydispersity index and pH. Forskolin solubility determination was determined using HPLC.

Result: Based on the solubility of forskolin, the selected microemulsion components were oleic acid and Maisine CC® as the oil phase and Tween 20 and propylene glycol as surfactants and cosurfactants, respectively. From the ternary diagram and the stability test, there were found that the microemulsion that could be formed using Smix had a surfactant : cosurfactant ratio of 2:1 and 3:1 and a concentration of 45%.

Conclusion: Forskolin can be formulated in microemulsion form, that is stable in the room temperature storage test for 1 month and the freeze thaw test for 6 cycles. The concentrations of oil and Smix that can be used to form microemulsions are 5% and 45%, respectively.

Keywords: *Forskolin, microemulsion, Smix ratio, stability test*

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PT-22

Formulation and characterization self-nanoemulsifying drug delivery system of *Eleutherine palmifolia*

(L.) Merr extract using miglyol 812 and virgin coconut oil (VCO) as the carrier oil

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Abstract

Background: *Eleutherine palmifolia* (*E. palmifolia*), also known as Dayak onion, is an indigenous plant of Kalimantan, Indonesia, used by the Dayak people to cure various diseases. *E. palmifolia* has the disadvantage of low solubility. Self-nanoemulsifying drug delivery system (SNEDDS) application will increase the solubility and bioavailability of *E. palmifolia*.

Methods: The formulation of SNEDDS *E. palmifolia* consists of oil, surfactant, and co-surfactant. The component in the SNEDDS *E. palmifolia* formula is determined based on optimization results.

Results: The determination results are shown with clarity, and there is no phase separation on SNEDDS containing the smallest surfactants. Forty optimized formula designs show the results of two formulas that meet predetermined specifications, namely formula A (miglyol 812:tween 80:PEG 400) with a ratio of 1:1:1 and formula E (miglyol 812:tween 80:propylene glycol) at ratio 1:3:1. The characteristics of the optimal formulation showed transmittance value of > 90%; pH of 5,10-5,20; viscosity of 2,21-14,51 cP; emulsification time of < 120 second; particle size of 24,71-136,77 nm.

Conclusion: The optimal formula of SNEDDS *E. palmifolia* uses miglyol 812 as oil, tween 80 as surfactants, and PEG 400 as co-surfactant at a component ratio of 1:1:1 (Formula A) and miglyol 812 as oil, tween 80 as surfactants, and propylene glycol as co-surfactant at a component ratio of 1:3:1 (Formula E).

Keywords: *SNEEDS*, *self-nanoemulsifying*, *characterization*, *formulation*, *Eleutherine palmifolia*

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PT-23

The Effect of Chitosan Type and Drug-Chitosan Ratio on Physical Characteristics and Release Profile of Ketoprofen Microparticles Prepared by Spray Drying

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Abstract

Background: Ketoprofen is nonsteroidal anti-inflammatory drugs (NSAIDs) has a short plasma half-life time of about 1.5- 4 hours and severe sideeffects in the gastrointestinal tracts (GIT) that involve irritation,ulceration, bleeding, and perforation. To minimize gastrointestinally irritation and to extend absorption of ketoprofen, microparticles have been developed using chitosan.

Methods: Microparticles were prepared by using ionic gelation methods with chitosan, which has two different viscosities i.e.19 cPs and 50 cPs, cross-linked with tripolyphosphate (TPP) followed with spray drying. The microparticles were made with different drug-chitosan ratio.

Results: The results showed that the microparticles had spherical shapes. An increasing amount of ketoprofen improved entrapment efficiency. Evaluation of drug release in simulated intestinal fluid (pH 6,8) showed that the microparticles had the slowest release rate compared with the ketoprofen. The release rate of microparticles with chitosan 19 Cps concentration was slower than microparticles with chitosan 50cPs.

Conclusion: From the result, it could be concluded that the chitosan microparticles could retard the drugrelease. Further chitosan viscosity and drug-polymer ratio affected the release rate of ketoprofen.

Keywords: *ketoprofen, chitosan, microparticle, spray drying, tripolyphosphate*

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PT-24

Strategies to improve the stability of solid dispersion drug products

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Abstract

Background: Oral route of administration is more preferable compared to other routes of administration due to ease of ingestion, convenience in storage, and non-invasive procedure. However, most new drug candidates are poorly water-soluble, which results in insufficient bioavailability via oral administration accordingly that the drug can be commercialized for public use. To overcome the solubility issue, amorphous solid dispersion (ASD) is one of the preferred methods to be applied in the drug formulation. It increases the solubility of the drug by altering the molecular architecture of crystalline drugs into an amorphous form. Nevertheless, ASD has a high tendency for crystallization either during storage or in its aqueous dispersion that negates the advantages of enhanced solubility.

Methods: Intense review of literature on the solid dispersion technique, polymers, manufacture methods using different databases like Google, Pubmed, and Sciencedirect.

Results: It is critical to identify approaches in term of formulation, polymers and manufacture methods to establishing a successful product for oral administration.

Conclusion: This review highlights some of important aspects of amorphous solid dispersion such as a strategy to overcome physical instability to provide more pharmaceutical product prepared by solid dispersion technique.

Keywords: *solid dispersion, solubility, stability, polymer, manufacture*

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PT-25

Investigation of the Effect of *Chromolaena Odorata* Extract and its Formulations on HDFa Cells in Terms of Skin Photoaging

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Abstract

Background: This study includes the formulation and characterization of four topical formulations containing *Chromolaena Odorata* (CO) extract to ameliorate skin aging.

Methods: Liposomes, transfersomes, ethosomes and lecithin organogels (LO) were all formulated and characterized for particle size, zeta potential and pH. The effect of CO extract and the formulations against ultraviolet B (UVB) irradiation-induced photoaging in human dermal fibroblasts (HDFs) was investigated. Cell viability, matrix metalloproteinase I (MMP-1), total soluble collagen and reactive oxygen species (ROS) assays were performed.

Results: The mean particle size of CO loaded liposomes showed the smallest size of 281.77 ± 6.33 nm. The zeta potential of the formulations was found to be in the range of -88.7 ± 8.70 to -27.07 ± 0.86 mV. The pH of all the formulations was found to be in the range of 6.8 to 7.4. The safe range of CO extract on HDFa cell viability was 12.5 to 50 $\mu\text{g}/\text{mL}$. All the formulations did not show any toxicity toward HDFa; except CO loaded liposomes. None of the treatments showed significant difference in total soluble collagen secreted by HDFa without previous UV exposure. Pre-treatment with CO extract, CO loaded transfersomes 0.1 v/v % and CO loaded ethosomes 0.1 v/v %, followed by UVB exposure, improves cell viability, remains collagen amount and reduces the ROS and MMP-1 levels significantly.

Conclusion: According to the results, CO loaded transfersomes and CO loaded ethosomes are suggested to have the potential to be utilised as a promising photo protective agent to ameliorate skin aging.

Key words: *Chromolaena odorata*, anti-aging, photoaging

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PT-26

Emerging Immunomodulation Technologies may Potential Improve the Clinical and Pharmaceutical Health Care

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Abstract

The innovative immunomodulation technologies are excellent tools to synthesis the novel antibodies. The conventional methods are potentially replaced by more précised techniques to obtain the desired antibodies. Particularly the hybridoma technique used to produce the antibodies against targeted antigens. Moreover, the abundant powerful toxic substances can be handled with such monoclonal antibodies. These analytical acculturated or chimeric murine antibodies have a couple of imperatives and complexities. In order to vanquish these problems, late advancements in inherited building procedures and phage indicate framework have conceded the making of exceedingly recombinant antibodies that are specific. The antibodies chase for novel remedial medications outfitted with upgraded immune protective capacities such as drawing in invulnerable effector capacities, viable advancement of combination proteins, productive tumor tissue infiltration and high- partiality antibodies coordinated against targets. Propelled neutralizer building systems have broad practices in the fields of diagnostics, biotechnology, immunology, and helpful prescriptions. Consequently, our ability to comprehend the customary polyclonal and monoclonal antibodies and advanced immunizer designing strategies has widened the clinical use imaginative counter acting agents. This review has widely depicted advances in immunomodulation and neutralizer planning frameworks, assembled antibodies, demonstrate improvements in health and services of antibodies to human

Keywords: *Immunomodulation, Antibody-dependent cell-mediated cytotoxicity, Monoclonal antibodies, Polyclonal antibodies, Heathier future*

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PT-27

Effect of Rosemary Oil on Characteristics and Physical Stability of Ubiquinone- Nanostructured Lipid Carrier System

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Abstract

Background: Rosemary oil (RO) as an enhancer added in nanostructured lipid carrier (NLC) to increase ubiquinone penetration. The addition of RO which is a liquid oil influenced the characteristics and physical stability of the NLC system due to changes in the lipid composition of the NLC. The aim of these studies determined the effect of RO on the characteristics and physical stability of NLC-ubiquinone.

Methods: RO used in a different concentrations, 0% (F1); 1.0% (F2); and 2.0% (F3) in NLC-Ubiquinone 1% (w/v). Then carried out observations of characteristics including; organoleptic, pH value, particle size, polydispersity index (PDI), and zeta potential. The stability test was carried out by the thermal cycle method (3 cycles, each cycle consisting of 48 hours at 40°C then transferred at 2-8°C for 48 hours), at a storage temperature of 20 ± 1°C, 65% RH and centrifugation method at a speed of 3500 rpm, 3 x 15 minutes. The data obtained were analyzed statistically using one-way ANOVA method; (P <0.05) and descriptively.

Results: All of the formulas was yellow with the color intensity decreasing as the RO concentration is added, because more ubiquinone was into the NLC matrix. F1 and F2 have a thick consistency, while F3 thinner. It is known that the pH values of F1, F2, and F3 are 6.34 ± 0.01; 6.43 ± 0.02; and 6.44 ± 0.01. The particle sizes of F1, F2, and F3 were 188.25 ± 13.22; 195.10 ± 9.90; and 300.60 ± 28.17 nm, respectively. PDI values for F1, F2 and F3 are 0.20 ± 0.03; 0.22 ± 0.04 and 0.37 ± 0.04, respectively. The zeta potentials of F1, F2, and F3 are -54,5333; -46,9000 and -43,9000 mV, respectively. Thermal cycle method stability test results; F1 and F3 separated from cycle 1, while F2 was stable until cycles 3. The results of the storage test were at 20 ± 1oC, RH 65%; F1 and F2 were stable for 30 days, while F3 separate on day 30. Results of centrifugation test; F1 and F2 were stable for 45 minutes, while F3 separate at 45 minutes.

Conclusion: The addition of 1% RO decreased the zeta potential and increased physical stability, while the addition of 2% RO increased the particle size and PDI, decreased the zeta potential and decreased the physical stability of NLC-Ubiquinone.

Keywords: *Nanostructured Lipid Carrier, Characteristics, Rosemary oil, Ubiquinone, Stability Physical*

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PT-28

Comparative pharmacognostical evaluation of different parts of *Chicorium intybus* a potential antidiabetic herb with its suitability for novel drug delivery system

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Abstract

Background: Bioavailability enhancement is a key factor for making phytoconstituents more potent. Due to the complex nature large molecular size and poor membrane permeability and solubility limits the bioavailability of these compounds. Phytoconstituents and their suitability for development of a novel drug delivery system like herbosome, liposome etc. has gained popularity due their safety and other profiles.

Methods: Present study covered pharmacognostical evaluation of *Chicorium intybus* plant parts used in diabetes, gastric trouble, stimulant wound healing and hepatoprotection. Processed plant parts were subjected to various pharmacognostical studies like organoleptic, histology and power microscopic evaluation and various physical parameters such as ash values extractive values loss on drying moisture contents and fluorescence analysis were done and observations recorded.

Results: Study confirmed the suitability and selectivity of plant parts for extraction isolation and other screening. Leaves and root were containing maximum and minimum amount of extract respectively. Root contained maximum amount 5.32 % total ash. Leaves were containing moisture 11.56 % & 16.87 % LOD.

Conclusion: Study confirmed selectivity of plant parts, leaves and roots were of special concern. Further phytochemical and pharmacological screening with Herbosome development of the phytoconstituents of *Chicorium intybus* is in progress.

Keywords: *Bioavailability, Phytoconstituents, pharmacognostical*

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PT-29

VARIOUS CARRIERS STUDIES OF GENTAMICIN RELEASE FOR OSTEOMYELITIS THERAPY

Literature Review

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Background: Osteomyelitis is a progressive bone infection that can lead to tissue damage and bone necrosis. Since osteomyelitis therapy takes 4-6 weeks at a dose of 10 times the MIC value, it is necessary to have an appropriate carrier on the implant preparation to assist the release of gentamicin. This study aims to determine the release duration of gentamicin in PMMA carriers, calcium carbonate, calcium sulphate and bovine hydroxyapatite based on literature review.

Methods: The method in this research is a narrative review using the Scopus and Google Scholar with a time limit of 2005 to 2020. The inclusion criteria in this study are articles that use Indonesian and English, original articles (not review articles), full text available and test types. preclinics used in vitro.

Results: of this study showed that the release time of gentamicin in PMMA carriers was around 10 to 12 days. Calcium sulphate combined with nanohydroxyapatite containing gentamicin before and after implant hardening had a discharge of 28 and 10 days with a value of 100 times the MIC on the first day and 10 times the MIC thereafter. Meanwhile, the calcium carbonate in the Herafill-G implant released the gentamicin within 7 to 12 days. The duration of gentamicin release in combination bovine hydroxyapatite was 18 and 28 days with a value of 10 times the MIC.

Conclusion: Therefore, it can be concluded that the best release is in the combination of calcium sulphate and hydroxyapatite containing gentamicin before implant hardening and the combination of Bovine Hydroxyapatite, gelatine and glutaraldehyde because it is able to release gentamicin in about 28 days.

Keywords: *Gentamicin, PMMA, Bovine Hydroxyapatite, Calcium Sulphate, Calcium Carbonate, Osteomyelitis*

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PT-30

Fabrication and characterization of graphene oxide for photodynamic therapy application

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Abstract

Background: Graphene-based materials are of interest in many areas, including medical and pharmaceutical applications. The versatility of graphene has increased its potential to be used in the medical applications such as drug delivery. Among the useful form of graphene is the graphene oxide (GO). Methylene Blue (MB) is a photosensitizer that can eliminate cancer cells following exposure to light at a specific wavelength of 660 nm. This current project described the production and characterization of GO loaded with MB for photodynamic therapy application.

Methods: GO is commonly produced from graphite through a general method called the Hummer's method. MB was then loaded onto GO through self-assembly method.

Results: The yield for GO was recorded as 105% (+- 31.59 s.d). The surface charge of GO was analysed and it was found to be negatively charged at -33.5 mV. Scanning electron microscope (SEM) analysis showed crumpled and random aggregates of the GO whilst the elemental EDX clearly showed the presence of carbon and oxygen in the GO (99% of the atomic composition in the material). Several concentrations of MB (0.05%, 0.075%, 0.1% and 0.5%) were loaded onto the GO and the results showed that the highest loading capacity was 93% when 0.05% MB loading concentration was used. The FTIR analysis of GO and GO-MB showed the difference in the peaks between the two materials, in which the appeal of the intensity of the peaks at 1598 cm⁻¹ and 1387 cm⁻¹ indicate the successful loading of MB onto the GO. Thermal analysis also showed an exothermic peak at 219°C, corresponding to the decomposition of the carbon in the GO structure.

Conclusion: Future study will include investigation on the effectiveness of the loaded GO-MB *in vitro* on MCF-7 breast cancer cells.

Keywords: *Graphene oxide, Methylene blue, Photodynamic therapy*

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PT-31

Variation Concentration Effect of Propylenglycol, Glycerin and Polyethylenglycol 400 to Physical Properties and Dissolution Rate of Loratadine Liquisolid Tablet

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Abstract

Background: Loratadine is a second generation of antihistamin which has poor water solubility. The aims of this study is to evaluate variation concentration effect of propylenglycol, glycerin and polyethylenglycol 400 as nonvolatile solvent to physical properties and dissolution rate of loratadine liquisolid tablet.

Methods: Tablet was formulated into 9 formulas with concentration propylenglycol, glycerin and polyethylenglycol used are 30 mg, 40 mg and 50 mg. The mixture was evaluated flow properties and compressibility index. Tablet was evaluated hardness, friability, disintegration time and dissolution. Data was evaluated with SPSS program.

Results: The result showed that flow properties, disintegration time and dissolution for all concentration solvent, compressibility index at 30 mg solvent concentration and tablet hardness at 50 mg solvent concentration have significant value less than 0.05. Tablet friability for all concentration solvent, tablet hardness at 30 mg and 40 mg solvent concentration and compressibility index at 40 mg and 50 mg solvent concentration have significant value more than 0.05

Conclusion: There's difference flow properties, disintegration time and dissolution for all concentration solvent, compressibility index at solvent concentration 30 mg and tablet hardness at 50 mg solvent concentration. But there's no difference in tablet friability for all solvent concentration. There's no difference tablet hardness at 30 mg and 40 mg solvent concentration. And there's no difference compressibility index at 40 mg and 50 mg solvent concentration

Keywords: *loratadine, liquisolid, dissolution*

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PT-32

Preformulation cream from extract of red pidada leaves (*sonneratia caseolaris* L.) as a sunscreen

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Abstract

Background: Exposure to intense and prolonged solar ultraviolet rays can cause erythema, premature aging, and skin cancer. The prevention of ultraviolet rays can be done by using sunscreen. Red Pidada leaves (*Sonneratia caseolaris* L.) have properties as sunscreen. The purpose of this study was to preformulate red Pidada leaves into sunscreen cream preparations with the best activity as a cosmetic product prototype.

Methods: This research was started from making red pidada leaves ethanol extract formulated into a cream preparation with the extract concentration of Formula 1 (8%), Formula 2 (15%), and Formula 3 (20%). Evaluation of cream preparations includes organoleptic test, pH test, homogeneity test, dispersion test, adhesion test, viscosity, and sunscreen effectiveness test. Data analysis used the One Way Anova test.

Results: The results of the physical quality test of cream showed that Formula 1 (8%) and Formula 2 (15%) met the requirements of the organoleptic test, homogeneity test, and adhesion test but did not meet the pH test, viscosity test, and spreadability test. Formula 3 (20%) fulfills the organoleptic test requirements and adhesion test requirements but does not meet the homogeneity test, pH test, viscosity test, and spreadability test. The sunscreen effectiveness test in formula 1 has the lowest Sun Protection Factor (SPF) value of 1.5 (without protection), formula 2 has an SPF value of 2.9 (minimal protection), and formula 3 has the highest SPF value of 7.4 (protection extra).

Conclusion: The cream in formula 3 has a better sunscreen function than formula 1 and 2.

Keywords: *Sonneratia caseolaris* L, cream, sunscreen, sun protection factor (SPF)

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PT-33

Profile of Compressive Strength And Degradation Rate of Implant With Bio ceramic-Polymer Composite For Osteomyelitis Literature Review

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Abstract

Background: Bioceramic-polymer composites are biodegradable and often used as bone implant. Aspects of biocompatibility, biodegradability and mechanical strength is very important in order to meet the clinical suitability of the use of bone implant biomaterials. This literature review research aims to compare the profiles of the compressive strength and degradation properties of implants with various bioceramic-polymer composites.

Methods: Literature searching were carried out on databases, such as Google Scholar, Unair Repository, and Researchgate. The inclusion criteria included original articles published from 1999 until 2020 with English or Indonesian languages that provided data on the value of compressive strength and/or degradation rate of bioceramic-polymer composites.

Results: Twenty eight articles that meet inclusion criteria were reviewed. It was found that the use of bioceramic-polymer composites which is able to produce the best compressive strength value among several other bioceramic-polymer composites is Bioactive glass-CHT/GEL with compressive strength of cortical bones around 203-374 MPa. Meanwhile, bioceramic-polymer composites that are able to produce long time degradation are HAp-PLLA and β -TCP-Poly (L-Lactide-co- ϵ -Caprolactone) with degradation time almost one year (52 weeks).

Conclusion: The differences in the results of the composite compressive strength values are caused by several factors, *i. e* type and composition of the bioceramic-polymer used, preparation method during drying, and use of cross-linking agents. Meanwhile, factors that can affect differences in the degradation time of the composites *i. e* type and composition of the bioceramic-polymer used and use of cross-linking agents.

Keywords: *bioceramic-polymer composite, osteomyelitis, compressive strength, degradation rate*

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PT-34

Laser activation for penetration of turmeric extract cream (*Curcuma longa*) into rat skin tissue (Wistar strain)

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Abstract

Background: This study aims at laser activation for penetration of turmeric extract cream on rat skin tissue. The lasers used are varied in wavelengths, including 523 nm, 661 nm, 649 nm, 403 nm and 979 nm. The lasers are similar to one another in terms of the energy density, respectively: 21.298 J/cm², 20.566 J/cm², 20.822 J/cm², 21.162 J/cm² and 20.572 J/cm². The cream is divided into a base cream and a turmeric extract cream, labeled with Rhodamin B using the *fluoromicrograph* method.

Method: Data collection is completed in 4 treatments. The first treatment includes giving the rat skin the base cream, and the second treatment includes giving the rat skin the turmeric extract cream. The third treatment includes exposing the rat skin which has been smeared with the base cream to 5 types of lasers. The fourth treatment includes exposing the rat skin which has been smeared with the turmeric extract cream to 5 types of lasers. Skin tissue preparation samples are analyzed by scoring.

Result: shows that the score for the use of base cream is 1 and for turmeric extract cream is 2. The score for the combination of base cream with laser exposure is 1, while for the combination of turmeric extract cream and laser exposure is 2. result is supported by statistical analysis, showing no difference between the groups with and without laser exposure.

Conclusion: The lasers do not affect the penetration of the turmeric extract cream into the rat skin tissue using the *fluoromicrograph* method.

Keywords: *Penetration, laser, turmeric extract, fluoromicrograph, rat skin tissue*

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PT-35

Optimization of emulgel tamanu oil (*Calophyllum inophyllum* L.) formula and testing its activities on skin wound healing

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Abstract:

Background: Tamanu oil was used as a wound cover medication. The presence of this potential underlying the need for tamanu oil was developed into a practical dosage form such as emulgel. In this study optimization of the formula was carried out to produce the appropriate emulgel characteristics and tested its activity on skin wound healing.

Methods: Formula optimization is done using D-Optimal method consisting 13 formula of HPMC and propylene glycol. Characterization with pH and viscosity and verified using one sample t-test. The optimal formula of emulgel is performed by the evaluation of physical properties including organoleptic, homogeneity, pH, viscosity, coverage, and adhesiveness during storage of 4 weeks. Tamanu oil was tested in vivo on the back skin of 24 the male white rat Wistar strain with 4 groups. Percentage of wound healing was calculated from the length of the wound, then analyzed using One-Way ANOVA.

Results: The optimal formula of emulgel has a desirability value of 0,787 consisting of 24.72% HPMC and 75.28% PG. The optimal formula characterization showed pH value 6.38; viscosity 498.33 dPas. The results of the analysis showed that emulgel tamanu oil observation results did not differ significantly. The analysis results showed during 4 weeks of storage there were significant differences (p-value <0.05) on viscosity and coverage while the pH and adhesion values were not significantly different (p-value >0.05).

Conclusion: In vivo test results indicated the optimal formula of emulgel has a healing effect on the wound (p-value <0.05) compared to the normal and negative control.

Keywords: *Calophyllum inophyllum* L, D-Optimal, nyamplung, tamanu oil, wound healing

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PT-36

Antioxidant activity test of tamanu oil and development of peel-off gel mask cosmetic with variation of polyvinyl alcohol concentration

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Abstract

Background: Tamanu oil has the potency to be used as cosmetics, because it contains various kinds of chemical compounds such as calophyllolide, squalene, ketone, xanthone, coumarin, flavonoids, and triterpenes and fatty acids like oleic acid, linoleic acid, stearic acid, and palmitic acid.

Methods: Antioxidant activity test would be carried out using the DPPH method and to formulate tamanu oil to be a peel-off gel mask with the variation of polyvinyl alcohol (PVA) of 11, 12, and 1%. Peel-off gel mask of tamanu oil was evaluated based on physical properties including organoleptic, homogeneity, pH, drying time, viscosity, adhesive ability, and dispersive power test for 4 weeks storage.

Results: Inhibition concentration 50 (IC₅₀) tamanu oil was 111,058 µg/mL. The three formulae of the peel-off gel mask of tamanu oil met the criteria of physical and chemical characteristics of parameters.

Conclusion: Tamanu oil had a moderate antioxidant activity and the PVA variation has no significant effect on pH however, a significant effect on viscosity, drying time, adhesive ability, and dispersive power.

Keywords: *antioxidant, Calophyllum inophyllum L, nyamplung, peel-off gel mask, Tamanu oil*

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PT-37

Local application of bisphosphonate cross-linked by glutaraldehyde on bovine hydroxyapatite - gelatin composite scaffold

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Abstract

Background: Bisphosphonates are widely used in the treatment of bone disorders characterized by osteoclast-mediated bone resorption such as Paget's disease, fibrous dysplasia, myeloma, bone metastase and osteoporosis. Alendronate is commonly used that effectively inhibiting bone resorption. The disadvantages of this class are their poor bioavailability and side effects on oral and intravenous application such as stomach irritation and osteonecrosis in jaw. Thus, local treatment of alendronate is needed in order to achieve high concentration of drug. Bovine hydroxyapatite-gelatin scaffold with alendronate was studied. Glutaraldehyde was used as cross linking agent, to increased the characteristics of this scaffold. The objectives of this study were to prepare and characterized scaffold of alendronate using hydroxyapatite-gelatin and cross-linked by glutaraldehyde.

Methods: Preparation of cross-linked bovine hydroxyapatite-gelatin and alendronate scaffold with different concentration of glutaraldehyde (0%, 0.5%, 0.75% and 1%). The scaffold were characterized for porosity, density, morphology (Scanning Electron Microscope (SEM)), compatibility (Fourier Transform Infra-Red spectroscopy (FTIR)), degradation, compressive strength (Autograph), and cytotoxicity (MTT assay).

Results: Bovine hydroxyapatite-gelatin scaffold cross-linked with glutaraldehyde showed longer alendronate release than without glutaraldehyde. As glutaraldehyde concentration increased, porosity also increased. Eventually, it reduced compressive strength. The FTIR confirmed the formation of covalent between gelatin and glutaraldehyde. In addition, the scaffold has a good safety by MTT assay.

Conclusion: The presence of glutaraldehyde on bovine hydroxyapatite-gelatin composite with bisphosphonates are safe and suitable candidate for scaffold as a carrier to control bisphosphonate.

Keywords: *bovine hydroxyapatite, gelatin, alendronate, cross-link, glutaraldehyde*

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