ICOOM 2021

THE 4th INTERNATIONAL CONFERENCE ON

ORAL MICROBIOLOGY & ORAL IMMUNOLOGY

6-8 SEPTEMBER 2021
(Monday-Wednesday)

zoom e-CONFERENCE

ABSTRACT BOOK

THEME

Adapting Oral Health Research & Clinical Practice during COVID-19 Pandemic

ORGANIZERS

Malaysian Society of Oral MICROBIOLOGISTS & Oral IMMUNOLOGISTS
Reg. No.: PPM-015-14-17072018

KULLIYYAH OF DENTISTRY

الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
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Garden of Knowledge and Virtue

Malaysian Society of

Oral MICROBIOLOGISTS
& Oral IMMUNOLOGISTS
Reg. No.: PPM-015-14-17072018

- A national, non-profit organization.
- A platform to exchange ideas on best practices of oral health.
- Dedicated to COVID-19 awareness for the public and professionals. Articles (newspapers, journals alike) written by MySOMOI members are available here | https://mysomoi.org/covid-19/

SCIENTIFIC is the Core Values of MySOMOI

Sincerity,
Commitment,
Innovation,
Empathy, **N**etworking, **T**rust, **I**ntegrity, **F**airness, **I**ntellectuality, and **C**reativity

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https://mysomoi.org/

PAST EVENTS:

- International Conferences, ICOMOI 2018, 2019, 2020
- MySOMOI Talks:
  - ✓ Responsible research to escape traps of predatory journals
  - ✓ COVID-19: Separating between misconceptions and truth
- Workshops:
  - ✓ Techniques on Immunology
  - ✓ Scientific Writing Workshop
- Immunology quizzes

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Support our MySOMOI, either as members, promoters or funders for our upcoming projects

- Visit our website for the latest info: https://mysomoi.org/
- Healthy oral, healthy smile!

MESSAGE FROM THE DEAN, KULLIYYAH OF DENTISTRY, IIUM

I am delighted to welcome you all from all over the world. Let me take this opportunity to welcome our outstanding speakers, the panel of judges, academicians, clinicians, all delegates and attendees. To everybody, Selamat Datang.

This morning, we began a very important day by kicking off the 4th International Conference on Oral Microbiology and Oral Immunology. As an academic, a dentist, and a scientist, I believe that the time is right for us to build a common platform for dentists, medical doctors, researchers, scientific experts, and industrialists to advance globally, changing the concept of the conference. The conference can hopefully be the venue for all participants to present their scientific discoveries and develop global networks and promote new and innovative development in the field of oral health.

The field of dentistry is constantly expanding, with great technological and medical advancements. Efficacious scientific research partnerships require the integration of applied and fundamental knowledge, which is essential for community oral health and wellness. The COVID-19 pandemic has undoubtedly impacted our society's health, but clinicians, dentists, and academics working together may assist produce a holistic development that eventually benefits the community.

This virtual conference aims to provide a forum for all participants to present their research findings intending to exchange ideas, broaden network connections, and increase knowledge. This session, I feel, will be instructive and fascinating, with plenary speakers from important worldwide and local institutions, invited speakers, as well as oral presentations from clinicians and researchers from all over the globe. I believe this session will significantly influence the future direction of oral health as a whole.

I want to thank the judges from various public and private institutions for participating in this conference. I wish all participants the best and hope that they will have a terrific scientific competition. I wish to congratulate the Organizing Committee of ICOMOI 2021 for their hard work and commitment in ensuring that this event takes place effectively. I would also like to express my sincere gratitude to all parties involved for their relentless effort to organize and successfully line up an exciting program. I wish you all the best and have a wonderful conference. Thank you.

Professor Dr. Zainul Ahmad Rajion
Dean
Kulliyyah of Dentistry
International Islamic University Malaysia

MESSAGE FROM THE PRESIDENT, MySOMOI

I am delighted to say a few words about the 4th International Conference on Microbiology and Oral Immunology (ICOMOI 2021), held by the MySOMOI in collaboration with the Kulliyyah of Dentistry, International Islamic University Malaysia. Let me extend a warm welcome to all of you and thank you for participating in the conference. The conference is designed to enable the exchange of information and the finding of innovative solutions that are linked to the overall well-being of public health.

In the past two years, the COVID-19 pandemic has undoubtedly impacted our society's health, but it is hoped that clinicians, dentists, and academics working together can assist build a holistic development that eventually benefits the community. In addition to the impact of COVID-19 on oral health papers presented at the conference, a wide range of themes related to health are covered at all levels of care. This year, the theme for the joint conference is "Adapting Oral Health Research & Clinical Practice During COVID-19 Pandemic". This e-Conference seeks to provide a venue for all delegates to present their research findings and exchange ideas, network, and expertise. Invited speakers worldwide will join plenary speakers from leading worldwide and local institutions to create a stimulating and educational session that will help shape the future of oral health. I am sure that a wide range of speakers will appeal to a wide diversity of participants, and will bring you a wealth of knowledge.

This outbreak has exposed the need for public health, public health specialists, and faults in the health systems in many countries. I encourage the participants to work together to achieve more remarkable results in health by building unique public health networks based on this conference. This conference is one of the leading conferences on oral health, and I am hoping that people would take full advantage of the opportunity to establish a new network to investigate better and resolve problems of the new millennium.

I am grateful to the honourable guests, judges, and speakers for their insightful recommendations for successfully executing the conference. I am glad to express my heartfelt gratitude to the authors and reviewers, as the program would not have been possible without your valuable and passionate participation. I congratulate the ICOMOI 2021 organizing committee for its hard work and commitment to ensure the success of this conference. I would also like to offer my heartfelt gratitude to all individuals and organizations who worked tirelessly to organize and successfully set up an exciting programme. I hope you have a good time and enjoy yourself at the conference. Thank you.

Professor Dr. Fathilah Binti Abdul Razak
Professor
Department of Oral & Craniofacial Sciences
Faculty of Dentistry
Universiti Malaya

MESSAGE FROM THE CHAIRMAN, 4th ICOMOI 2021

I am pleased to welcome all of you to the 4th International Conference on Oral Microbiology and Oral Immunology (ICOMOI) 2021. This year, the 4th ICOMOI 2021 conference is held in collaboration with the Department of Fundamental Dental and Medical Sciences (FDMS), Kulliyyah of Dentistry, International Islamic University Malaysia (IIUM) .

The theme for 4th ICOMOI 2021 is "Adapting Oral Health Research & Clinical Practice During COVID-19 Pandemic". I sincerely hope that this conference will serve as an excellent platform for the participants to keep up with the latest findings and scientific development to inspire responsible research for the nation even during the COVID-19 pandemic. I would like to thank our speakers from Malaysia, Indonesia, United Kingdom, Australia, Japan and Thailand for agreeing to share their perspectives in line with the theme for ICOMOI 2021.

I would like to acknowledge the support from Professor Dr Zainul Ahmad Rajion, the Dean, Kulliyyah of Dentistry, IIUM and Assistant Professor Dr Mohd Haidil Akmal Mahdan, the Head of FDMS Department, to this conference. I would like to end this welcome with a round of thanks to all committee members of the 4th ICOMOI 2021 who have made this conference a reality. Organizing a virtual conference has its challenge, and I am grateful for the support received from all members from various Kulliyyahs and Universities. I would also like to extend our gratitude to our sponsors for supporting ICOMOI 2021. I wish all of you an enjoyable conference. Thank you.

ASSISTANT PROFESSOR TS DR MOHD HAFIZ ARZMI
Chairman
4th ICOMOI 2021 *cum* Vice-President (Meetings and Events)

CONTENTS

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SPEAKERS' PROFILES

Plenary Speaker 1

Professor Dr Takayoshi Sakai

Chairman, Department of Oral-Facial Disorder, Osaka University Graduate School of Dentistry, Osaka, Japan

Bibliography: Prof. Dr Takayoshi Sakai obtained his dental degree at the Faculty of Dentistry, Tokushima University, Tokushima, Japan in 1991. He then worked as a Clinical and Research Fellow of Oral & Maxillo-facial Surgery in Osaka University Dental Hospital and Osaka Police Hospital, Japan in 1991-1998. He completed a PhD in Oral Surgery and Biology at Osaka University in 1999. He moved to NIDCR, NIH, USA in 2000 and established the research of salivary gland development and regeneration (*Nature* 2003). He returned to Osaka University, and achieved the highest-level Professorship in 2006. Currently, he embarks on oral biology research (*Science* 2010, *Nat Commun.* 2018). He is a chief editor of Oral Science International, and the President of International Confederation of Cleft Lip & Palate and Related Craniofacial Anomalies (ICCPCA), which will be conducted in 2025 at Kyoto, Japan. He has written over 100 peer-reviewed papers, and has been invited as a distinguished guest lecturer both internationally and nationally.

ACE2 EXPRESSION IN HUMAN SALIVARY GLAND AND NEW DEVELOPMENT OF ORAL CARE PRODUCT USING MA-T

Abstract: Angiotensin converting enzyme 2 (ACE2) is known as a receptor of SARS-CoV-2. The gene database indicated that ACE2 is expressed in the salivary glands as well as in the lungs, but no evidence has been reported in the past for the localization of the ACE2 protein in human salivary gland tissue. We discovered that ACE2 is markedly expressed in the ductal epithelium of human salivary glands. SARS-CoV-2 can directly infect the lungs and salivary glands. When a healthy young person is infected, SARS-CoV-2 is spread via saliva droplets from an asymptomatic or mildly ill patient, and the aftereffects are relatively few and recovery is fairly rapid. However, in the case of elderly people with respiratory diseases, when infected, they tend to aspire their own saliva and thus causing a potentially life-threatening respiratory infection. It was suggested that differences in oral function may cause worsening of symptoms. Therefore, in consideration of countermeasures against COVID-19, we have developed a new oral care product. MA-T uses epoch-making catalytic technology and attack only when there are viruses and bacteria. We would like to introduce this new infection control method at medical and nursing care sites of coronavirus.

Plenary Speaker 2

Professor Dr Kobkan Thongprasom

Oral Medicine Department, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand

Bibliography: Prof. Dr Kobkan Thongprasom obtained her dental degree at the Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand in 1977. After her studies at the Faculty of Dentistry, Chulalongkorn University, she completed a MSc. in Oral Medicine at the University College of London, Eastman Dental Institute, United Kingdom in 1988. She then returned to Chulalongkorn University and achieved the highest level Professorship in 2011. She is a member in the editorial boards and reviewers of many leading international medical and dentistry journals. She was also a Secretary General of the Royal College of Dental Surgeons of Thailand (RCDST) during 2007-2010 and a President of the board committee of Oral Diagnostic Science of RCDST during 2013-2016. She is currently an advisory editor of Journal Oral Diseases. She has contributed 7 textbooks in Oral Medicine and written over 70 peer -reviewed papers, and has been invited as a distinguished guest lecturer both internationally and nationally.

ORAL AUTOIMMUNE DISEASES, ORAL HEALTH AND LIFE

Abstract: Oral autoimmune diseases are chronic inflammatory disorders that can be seen on the skin and mucosa. Some of these lesions may precede skin lesions or systemic diseases. However, the oral presentations in these patients often overlap and a diagnosis cannot be made by clinical features alone. Therefore, immunodiagnostic investigations are required to differentiate between the different diseases. Some interesting Thai cases with oral autoimmune diseases that were challenging in their diagnosis, treatment, and management are presented. The details of oral autoimmune diseases in Thai patients, such as Pemphigus, Mucous membrane pemphigoid, Linear IgA disease, Lupus erythematosus, and uncommon lesions associated with autoimmune diseases are discussed. Importantly, early detection of these lesions can help clinicians to control the pain and oral hygiene in these patients. Moreover, dentists can play an important role in early diagnosis and updated knowledge can help to prevent the patients from developing a fatal autoimmune disease.

Plenary Speaker 3

Professor Dr Nicola Cirillo

Professor of Dental Medicine, Pathology, Pharmacology, Melbourne Dental School, Faculty of Medicine, Dentistry & Health Sciences, The University of Melbourne

Bibliography: Prof. Dr Nicola Cirillo is a clinician-scientist interested in oral cancer and autoimmune blistering diseases. He earned a PhD in oral immunopathology in 2007. After that, he began his clinical training in Oral Medicine in Italy (Naples, Florence, Palermo), USA (UCSF, San Francisco) and India (TATA Memorial Centre/ACTREC, Mumbai; and Regional Cancer Center, Trivandrum). He then joined the Dental School at the University of Bristol, England, as a Clinical Lecturer in Oral Medicine. In 2012, he worked as Associate Professor and Consultant in Oral Medicine at University of Dammam (KSA) before moving to the University of Melbourne in late 2012, where he currently hold the position of Professor of Dental Medicine, Pathology, Pharmacology. His scholarly activity was concerned with oral mucosal diseases and span laboratory-based, translational and clinical research with a focus on bench-to-bedside approach. He has authored over 100 publications in peer-reviewed international scientific journals, has written 2 books and various book chapters on autoimmune disease and cancer. He also committed to dissemination of science and technology in a broader sense, being the Editor-in-Chief and Editorial Board Member of scientific journals in the fields of dentistry, dermatology, biochemistry and immunology, as well as reviewer for more than 30 scientific journals and funding bodies.

COVID-19 AND SARS-COV-2 VACCINES: WHY IT MATTERS TO DENTISTS

Abstract: Despite vaccination campaigns have kicked off in developed countries, the spread of the new coronavirus (severe acute respiratory syndrome coronavirus 2, SARS-CoV-2) continues to pose serious health risks worldwide. Healthcare workers, including dentists, are at a “very high exposure risk”, therefore it is essential that dental teams are provided with evidence-based guidance to protect their health and that of patients during this pandemic. In this lecture, I succinctly review the evidence on how SARS-CoV-2 human-to-human transmission informs the selection of transmission-based precautions that can be implemented in a dental setting. Furthermore, I discuss my own work focusing on gustatory alteration as a symptom of COVID-19, diagnostic delay of head and neck cancer during the pandemic, and finally on orofacial adverse effects of COVID-19 vaccines, including Bell's palsy.

Plenary Speaker 4

Dr. Nihal Bandara

Lecturer in Oral Microbiology, University of Bristol, United Kingdom

Bibliography: Dr Nihal Bandara obtained his Bachelor of Dental Surgery (BDS Honours) degree at the University of Peradeniya, Sri Lanka and went on to complete a Ph.D. in oral microbiology at the University of Hong Kong. He subsequently completed post-doctoral fellowships in pharmaceutical microbiology and oral microbiology at the University of Texas at Austin, USA and The University of Queensland, Australia respectively. He is currently employed as a lecturer in oral microbiology at the University of Bristol. He has been researching on the microbial interactions and signalling (fungal-bacterial in particular) in polymicrobial biofilm infections and their impact on antimicrobial therapy. He has authored over 50 peer-reviewed research papers, book chapters and delivered invited speeches worldwide. He is keen to explore opportunities to widen the impact of his research through collaboration, translations and changing and implementing policies for the betterment of the population worldwide.

FUNGAL CO-INFECTIONS: THE HIDDEN KILLERS OF COVID-19 PANDEMIC

Abstract: Despite the successful rollout of vaccination programmes, the incidence of COVID-19 associated hospitalisation and subsequent co-infections remain a significant concern. The poor response of the COVID-19 patients co-infected with fungal/bacterial pathogens to disease management strategies have led to higher rates of morbidities and mortalities worldwide. Data are imaging on the increased incidence of invasive fungal infections such as aspergillosis, mucormycosis, candidiasis, and cryptococcosis in COVID-19 patients. The treatment of fungal infections is an ongoing challenge due to their increased dissemination behaviour, enhanced antimicrobial resistance (AMR) profiles, the lack of sensitive diagnostics and limited approved antifungal armamentarium. Therefore, the strategies to improve the diagnostic and management approaches of those infected, as well as increasing the awareness of the fungal co-infection in the healthcare setups and in the community is essential to help prevent severe illness and death from these infections in COVID-19 patients.

Plenary Speaker 5

Dr. David L. Moyes

Lecturer in Host-Microbiome Interactions, Centre for Host-Microbiome Interactions Mucosal & Salivary Biology Division, King's College London Dental Institute, United Kingdom

Bibliography: Dr David L. Moyes obtained his degree in Microbiology at the University of Birmingham. After completing his MSc study in Immunology at King's College London, he directly pursued his PhD at Imperial College London (now known as University of Oxford) in 2002. His career started as a Research Fellow at Mucosal and Salivary Biology Division, King's College London Dental Institute in 2007. He is currently working as a lecturer in Host-Microbiome Interactions, Centre for Host-Microbiome Interactions, Mucosal & Salivary Biology Division, King's College London Dental Institute and was funded by HEFCE until retirement. He is an active member of British Society of Medical Mycology and British Society of Immunology. He is also an editor for world-known journal, Virulence and BMC Microbiology, and has published numerous articles, research papers and reviews on microbiology and immunology since 2009.

CAN A BALANCED MICROBIOME IMPROVE HOST IMMUNITY?

Abstract: The last decades have seen a significant advance in our understanding of the human microbiome and its role in disease. In particular, there has been a wealth of studies that have identified notable changes in the microbiome associated with disease, including a loss of diversity of these communities and most notably, loss of individual genera/phyla. These ongoing studies are revealing that every surface of the human body is inextricably linked with their resident microbial communities, with alterations in these communities resulting in significant changes in health. To date, changes in the microbiome have been linked to inflammatory bowel diseases, inflammatory skin diseases, neurodegenerative conditions and cardiovascular disease. Although much of this work has been done exploring the role of bacteria in these events, there are an increasing number of studies which also implicate a role for the fungal community, or mycobiome in disease. As we have uncovered more information regarding the microbiome, it has become apparent that these microbial communities act as a reservoir of both genetic potential and metabolites which have significant impacts on human health. These impacts are as diverse as regulating susceptibility of the community to antimicrobial drugs, to changing the metabolic processes of the host and the subsequent immune functioning – a process termed immunometabolism. By driving changes in host physiology and immunity, the mechanisms by which our microbiome can impact on disease are becoming more apparent. These discoveries have led to further hypotheses that modulating these communities could lead to reversal of disease states. In doing so, the efficacy of probiotics, prebiotics and microbiome transplants have all begun to be explored, paving the way for a future involving personalised medical treatments that "farm" our microbiome.

Invited Speaker 1

Associate Professor Dr. Basma Ezzat Mustafa Al-Ahmad

Fundamental Dental Medical Science Department, Faculty of Dentistry, International Islamic University Malaysia

Bibliography: Assoc. Prof. Dr. Basma Ezzat Mustafa Al-Ahmad has PhD in Clinical Pharmacology, MSc. in Clinical Advance Laboratory Sciences and Bachelors in Pharmacy. She is the head of Basic Medical Sciences unit, and head of the Natural Product Research group in Faculty of Dentistry International Islamic University Malaysia. She started working there since 2008 in academic and research fields. She is doing her researches in the field of pharmacology, microbiology, immunology and different laboratory sciences in relation to oral health. In addition to several researches in the field of natural product, she has 25 years of experience in this field. During this period, she managed to publish 5 books in addition to 48 publications. She has been awarded the Certificate of Excellence in Research and Publication in 2019 at the kulliyyah level.

IMMUNOLOGICAL ASPECTS OF EXPERIMENTAL ORAL CANDIDIASIS

Abstract: The human oral cavity is a unique ecological niche, oral candidiasis is the final outcome of the vulnerability of the host as of the virulence of the invading organism, a major virulence factor of *Candida albicans* is its ability to adapt to different environments. The treatment of such mucosal infections and the elucidation of the disease is challenging. Experimentally induced oral candidiasis is useful to clarify the etiopathology of this condition, improve diagnosis, and search for new therapeutic designs. The rat model considered as one of the well proven models for observing oral candidal colonization and infection. When growing on a medical device or mucosal surface, *C. albicans* reside as communities embedded in a protective matrix, usually they resist the host defenses, which include depositing and incorporation of several proteins into the biofilm matrix. This will emphasize the role of the denture base materials in enhancing the colonization, proliferation of *C. albicans* and the inflammation of the palatal mucosa. Such studies consider as powerful tool in understanding the pathogenesis, host interactions, and the management of oral mucosal candidal infections.

Invited Speaker 2

Dr. Elizabeth Fitriana Sari

Senior Lecturer, Dentistry and Oral Health Department, La Trobe Rural Health School, Australia

Bibliography: Dr Elizabeth Fitriana Sari is an oral medicine specialist and a lecturer who is interested in oral cancer and curriculum construction in dentistry and oral health. She earned a PhD in Oral Medicine in 2020 from Melbourne Dental School, The University of Melbourne, Australia. She had been involved in academic teaching and research in Faculty of Dentistry, Universitas Padjadjaran, Indonesia, since 2003 until now. She taught oral medicine and pathology in Melbourne Dental School in 2016-2020. She joined as a Senior Lecturer in Dentistry and Oral Health, La Trobe University since January 2020 until now. She gained an Honorary Professor of Oral Medicine from Papua New Guinea Dental School in 2021. She served as a head of oral medicine specialist program in 2010-2015 (Indonesia). She was an author who published many publications in peer-reviewed international scientific journals. She was also a reviewer in multiple journals such as Journal of Oral Pathology and Medicine (JoPM), Journal of Dental, Jaw and Face Development and Science. She also delivered lectures as a keynote speaker in several international and national dental meeting. She also trained general dental practitioners of how to do an early oral cancer screening across Indonesia, especially in the rural regions.

ORAL CANCER IN SOUTH EAST ASIAN COUNTRIES: THE ACTUAL RISK FACTORS AND HOW TO PREVENT IT IN COVID-19 PANDEMIC TIME

Abstract: Oral cancer (OC) in Southeast Asian countries: The actual risk factors and how to prevent it in COVID-19 pandemic time. OC is considered as a public health problem that carries significant morbidity and mortality. The disease represents a group of conditions with a range of sites and varied aetiology. Some countries in The Southeast Asian still have insufficient data of epidemiology studies in relation with oral pre-malignant disorders (OPMD) or OC prevalence and their risk factors. It is also important to understand the knowledge of General Dental Practitioners (GDPs) in recognizing OC risk factors, early symptoms of OC, as well as in performing OC early screening. Without a comprehensive understanding of these factors, efforts to prevent, detect and manage this disease are likely to be ineffective in terms of outcomes and use of resources. There is an urgent need for primary prevention of OC programs in The Southeast Asian countries. The challenge to prevent OC now has grown bigger than ever in COVID-19 pandemic time as people are still unaware about its risk factors and the disease is placed at least prioritized.

Invited Speaker 3

Associate Professor Dr. Raja Azman Raja Awang

Head of Periodontics Unit, School of Dental Sciences, Health Campus, Universiti Sains Malaysia

Bibliography: Assoc. Prof. Dr Raja Azman Raja Awang is a periodontist and lecturer at the School of Dental Sciences, Universiti Sains Malaysia, where he has worked since 1999. He received his PhD in Periodontal Immunology from the University of Glasgow in 2014. He completed his specialist training in Periodontics (2004) and his first Degree in Dentistry (1997) at the Universiti Malaya. In addition to treating patients and teaching dentistry, his research interests include periodontal clinical studies and immunology, as well as dental biomaterials. He teaches periodontology to dentistry students at the undergraduate and graduate levels. He has published a number of internationally refereed research articles on periodontology and dental biomaterials. He is currently the Head of Periodontics unit at the School of Dental Sciences, USM. He served as President of the Malaysian Section of the International Association for Dental Research (IADR) (2018 - 2020), as well as Vice President of the Malaysian Society of Oral Microbiologists and Oral Immunologist (MySOMOI) (2018-2020). He also writes children's educational books for Dewan Bahasa & Pustaka.

COMBATING THE AGGRESSIVENESS OF DENTAL BIOFILM IN PERIODONTAL DISEASE: HAVE WE DONE ENOUGH PREVENTIVE RESEARCH?

Abstract: Since researchers discovered the role of the bacteria community in dental caries in the early nineteenth century, research on the role of dental biofilm in oral health has advanced. In the early 1950s, studies conducted by Waerhaug began to uncover evidence of a link between dental biofilm and the progression of periodontal disease, and preventing biofilm formation has resulted in disease elimination. Biofilm research on the periodontal disease has grown since then. However, the precise mechanism through which biofilm causes periodontal tissue injury is still unknown. There are still gaps in our understanding of microbiology, immunology and tissue reactions in periodontal health and disease. Studies on dental biofilm have failed to effectively inhibit biofilm formation or disrupt biofilm structure in order to stop prevent the establishment and progression of periodontal disease. Furthermore, the incidence of periodontal disease has remained unchanged. It is well understood that the most effective approach to preventing biofilm maturity and becoming aggressive to periodontal tissues is prevention. Oral health education, awareness, and painless biofilm removal procedures are among the most well-known prevention approaches in oral hygiene care, but they are not strategically incorporated into the oral hygiene care modality, especially in Malaysia. This presentation covers the current practice of prevention in oral health care and preventive research strategies to combat dental biofilm aggression in oral disease, particularly periodontal disease.

Workshop Trainer

Dr. Edre Bin Mohammad Aidid

Lecturer, Kulliyyah of Medicine, International Islamic University Malaysia

Bibliography: Dr Edre Bin Mohammad Aidid graduated from IIUM in 2011 (MBBS or Bachelor of Medicine & Bachelor of Surgery) and subsequently offered his services as house officer and medical officer in Ministry of Health Malaysia. He then pursued Master in Public Health and Doctorate in Public Health at Universiti Putra Malaysia. He completed his specialist training in 2018. He is a Public Health Medicine Specialist and epidemiologist. His career involves consultation on epidemiological studies, evidence-based medicine, biostatistics and Geographical Information System. He has vast experience in delivering talks and workshops in the fields mentioned. His scientific work includes "Systematic Review on Electromagnetic Field Risk towards Cancer Development" in 2016, "Meta-analysis on Effectiveness of Stool-based Testing for Colorectal Cancer" in 2018 and has completed consultancy meta-analyses work in the field of clinical orthopaedics in 2019. He is currently completing his FRGS research on *Streptococcus gallolyticus* detection in colorectal cancer patients. Currently, he is the head of COVID-19 Operation Room in IIUM Kuantan Campus but still continues his academic work and passion in research, including meta-analysis.

Prof. Dr Wan Himratul Aznita Wan Harun
Faculty of Dentistry
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Kuala Lumpur

Dr Ahmad Mahfuz Ghazali
Faculty of Industrial Sciences and Technology
Universiti Malaysia Pahang (UMP)
Gambang, Pahang

Day 2 (7th September 2021)
Session 1 Oral Presentation
11:00am-1:00pm

HONOURABLE JUDGES

Day 3 (8th September 2021)
Session 2 Oral Presentation
9:00am-10:30am

Assoc. Prof. Dr Ghasak Ghazi Faisal
Kulliyyah of Dentistry
International Islamic University Malaysia
Kuantan, Pahang

Assoc. Prof. Dr Pulikkotil Shaju Jacob
School of Dentistry
International Medical University
Bukit Jalil, Kuala Lumpur

Asst. Prof. Dr Izzuddin Ahmad Nadzirin
Kulliyyah of Allied Health Sciences
International Islamic University Malaysia
Kuantan, Pahang

Asst. Prof. Dr Nurina Febriyanti Ayuningtyas
Faculty of Dental Medicine
Universitas Airlangga
Surabaya, East Java, Indonesia

Day 3 (8th September 2021)
Session 3 Oral Presentation
11:00am-1:00pm

HONOURABLE JUDGES

Day 3 (8th September 2021)
Session 4 Oral Presentation
2:00pm-3:45pm

Asst. Prof. Dr Intan Azura Shahdan
Kulliyyah of Allied Health Sciences
International Islamic University Malaysia
Kuantan, Pahang

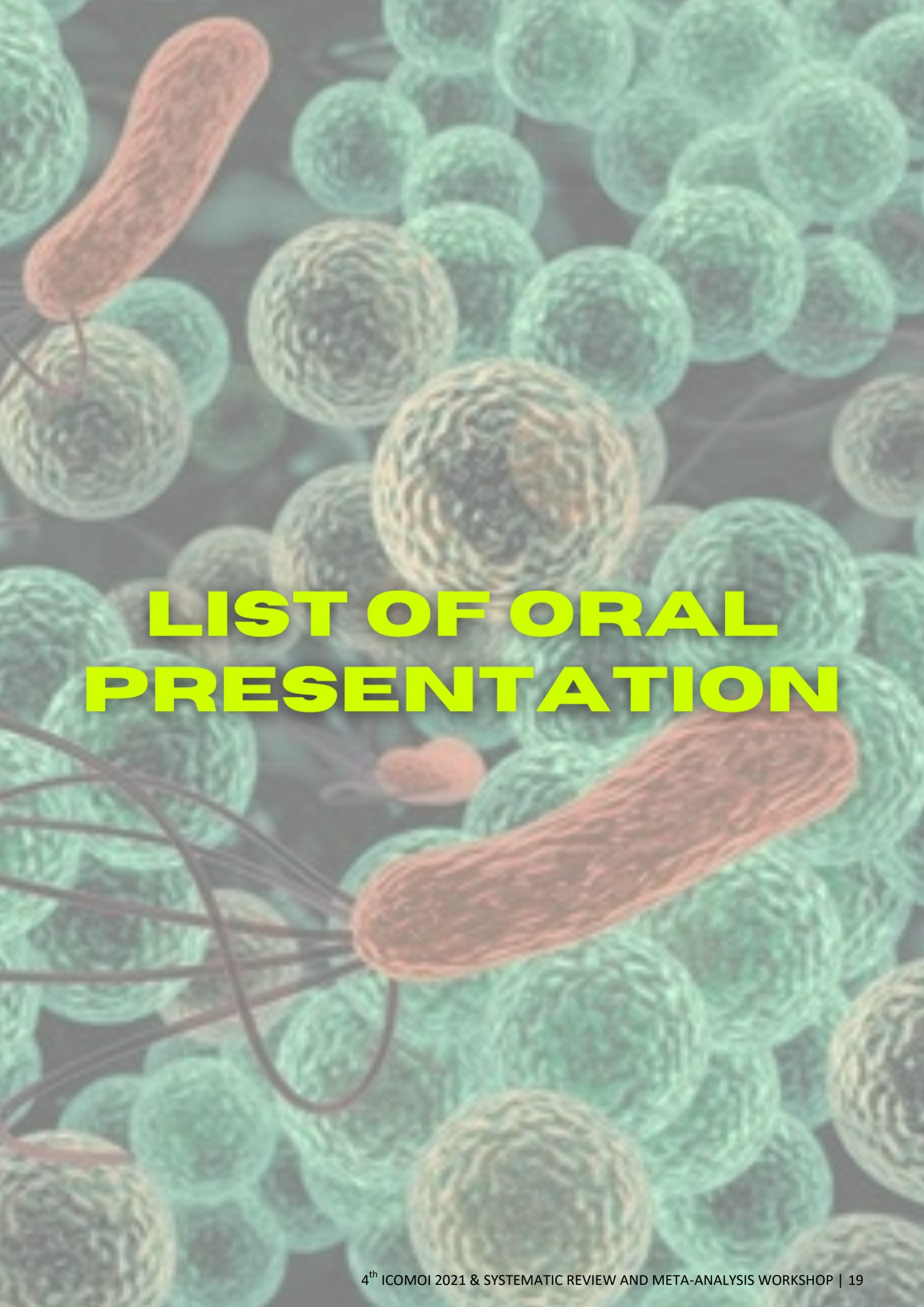
Assoc. Prof. Dr Thomas George Kallarakkal
Faculty of Dentistry
Universiti Malaya
Kuala Lumpur

FULL PROGRAMME

Day 1: 6th September 2021 (Monday)	
09:00 – 09:15	Opening remarks
09:15 – 11:30	**Workshop on Systematic Review**
11:45 – 12:45	**Workshop on Meta-analysis**
12:45 – 14:00	Break
14:30 – 17:00	**Hands-on: Systematic Review and Meta-analysis**

Day 2: 7th September 2021 (Tuesday)	
09:00 – 09:10	Participants arrival
09:10 – 09:20	Welcoming speech
09:20 – 09:30	Opening ceremony
09:30 – 10:15	**Plenary Lecture 1** Speaker: Prof. Dr. Takayoshi Sakai (Osaka University, Japan) Title: ACE2 Expression in Human Salivary Gland and New Development of Oral Care Product Using MA-T
10:15 – 11:00	**Plenary Lecture 2** Speaker: Prof. Dr. Kobkan Thongprasom (Chulalongkorn University, Thailand) Title: Oral Autoimmune Diseases, Oral Health and Life
11:00 – 13:00	**Oral Presentation (Session 1)**
13:00 – 14:00	Break
14:00 – 14:45	**Plenary Lecture 3** Speaker: Prof. Dr. Nicola Cirillo (The University of Melbourne, Australia) Title: COVID-19 and SARS-CoV-2 Vaccines: Why It Matters to Dentists?
14:45 – 15:15	**Plenary Lecture 4** Speaker: Dr. Nihal Bandara (Bristol University, United Kingdom) Title: Fungal Co-infections: The Hidden Killers of COVID-19 Pandemic
15:15 – 16:00	**Plenary Lecture 5** Speaker: Dr. David L. Moyes (King's College London, United Kingdom) Title: Can a Balanced Microbiome Improve Host Immunity?
16:00 – 17:00	**Immunology Quiz**

Day 3: 8th September 2021 (Wednesday)	
08:50 – 09:00	Participants arrival
09:00 – 10:30	**Oral Presentation (Session 2)**
10:30 – 11:00	**Invited Speaker 1** Speaker: Assoc. Prof. Dr. Basma Ezzat Mustafa Al-Ahmad (International Islamic University Malaysia, Malaysia) Title: Immunological Aspects of Experimental Oral Candidiasis
11:00 – 13:00	**Oral Presentation (Session 3)**
13:00 – 14:00	Break
14:00 – 15:45	**Oral Presentation (Session 4)**
15:45 – 16:15	**Invited Speaker 2** Speaker: Dr. Elizabeth Fitriana Sari (La Trobe University, Australia) Title: Oral Cancer in South East Asian Countries: The Actual Risk Factors and How to Prevent it in COVID-19 Pandemic Time
16:15 – 16:45	**Invited Speaker 3** Speaker: Assoc. Prof. Dr. Raja Azman Raja Awang (Universiti Sains Malaysia, Malaysia) Title: Combating the Aggressiveness of Dental Biofilm in Periodontal Disease: Have We Done Enough Preventive Research?
16:45 – 17:15	Declaration of winner and closing ceremony



LIST OF ORAL PRESENTATION

Day 2: 7th September 2021

Session 1 | Lab-Based Category

Time	ID No.	Name of Presenters	Title
11:00 - 11:15	ID-01	Maryam Riyadh Yaseen	Preparation of Tongkat Ali Root Extract Hydrogel for Wound Application
11:15 - 11:30	ID-03	Munirah binti Mokhtar	*Streptococcus salivarius* K12 regulates *Candida albicans* ECE1 Gene Expression
11:30 – 11:45	ID-05	Sama Naziyah Shaban	Wound Healing Activity of Flaxseed (*Linum usitatissimum*) Extract (Water and Ethanol) on Human Oral Fibroblast Cells (*In vitro*)
11:45 – 12:00	ID-06	Mak Siew Thong	Anti-biofilm activity of Three Endodontic Sealers
12:00 – 12:15	ID-07	Maheen Tariq	Intra-Subject Composition Analysis of the Oral Microbiota Associated with Pathogenesis of Periodontal Disease using 16S Metagenomics
12:15 – 12:30	ID-08	Aalina Sakiinah binti Mohd Fuad	The Effect of Synbiotic *Musa acuminata* and *Streptococcus salivarius* K12 on Oral Candidiasis: A Histological Examination
12:30 – 12:45	ID-09	Nora Azirah binti Mohd Zayi	Fabrication of Chitosan Loaded Metronidazole Nanoparticle for Periodontal Disease Treatment
12:45 – 13:00	ID-10	Puteri Elysa Alia binti Mohd Badri	Characterization of *Cervus timorensis* Velvet Antler and Its Effect on Biofilm Formation of *Candida* Species

Day 3: 8th September 2021

Session 2 | Lab-Based & Non-Lab-Based Category

Time	ID No.	Name of Presenters	Title
09:00 - 09:15	ID-12	Norfaezah binti Ahmad	Disinfection Protocols of Irreversible Hydrocolloid: Effect on *Candida* Total Cell Count and Dimensional Accuracy
09:15 - 09:30	ID-15	Engku Anis Fariha binti Engku Nasrullah Satiman	The Effect of Hygromycin B Quality towards *Candida albicans* Susceptibility
09:30 – 09:45	ID-22	Ida Bagus Pramana Putra Manuaba	The Elevated of Saliva, Serum, and Tissue Expression of TNF-α in Recurrent Aphthous Stomatitis: A Systematic Review
09:45 – 10:00	ID-23	Meircurius Dwi Condro Surboyo	The Histopathology and Immunohistochemistry Diagnosis of Pigmented Fungiform Papillae: A Systematic Review
10:00 – 10:15	ID-24	Ni Wy Rima Tiara Wahyudiana	Malnutrition Effect and Immunological Dysfunction in Oral Candidiasis: A Literature Study
10:15 – 10:30	ID-25	Aini Rasidda binti Norazmi	The Prevalence of Non-*Albicans Candida* in Oral Squamous Cell Carcinoma: A Review

Day 3: 8th September 2021

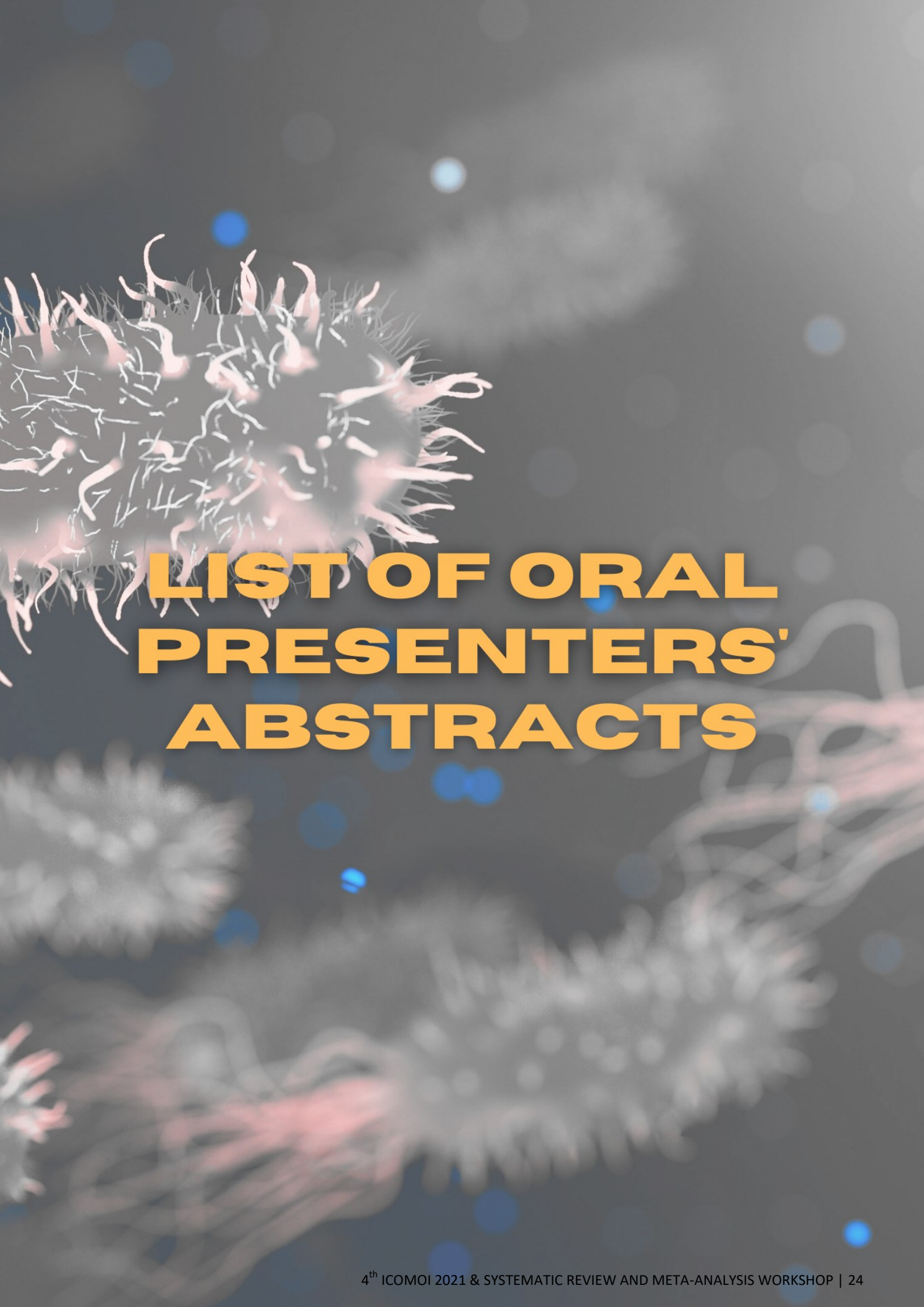
Session 3 | Lab-Based Category

Time	ID No.	Name of Presenters	Title
11:00 - 11:15	ID-11	Fazle Khuda	Quantification of Pro-Inflammatory Cytokines in the Gingival Tissue of Rats Following Orthodontic Wire Ligation and *Enterococcus faecalis* Inoculation
11:15 - 11:30	ID-14	Nastiti Faradilla Ramadhani	Exploration of Polymethylmethacrylate and Indonesian Natural Hydroxyapatite as Biomaterial Candidate Dental Implant
11:30 – 11:45	ID-16	Alexander Patera Nugraha	Inhibition Mechanism of Lipopolysaccharide-Induced Osteolysis After Gingival Mesenchymal Stem Cell's Conditioned Medium Transplantation
11:45 – 12:00	ID-17	Dessy Rachmawati	The Effectiveness of Robusta Coffee Bean Extract (*Coffea canephora)* in increasing Osteocalcin Expression in Mice Model Periodontitis installed with Nickel Titanium (NiTi) Wire
12:00 – 12:15	ID-20	Vivek Prasad	Evaluation of Rapid Test Kits for Detection of SARS-Cov-2-Specific Antibodies in Saliva
12:15 – 12:30	ID-28	Erlina Rachmawati	*COL1A1* and *FGFR2* Single Nucleotide Polymorphisms Found in Class II and Class III Skeletal Malocclusions in Javanese Population
12:30 – 12:45	ID-36	Nur Atmaliya binti Luchman	Osteogenic and Bone Regeneration Potencies of Dental Tissue-Derived Stem Cells Loaded in Hydroxyapatite and Polycaprolactone Scaffolds

Day 3: 8th September 2021

Session 4 | Non-Lab-Based Category

Time	ID No.	Name of Presenters	Title
14:00 – 14:15	ID-13	Fatma Yasmin Mahdani	Prevalence of Tongue Normal Variant Lesions in Geriatric Patients with Hypertension in Surabaya: A Multi-Center Observational Study
14:15 – 14:30	ID-26	Kurnia Hayati Rahman	The Role of the Immune and Endocrine Function in Patient Burning Mouth Syndrome with Moderate Depressive Episode Accompanied Gastro-Esophageal Reflux Disease: A Case Report
14:30 – 14:45	ID-27	Rosaline Novita Irianna Krimadi	The Challenge of Treating HIV/Aids Patients with Oropharyngeal Candidiasis During COVID-19 Pandemic in Surabaya, East Java
14:45 - 15:00	ID-29	Afryla Femilian	Mechanism of IgE-Mediated Immune Responses in Allergic Stomatitis and the Therapeutic Management: A Case Report
15:00 – 15:15	ID-30	Lani Berlina Talahatu	Stomatitis Induced by Allergic Reaction Against *Candida albicans*
15:15 – 15:30	ID-33	Maslah Siregar	Challenges in the Diagnosis of Chronic Traumatic Ulcer Resembling Oral Squamous Cell Carcinoma
15:30 – 15:45	ID-35	Ari Hapsari Tri Wardani	The Role of *Streptococcus viridans* in Secondary Infection of Sialolithiasis: A Case Report



LIST OF ORAL PRESENTERS' ABSTRACTS

PREPARATION OF TONGKAT ALI ROOT EXTRACT HYDROGEL FOR WOUND APPLICATION

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Abstract:

Background: Many patients worldwide suffer from different types of wounds. Although there are many available therapies for managing patients with chronic and acute wounds, these therapies are usually expensive and accompanied by undesirable side effects. Recently, plants have garnered remarkable attention as a source of therapeutic agents to treat wounds. This is because medicinal plants provide a rich reservoir of phytochemicals that could potentially become affordable and effective therapeutic agents. *Eurycoma longifolia* Jack or Tongkat Ali (TA), is one of the well-known traditional plants of Malaysia, it has been scientifically proven to have medicinal properties. Hydrogels are hydrophilic polymer networks that can imbibe a significant number of fluids. Compared to other systems developed for delivery of herbal medicines, a unique strength possessed by hydrogels is the high-water absorption capacity. This capacity has favoured the loading of herbal formulations, which are in general aqueous in nature, into hydrogels. Objective: The aim of this study is to prepare Tongkat Ali hydrogel for wound application. Methods: Authentication of *Eurycoma longifolia* Jack roots was done by microscopic examination using methylene blue and Lugol's iodine solution. Root extraction was performed by Soxhlet technique. *In vitro* cytotoxicity of ethanol extract of the roots was evaluated in human primary gingival fibroblasts cells and IC_{50} was determined. The ethanolic extract was loaded into hydrogel as a suitable dosage form for further wound healing studies. Results: The crude herbal drug sample, TA present the same microscopical characters to that of *Eurycoma longifolia* Jack tap root. IC_{50} was 118.5 µg/mL. The hydrogel was prepared using 2% xanthan gum and ethanol extract of TA was loaded successfully for its later application as a wound healing agent. Conclusion: TA root extract can be successfully formulated into a hydrogel for application on different types of wounds.

Keywords: *Eurycoma longifolia* Jack, microscopic examination, hydrogel

STREPTOCOCCUS SALIVARIUS K12 REGULATES *CANDIDA ALBICANS ECE1* GENE EXPRESSION

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Abstract:

Introduction: *Candida albicans* is known to be one of the aetiological factors for oral cancer. The yeast can produce candidalysin expressed by *ECE1* gene, a toxin that may involve in oral carcinogenesis. Meanwhile, *Streptococcus salivarius* K12 is an oral probiotic that is proven to be beneficial to oral health. Objective: This study aims to determine the effect of the polymicrobial interaction of probiotic *Streptococcus salivarius* K12 (K12) with *C. albicans* on *ECE1* gene expression. Methods: *C. albicans* ATCC MYA-4901 (normal oral isolate) and ALC3 (oral cancer isolate) were used in the study. RPMI-1640 medium was used to grow the biofilm. Monospecies and polymicrobial biofilms were developed for 72 hrs in a 96-well plate. The biofilms were incubated at 37 °C, aerobically. The medium was replenished every 24 h. Following that, the biofilms were scraped off prior to RNA extraction. The gene expression was carried out, and the result was normalised to β-actin. Results: K12 significantly increased *C. albicans ECE1* gene expression by 16-fold in oral cancer isolate *C. albicans.* However, no significant difference was observed in *C. albicans* isolated from the normal oral cavity ($P>0.05$). Conclusion: K12 increases *ECE1* gene expression in oral cancer isolates, suggesting that the probiotic may not suit oral cancer patients.

Keywords: probiotic, candidalysin, *ECE1*, *Candida albicans*

WOUND HEALING ACTIVITY OF FLAXSEED (*LINUM USITATISSIMUM*) EXTRACT (WATER AND ETHANOL) ON HUMAN ORAL FIBROBLAST CELLS (*IN VITRO*)

Sama Naziyah SHABAN[1], Khairani Idah MOKHTAR[2,] Solachuddin ICHWAN[2], Basma Ezzat Mustafa ALAHMAD[2]

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Abstract:

Flaxseed (*Linum usitatissimum*) plant has many health beneficial effects such as anti-microbial, anti-fungal and anti-cancer effects. In the current study, the wound healing activity of flaxseed (*Linum usitatissimum*) extract is being tested on oral fibroblast cell line. Flaxseed (*Linum usitatissimum*) is extracted using Soxhlet extraction method via two mediums water and ethanol to assess and compare the difference between the activities of both extracts; if present. After the extraction procedure, the extracts were tested for their biological activity using 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) assay to determine the safety and dosage of the extract to be administered onto the oral fibroblast cells. Then, the wound healing assay is carried out to test the activity of both water and ethanol flaxseed extract on oral fibroblast cells. The results revealed that both water and ethanol extract have high wound healing activity against oral fibroblast cell line where ethanolic extract shows slightly higher activity in healing on oral fibroblast wounds (*in vitro*). One-way ANNOVA was carried out with post-Hoc Turkey test where the *P* value of compared variables was found to be < 0.05 at 95% confidence interval. Based on the results obtained; it could be concluded, that flaxseed extract has a potential wound healing activity as the results shows high wound healing activity on oral fibroblast cell line.

Keywords: *Linum usitatissimum*, GC-MS, MTT

ANTIBIOFILM ACTIVITY OF THREE ENDODONTIC SEALERS

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Abstract:

Endodontic infections are mainly caused by biofilm. Endodontic sealers with antibiofilm properties have advantages to further eliminate the residual biofilm that resides in the root canal system after chemo-mechanical preparation. However, limited data on antibiofilm activity of endodontic sealers is available. Therefore, this study aims to investigate and compare the effectiveness of iRoot SP™, EndoSeal MTA™ and AH Plus™ against biofilm. The biofilm was prepared using subgingival plaque collected from a healthy individual. The plaque suspension was then inoculated in 8-well cell culture slides and incubated under anaerobic conditions at 37℃ for 2 days, 1 week, 2 weeks, 3 weeks, and 4 weeks, respectively. Subsequently, 0.5 mL of tested endodontic sealers were placed directly onto the biofilm for 1 hour, 1 day, 3 days, and 7 days. The number of dead and live bacteria was determined by using confocal laser scanning microscopy (CLSM). The collected data were analysed by one-way analysis of variance (ANOVA) and Tukey's post hoc test for multiple comparisons. The antibiofilm activity of all three endodontic sealers showed a similar efficacy to inactivate 40% to 50% of the bacteria cells within the biofilm structure. Nevertheless, EndoSeal MTA™ exhibited highest effectiveness against 2-day-old biofilm at each treatment time point as compared to iRoot SP™ and AH Plus™. In conclusion, all three endodontic sealers demonstrate similar antibiofilm activity regardless of biofilm age and treatment time. The EndoSeal MTA™ sealer has exhibited strongest antibiofilm activity when tested against younger biofilm.

Keywords: antibiofilm, bacteria, biofilm, endodontic sealers

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INTRA-SUBJECT COMPOSITION ANALYSIS OF THE ORAL MICROBIOTA ASSOCIATED WITH PATHOGENESIS OF PERIODONTAL DISEASE USING 16S METAGENOMICS

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Abstract:

Background: Periodontitis is a multifactorial inflammatory disease which involves complex interaction between oral microbiota and host immune response. Few studies are performed on healthy and diseased sites of the same subject. However, these studies are still limited. Objective: The study investigated the microbial profile in healthy and diseased sites of the same individual using 16S rRNA metagenomics. Methods: Dental plaque was taken from healthy and diseased sites of 16 periodontitis subject and DNA was extracted. The extracted DNA was sent to illumina lab for 16S RNA gene metagenomic sequencing and for determination of taxonomic classification. Results: The periodontitis site was found to have richer and even microbial community as compared to healthy sites. Moreover, the PCoA Analysis based on Weighted Unifrac distance showed that healthy and Periodontitis samples from same individual does not cluster together. In the taxonomic analysis, phylum Bacteroidetes, Firmicutes, Fusobacteria, and Proteobacteria were the most abundant microbiota in both sites. The statistically significant difference was observed between healthy and periodontitis group at phylum level for Synergistetes. At the species level, *Prevotella intermedia, Veillonella dispar, Rothia dentocariosa,* and *Porphyromonas endodontalis* were the most abundant microbiota in both sites. However, no statistically significant difference was observed at species level. Conclusion: The difference in microbial composition between healthy and periodontitis sites were observed. The potential pathogen in periodontitis sites in individual can be identified and thus shift from healthy site to periodontitis sites can be timely intervened.

Keywords: 16S metagenomics, dental plague, intra-subject, periodontitis

THE EFFECT OF SYNBIOTIC *MUSA ACUMINATA* AND *STREPTOCOCCUS SALIVARIUS* K12 ON ORAL CANDIDIASIS: A HISTOLOGICAL EXAMINATION

Aalina Sakiinah MOHD FUAD[1,2], Nurul Alia Risma RISMAYUDDIN[2], Nurul Syahindah FARIZUDDIN[5], Nurrul Shaqinah NASRUDDIN[4], Ridhwan ABDUL WAHAB[1], Mohd Hafiz ARZMI[2,3]

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Abstract:

Introduction: Mouthwash is used to prevent oral diseases, including oral candidiasis. Current chemical-based mouthwash such as alcohol, chlorhexidine and cetylpyridinium chloride can lead to dysbiosis. This study aimed to determine the effect of synbiotic *Musa acuminata* and *Streptococcus salivarius* K12 on oral candidiasis. Methods: *M. acuminata* skin aqueous extract was used in the study. *S. salivarius* K12 was grown and maintained on BHI agar. Twenty adult female Sprague Dawley rats were randomised into five groups (n=4). All groups, except the negative control group, were immunosuppressed with subcutaneous injection of 2 mg/kgbw of Dexamethasone on day-8 and maintained every three days, and 1% (w/v) of tetracycline daily in drinking water from day-1. Oral candidiasis was induced by oral inoculation of 0.1 mL of saline suspension containing $3x10^8$ viable cells of *C. albicans* three times from day-8 until day-12. The treatment groups received different concentration of *M. acuminata* (80 mg/mL and 800 mg/mL) mixed with 0.1 mL of 1×10^6 cells/mL of *S. salivarius* K12. The treatment-control group received 0.1 mL of 0.06% CHX-containing mouthwash. Negative control and no-treatment control groups received no treatment. Rats were euthanised after three days, the tongues were resected, fixed in formalin and undergone Haematoxylin and Eosin staining (5 µm thickness). Results: Macroscopic observation showed a reduction in inflammation on tongues treated with synbiotic. Histology depicts a major reduction in the presence of *C. albicans* on the tongues, depicted by less penetration into the basal membrane, decrease in inflammatory cells migration and reduced basal disorganisation on tongues treated with synbiotic compared to control groups. Conclusion: Our study has illustrated the potential of synbiotic as a treatment for oral candidiasis by reducing the fungal burden on the tongues compared to the current mouthwashes.

Keywords: *Candida albicans, Streptococcus salivarius* K12, *Musa acuminata*, synbiotic

FABRICATION OF CHITOSAN LOADED METRONIDAZOLE NANOPARTICLE FOR PERIODONTAL DISEASE TREATMENT

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Abstract:

Periodontal disease is a dental infection caused by bacteria that can progress to severe periodontitis, which destroys the connective and alveolar tissues and results in tooth loss. It affects the quality of life of 11.2% of adults worldwide, as well as socioeconomic and healthcare costs. Clinically, guided bone regeneration is used to repair an alveolar bone defect, which is then followed by antibacterial ointment. Metronidazole has been the antibiotic of choice in the treatment of severe periodontitis due to its broad-spectrum activity and efficacy against obligate anaerobes. However, because the administered dose did not sufficiently reach the therapeutic site, the number of follow-up visits has increased. Nanotechnology offers an alternative strategy to overcome drug deficiencies by releasing the drug at the targeted site for an extended period, improving penetration, and preventing drug side effects. In this study, chitosan-loaded metronidazole (CS-MN) nanoparticles were fabricated through the ionic gelation technique with crosslinking agents, sodium thiosulfate. The nanoparticles were analysed and characterized in terms of particle size, polydispersity index, zeta potential, and encapsulation efficiency. The results showed that the nanoparticles produced had a particle diameter of 308 nm, polydispersity index of 0.374, positive zeta potential >30mV, and encapsulation efficiency of 88%. In this study, a nanometre-sized drug with a monodisperse population, ideal zeta potential, and high encapsulated drug content of CS-MN nanoparticles were suitable to be use in nano-systems and local drug delivery in periodontal disease treatment. Further *in vitro* studies are required to analyse the drug's effectiveness and safety in periodontal bone regeneration.

Keywords: periodontitis, metronidazole, nanoparticle, local drug delivery

CHARACTERIZATION OF *CERVUS TIMORENSIS* VELVET ANTLER AND ITS EFFECT ON BIOFILM FORMATION OF *CANDIDA* SPECIES

Puteri Elysa Alia MOHD BADRI[1,3], Nurul Alia Risma RISMAYUDDIN[1], Nozaiti MOHD KENALI[1,4], Deny Susanti DARNIS[5], Mohd Hafiz ARZMI[1,2]

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4. Department of Paediatric Dentistry and Dental Public Health, Kulliyyah of Dentistry, International Islamic University Malaysia, Kuantan, Pahang, Malaysia
5. Department of Chemistry, Kulliyyah of Science, International Islamic University Malaysia, Kuantan, Pahang, Malaysia

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Abstract:

Objectives: To characterize deer velvet antler (DVA) extract and to determine its effect on biofilm formation of *Candida* species. Design: Liquid-Chromatography-Quadrupole-Time of Flight (LC-Q-TOF-MS) was conducted to characterize the secondary metabolites of DVA extract. *Candida albicans* ATCC MYA-4901 (ALT5), AIDS isolate (ALC2), oral cancer isolate (ALC3), *Candida dublieniesis* ATCC MYA-2975 (CD), *Candida glabrata* ATCC 90030 (CG), *Candida krusei* 14243 (CK), *Candida lusitaniae* ATCC 34449 (CL), *Candida parapsilosis* ATCC 22019 (CP) and *Candida tropicalis* ATCC 13803 (CT) were used in the biofilm study. To determine the monospecies of *Candida* biofilm, 200 µL of RPMI-1640 containing $3x10^4$ of *Candida* cells were pipetted into the same well of a 96-well plate. To determine the polymicrobial biofilm formation by *Candida,* 200 µL of RPMI-1640 containing 3×10^4 of *Candida* cells and 40 mg of DVA extract were inoculated in the same well. Wells that only consisted of *Candida* cells served as the negative control. The biofilms were incubated at 37 °C for 72 hours. Finally, a crystal violet (CV) assay was used to quantify biofilm formation and *Candida* total cell count was enumerated. Results: A total of 46 compounds were detected in the DVA extract. CL exhibited a high percentage of biofilm biomass reduction when treated with DVA extract (66.10), followed by ALC3 (44.12). Besides, *Candida* exhibited a decrease in total cell count when treated with DVA, except for ALC3 and CK. CG and CP had a similar total cell count when cultured with DVA with 1.17×10^5 cells/mL, while ALT5 had the lowest total cell count when cultured with DVA extract with 0.17×10^5 cells/mL. Conclusion: All *Candida* species inhibit biofilm formation when cultured with DVA extract except for CG, CK, and CP.

Keywords: deer velvet antler (DVA), *Cervus timorensis*, *Candida* species, biofilm

QUANTIFICATION OF PROINFLAMMATORY CYTOKINES IN THE GINGIVAL TISSUE OF RATS FOLLOWING ORTHODONTIC WIRE LIGATION AND *ENTEROCOCCUS FAECALIS* INOCULATION

Fazle KHUDA[1], Badiah BAHARIN[1], Nur Najmi MOHAMAD ANUAR[2], Nurrul Shaqinah NASRUDDIN[1]

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Abstract:

Enterococcus faecalis is a Gram-positive, facultative microorganism and not among commensal oral microbiota. It enters the oral cavity through food contaminant or nosocomial infection and associated with the oral microbiota. Elevation of the proinflammatory cytokines levels in response to microbial challenge is an important hallmark of initiation periodontal inflammatory process. The aim of this study is to evaluate the proinflammatory cytokines expression levels following concurrent *E. faecalis* inoculation and orthodontic wire ligation. Twelve rats were divided equally into 3 groups; 0-day, 7-day and 14-day of induction with 0-day group served as negative control group. 0.2mm sterile orthodontic wire inserted into the inter dental space of maxillary right 1st and 2nd molar and 0.5 µl of 1.5x10^{8} CFU/ml *E. faecalis* suspension was injected into the gingival sulcus at the similar area. Gingival tissue samples were collected from respective group after induction period for RNA extraction and cDNA conversion. The Real Time-PCR was carried out in 10µl reaction as instructed ChamQ Universal SYBER® qPCR master mix (Vanzyme, China). The two step amplification was performed for IL-1β, IL-6 and TNF-α in a thermocycler (Bio-Rad CFX96 Connect™ real-time PCR, USA) as follows: initial denaturation at 95℃, 30 sec; denaturation 95℃ 10 sec; annealing temperature 60℃ 30 sec; for 40 cycles. Result shows significant upregulation ($P<0.05$) of IL-1β, IL-6, TNF-α mRNA expression levels in the gingival tissue samples at 7-day and 14-day compare to control group. The study suggests acute inflammatory response within the gingival tissue in response to microbial challenge.

Keywords: periodontal disease, *E. faecalis*, proinflammatory cytokines

DISINFECTION PROTOCOLS OF IRREVERSIBLE HYDROCOLLOID: EFFECT ON *CANDIDA* TOTAL CELL COUNT AND DIMENSIONAL ACCURACY

Nur Dini AHMAD ZAWAWI[1], Nur Farah Athirah MUHAMMAD[1], Siti Hajjar NASIR[2], Mohd Hafiz ARZMI[3,] Norfaezah AHMAD[4]

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Abstract:

Introduction: Disinfection of impression is compulsory to prevent cross-infection to dental personnel. However, prolonged immersion in disinfectants may affect the dimensional accuracy of irreversible hydrocolloid. Different types of disinfectants are available nowadays, including alcohol-based, glutaraldehyde, and chlorine derivatives. Objectives: To investigate the effect of disinfection protocols on *Candida* total cell count and dimensional accuracy of irreversible hydrocolloid. Methods: For the antifungal activity part, 60 alginate beads were made and treated with different disinfection protocols (2% Aseptoprint, 1% sodium hypochlorite or 3% MD 520 for two minutes, one hour, six hours or 24 hours) except for control group. The beads were inoculated with *Candida albicans* (ATCC MYA 4901). Colony-forming units (CFUs) were counted using a haemocytometer and analysed using paired t-test. For dimensional accuracy assessment, alginate impressions were taken from a master cast and treated with the same disinfection protocols. Three linear measurements of the casts from impressions immersed in different disinfection protocols were compared to the master cast. Statistical analysis was determined using Friedman Test. Results: Significant reduction of *Candida* CFUs were observed after disinfection with 3% MD 520 and 2% Aseptoprint compared to the control ($P<0.05$). The dimensional changes of alginates treated for six and 24 hours were also found to be statistically significant ($P<0.05$). Discussion: 3% MD 520 and 2% Aseptoprint had effective antifungal activity on irreversible hydrocolloids impression. Dimensional changes of alginate were due to imbibition and syneresis, affecting the casts constructed. Longer immersion time yielded less fungal count but resulted in increased dimensional changes. Conclusion: 3% MD 520 and 2% Aseptoprint are recommended for irreversible hydrocolloid disinfection, with immersion time not exceeding one hour.

Keywords: infection control, irreversible hydrocolloid, antifungal, dimensional accuracy

PREVALENCE OF TONGUE NORMAL VARIANT LESIONS IN GERIATRIC PATIENTS WITH HYPERTENSION IN SURABAYA: A MULTI-CENTER OBSERVATIONAL STUDY

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Abstract

Introduction: Aging can cause structural and functional changes in systemic vasculature, resulting in a degenerative disease such as hypertension. Elderly who suffers from hypertension can develop oral mucosa abnormalities and most of them are found on the tongue. This study was aimed to identify the prevalence of normal variant lesions on the tongue in elderly with hypertension. Methods: This was an observational descriptive study with a cross-sectional design done in January-March 2020. Samples were elderly obtained from several public health centres in Surabaya. Subjective and clinical examination was performed by oral medicine residents and specialists. Results: A total of 401 elderly were screened and 147 elderly (36.65%) met the inclusion criteria which are having hypertension and willing to participate in this study. Normal variants of tongue obtained from the examination were fissured tongue (90.48%), coated tongue (63.95%), crenated tongue (33.33%), lingual varices (12.24%), and benign migratory glossitis (4.08%). Conclusion: Fissured tongue was most common normal variant lesion of tongue in elderly with hypertension. Coexistence between hypertension and tongue lesion can be developed from pathological changes of disease or as side effects of medication taken such as antihypertensive drugs.

Keywords: tongue, normal variants, geriatric, hypertension, human and health

EXPLORATION OF POLYMETHYLMETHACRYLATE AND INDONESIAN NATURAL HYDROXYAPATITE AS BIOMATERIAL CANDIDATE DENTAL IMPLANT

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Abstract:

Titanium implant has good osseointegration ability but metal allergies and periimplantitis could not be ruled out. Therefore, exploration of dental implant biomaterials with osseointegration and antibacterial ability is necessary. Polymethylmethacrylate (PMMA) and natural Hydroxyapatite (HA) is abundant material that easily found in Indonesia which may biocompatible, easily manipulated to obtain good osseointegration and antibacterial ability. The aim of this study is to elucidate the PMMA-HA composites as dental implant biomaterial candidate. The sample was PMMA-HA composite with 70:30 and 80:20 ratio, PMMA, HA (N=32/n=4). PMMA-HA biocompatibility composite was examined by scanning electron microscope (SEM), compressive strength test, fourier transform infrared (FTIR), X-ray diffraction (XRD), atomic force microscopy (AFM). Minimum Inhibition Concentration (MIC), Minimum Bactericidal Concentration (MBC), Inhibition zone of PMMA-HA composite against *Aggregatibacter actinomycetemcomitans* (A.a), *Porphyromonas gingivalis* (P.g), *Fusobacterium nucleatum* (F.n) were done with the well diffusion method and examined with spectrophotometry and digital caliper. Doxycycline 100 mg was used as a positive control while the treatment group were consisted of 4 groups. ANOVA continue with Turkey-HSD post-hoc test was performed ($p<0.05$). PMMA-HA ligand-samples and osseintegration molecular marker such as osteopontin, osteonectin, osteocalcin, alkaline phosphatase (ALP), and bone morphogenetic protein (BMP)-2/4/7 were collected, then molecular docking was done by PyMol. PMMA-HA 80:20 ratio has better compressive strength, porous size, surface roughness than PMMA-HA 70:30 ratio. XRD result showed PMMA-HA composite with 70:30 and 80:20 ratio have peaks representing HA and PMMA. In addition, FTIR analysis functional groups of PMMA was found. PMMA-HA composite has the greatest MIC, MBC and inhibition zone against F.n, P.g, A.a than other groups *in vitro* ($p=0.0001$; $p<0.05$). PMMA-HA has the strongest binding with osteonectin and stimulate activity of ALP *in silico*. In conclusion, PMMA-HA composite 80:20 ratio has good mechanical and chemical properties, antibacterial activity *in vitro*, and osseointegration ability *in silico* for dental implant biomaterial development.

Keywords: biomaterial, osseointegration, antibacterial, periimplantitis, dental implant

THE EFFECT OF HYGROMYCIN B QUALITY TOWARDS *CANDIDA ALBICANS* SUSCEPTIBILITY

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Abstract:

Candida albicans is a medically important opportunistic pathogen that can be found in oral cavity. It is greatly associates in mono- and polymicrobial biofilms development with other oral microorganisms. However, aberrant ploidy number and unusual codon usage in *C. albicans* complicate its genetic editing process. Hygromycin B is an antifungal that is useful for a selective marker in *C. albicans* genetic transformation. Specialised codon-optimized hygromycin resistance gene (*CaHygB*) derived from plasmid pYM70 enables *C. albicans* transformants to grow on a selective plate containing hygromycin B. The objective of the study is to determine the effect of hygromycin B quality in the detection of *C. albicans* gene transformation with the hypothesis that the performance of two different qualities is similar during the selection of *C. albicans* transformants on YPD-hygromycin B agar plate. *C. albicans* ATCC MYA-4901 was revived and grown on YPD agar for 48 hours at 37°C. Meanwhile, glycerol stock of *E. coli* carrying pYM70 was revived on LB-ampicillin agar at 37°C for overnight. Plasmid pYM70 was later extracted and used in the subsequent transformation of *C. albicans*. The competent cell of *C. albicans* was prepared using the modified lithium-acetate method. Plasmid pYM70 was transformed into the competent cells of *C. albicans* using the electroporation method. The transformed cells were sub-cultured on YPD agar containing 600 µg/ml hygromycin B from two brands. The growth of transformants was observed after three to four days of incubation at 37°C in a dark environment. Our study showed a successful transformation of *C. albicans* with pYM70, which exhibited resistance towards both hygromycin B (Gb and Bb). However, wild-type and empty competent cells (negative controls) exhibited resistance towards hygromycin B Bb. In conclusion, different qualities of hygromycin B affect the susceptibility of *C. albicans* which may lead to a false result during *C. albicans* transformation.

Keyword: *Candida albicans*, hygromycin B, pYM70, transformation

INHIBITION MECHANISM OF LIPOPOLYSACCHARIDE-INDUCED OSTEOLYSIS AFTER GINGIVAL MESENCHYMAL STEM CELL'S CONDITIONED MEDIUM TRANSPLANTATION

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Abstract

Osteolysis might be occurred due to the excessive and prolong duration of inflammation induced by Lipopolysaccharide (LPS) that affects the patient's quality of life (QoL). Gingival mesenchymal stem cells (GMSCs) conditioned medium (CM) is known for possessing advantageous molecules that may inhibit LPS-induced osteolysis to improve patient's QoL. Moreover, the study on GMSCs-CM inhibiting LPS-induced inflammatory osteolysis is still limited. Thus, the aim of this study was to elucidate the inhibition mechanism of LPS-induced inflammatory osteolysis in calvaria on mice model after transplantation of GMSCs-GM by means of immunohistochemistry examination. Twenty-eight males healthy Wistar rats (*Rattus novergicus*), 1-2 months-old and 250-300 grams body weight were divided into 4 groups: PBS group (100 µg PBS); LPS group (100 µg LPS); LPS and GMSCs group (100 µg LPS and 100 µg GMSCS-CM); and GMSCs group (100 µg). *Escherichia coli* LPS was used to induce inflammatory osteolysis, while GMSCs-CM from GMSCs culture passage 5 was injected subcutaneously over calvaria for 7 days respectively. All samples were sacrificed on Day 8 through cervical dislocation. The immunohistochemistry examination investigated the nuclear factor of activated T cells 1 (NFATc1), sclerostin, tartrate-resistant acid phosphatase (TRAPase), runt-related transcription factor-2 (RUNX2), osterix, fibroblast growth factor-2 (FGF-2), and vascular endothelial growth factor (VEGF) expression along with the number of osteoblasts and osteoclasts in the calvaria. The multivariate analysis of variance (MANOVA) followed by path analysis were completed by multiple linear regression ($p<0.05$). There was significant decreased expression of NFATc1, sclerostin, TRAPase, and the number of osteoclasts. Meanwhile, there was significant enhanced expression of RUNX2, osterix, FGF-2, VEGF, and the number of osteoblasts in LPS and GMSCs-CM group compared to other groups ($p<0.05$). GMSCs-CM transplantation can inhibit osteolysis in rats' calvaria induced by LPS through the mechanism of inhibition expression in NFATc1-sclerostin-TrAPase-osteoclast and enhancement expression in RUNX-osterix-FGF-2-VEGF-osteoblast pathway as documented Immunohistochemically.

Keywords: bone resorption, inflammation, stem cells, regenerative medicine, immunohistochemistry

ITHE EFFECTIVENESS OF ROBUSTA COFFEE BEAN EXTRACT (*COFFEA CANEPHORA)* IN INCREASING OSTEOCALCIN EXPRESSION IN MICE MODEL PERIODONTITIS INSTALLED WITH NICKEL TITANIUM (NITI) WIRE

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Abstract:

Background: Robusta coffee is one of the most consumed beverages worldwide. Robusta coffee bean extract is known to have potential beneficial health implications. A decrease in the number of osteocalcin occurs in inflammatory conditions such as periodontitis caused by LPS *P. gingivalis.* In addition, inflammation in periodontitis can also worsen by exposure to metal construction used in oral cavity such as nickel titanium (NiTi) wire. Purpose: To determine the effectiveness of Robusta coffee bean extract (*Coffea canephora)* in alveolar bone regeneration through increased osteocalcin expression in mice periodontitis model using NiTi wire. Methods: 35 male mice were divided into 7 groups. Group K: control mice, Group P1-P4 mice without therapy; P1: periodontitis mice model (LPS), Group P3: NiTi wire-fitted mice, Group P4: periodontitis mice model (LPS) with NiTi wire, Group P5-P7 mice treated with gel extract Robusta coffee; P5: mice model periodontitis (LPS and gel therapy), Group P6: mice-fitted NiTi wire and gel therapy, Group P7: mice model periodontitis (LPS, NiTi wire and therapy). Mice were decapitated after 15th day. Osteocalcin expressions were evaluate by immunohistochemistry. Result: Robusta coffee extracts increase osteocalcin expression in mice model periodontitis installed with NiTi wire. Conclusion: Robusta coffee bean extracts have potential effect in alveolar bone regeneration through increased osteocalcin expression in mice periodontitis model installed with NiTi wire.

Keywords: osteocalcin, Robusta coffee, periodontitis, alveolar bone resorption, NiTi wire, *in vivo*

EVALUATION OF RAPID TEST KITS FOR DETECTION OF SARS-COV-2-SPECIFIC ANTIBODIES IN SALIVA

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Abstract:

Introduction: The on-going coronavirus disease 2019 (COVID-19) pandemic is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a highly infectious single-stranded RNA (ssRNA) virus that is transmitted via the upper respiratory pathway. Clinical symptoms include shortness of breath, high fever and pneumonia (varying degrees of severities) with global death tolls exceeding 4.35 million. Immunochromatography-based rapid diagnostic tests are essential to detect past infections and seroconversion from immunization. It utilizes recombinant viral proteins as detectors for identification of SARS-CoV-2-specific antibodies in human samples such as whole blood, serum and plasma. This approach, however, is invasive and may trigger substantial anxiety among certain patient population. Thus, saliva samples are seen as possible alternatives for qualitative assessment of specific antibodies. The aim of this study is to evaluate the potential use of several commercially available COVID-19 test kits in the detection of SARS-CoV-2-specific antibodies (IgG and IgM) in saliva samples. Methods: Saliva samples from three vaccinated individuals were collected into sterile containers whereas serum samples were isolated from peripheral blood (venipuncture). All samples were tested on 5 different brands of kits (A-E). Ten µl of samples were dropped onto the cassette and appropriate volumes of buffers were added according to the kit instructions. Results were interpreted within 10 minutes. Results: Antigen-specific IgG antibodies in serum samples were detected in all of the kits used (100.00% positive results), however IgM antibodies were only seen in Kit B (100.00% positive results). With saliva samples, only Kit A and Kit B were able to discern SARS-CoV-2-specific antibodies. Kit A showed 33.33% positive results for both IgG and IgM in saliva while Kit B displayed a positivity of 100.00% and 66.67% for IgG and IgM, respectively. Conclusion: Saliva samples may be utilized as non-invasive substitutes for detection of SARS-CoV-2 antibodies in certain COVID-19 rapid test kits.

Keywords: SARS-CoV-2 antibodies, saliva, serum, rapid test kit, COVID-19

THE ELEVATED OF SALIVA, SERUM, AND TISSUE EXPRESSION OF TNF-α IN RECURRENT APHTHOUS STOMATITIS: A SYSTEMATIC REVIEW

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Abstract:

Introduction: TNF-α is a very useful mediator of inflammation and immune function and is produced by paracrine and endocrine. In addition, TNF-α also functions in the regulation of growth and differentiation of various cell types. Recurrent aphthous stomatitis (RAS) is the ulceration of the oral cavity that cause of inflammation. The incident of RAS is related with elevated of pro-inflammatory cytokine such as tumour necrosis factor α (TNF-α). Hence, the objective of the present systematic review is to explore the elevated of saliva, serum and tissue TNF-α expression in patients with RAS. Methods: A comprehensive search of PubMed, Scopus, Cochrane library, Web of Science databases and Embase, was conducted during January 2020 - February 2021. The inclusion criteria were observational studies that assessed the saliva, serum and RAS lesion with the outcome reported the mean of saliva, serum and tissue expression of TNF-α. Studies without control groups, case series, case reports, experimental studies, letter to editors, reviews, were excluded. Result: Seventeen studies present the quantification of TNF-α in RAS patient. Three studies reported the tissue expression of TNF-α (110 RAS patient) with the elevation 2.2 times until 6 times, seven studies reported the TNF-α expression on saliva (188 RAS patient) with the elevation 0.5 times until 3.56 times and six studies reported the TNF-α expression on serum (360 RAS patient) with elevation 1.03 times until 3.82 times. One study reported TNF-α expression on saliva (20 RAS patient) and serum (21 RAS patient). Conclusion: The TNF-α expression on saliva, serum and tissue of RAS patient is elevated. The elevation of TNF-α expression occurred not only in the lesion but also systemically.

Keywords: TNF-α, recurrent aphthous stomatitis, saliva, serum, tissue

THE HISTOPATHOLOGY AND IMMUNOHISTOCHEMISTRY DIAGNOSIS OF PIGMENTED FUNGIFORM PAPILLAE: A SYSTEMATIC REVIEW

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Abstract:

Introduction: Pigmented fungiform papillae of the tongue is often mistaken as malignant pigmentation lesion due to its appearance. There is limited information available on this condition in the literature thus the general dentist may have challenges in recognizing it in their routine practice. Histopathology and immunohistochemistry diagnosis provide a specific feature for pigmented oral lesion and consider as the gold standard for diagnosis. Objectives: A systematic review was performed to evaluate the published papers related to pigmented papillary fungiform on the tongue, aiming to understand the diagnostic role of histopathology and immunohistochemistry examination in pigmented papillary fungiform. Methods: The Preferred Reporting Items for Systematic reviews and Meta-analyses (PRISMA) was performed in PubMed, Google scholar and Embase databases. The included criteria were age, gender, race, anatomical location or distribution of pigmented fungiform papillae, clinical appearance, histopathological and immunohistochemistry diagnosis. Results: Eight studies with eight cases, reported of pigmented papillary fungiform of the tongue. Five studies (consist five cases) reported histopathology diagnosis only and two studies (consist two cases) reported histopathology and immunohistochemistry diagnosis. The clinical appearance was rose petal pattern (4/7) and cobblestone pattern (3/7). The histopathology diagnosis revealed the presence of melanophages in the lamina propria or sub-epithelial, hyperpigmentation of basilar keratinocytes, and lymphocytes infiltration in the superficial chorion. The immunohistochemistry showed an immune-reactive for CD3+ T lymphocytes, Melan-A, and S-100 in the intraepithelial melanocytes. Conclusion: The presence of melanophages and hyperpigmentation of keratinocytes in the histopathology and immunohistochemistry characteristic able help clinicians recognize and differentiate from other oral pigmentation.

Keywords: pigmentary disorders, fungiform papillae, oral medicine, human & health, tongue

MALNUTRITION EFFECT AND IMMUNOLOGICAL DYSFUNCTION IN ORAL CANDIDIASIS: A LITERATURE STUDY

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Abstract:

Objective: Malnutrition is a condition in which the body macronutrients such as carbohydrates, fat and protein become severely deficient secondary to poverty or food insecurity. Previous studies have shown an increase prevalence of oral mucosal infection amongst malnourished patients, which can be caused by bacteria, fungi or parasites. Oral candidiasis is a common type of oral mucosal infection caused by fungus called *Candida albicans*. However, the mechanism underlying the association between oral candidiasis and malnutrition remain unknown. Methods: A literature search was conducted using PubMed / Medline and Google Scholar between 2017 – 2021 using keywords the mechanism between malnutrition and the increase in oral candidiasis. Result: Malnutrition condition affect the efficiency of immunocompetent cells, mainly neutrophils, macrophages, and lymphocytes. Lack of nutritional intake will cause a decrease in metabolism, thereby reducing the immunocompetent condition. These immunocompetent cells would not be able to produce antibodies nor carry out their functions as phagocytic cells against pathogens due to decrease in energy and protein. Changes in the oral environment will cause opportunistic infection where normal flora, especially fungi, develop into pathogens. Conclusion: Induce oral immunologic dysfunction resulting in oral environment in the oral cavity causing the normal flora of the oral cavity to become pathogenic.

Keyword: malnutrition, mucosal immunity, oral candidiasis

THE PREVALENCE OF NON-*ALBICANS CANDIDA* IN ORAL SQUAMOUS CELL CARCINOMA: A REVIEW

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Abstract

The survival rate of oral squamous cell carcinoma (OSCC) has not improved over the past 30 years. *Candida albicans* has been reported to be the aetiological factor amongst OSCC patients. However, there are limited number of studies that had determined the prevalence of non-*albicans Candida* (NAC) in OSCC patients compared to *C. albicans*. Hence, this review aimed to compare the prevalence of *C. albicans* and non-*albicans Candida* infections between OSCC patients and healthy individuals. This review was conducted according to the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2015 Guidelines. Various databases which include Scopus, PubMed, Science Direct, Public Library of Science (PLOS) databases, and Google Scholar search engine were searched from January 2016 until April 2021 using the keywords '*Candida* colonisation' or '*Candida* isolation' and 'oral candidiasis' or 'oral candidosis' and 'oral cancer' or 'oral squamous cell carcinoma'. Only the original and English articles were included. Joanna Brigg Institute (JBI) Appraisal Tools was used to assess the relevance and results of the published paper. The searching resulted in 6,275 articles identified (Scopus-14, PubMed- 4344, Science Direct- 434, PLOS- 1330, Google Scholar- 153) but only five articles were included in this study. The study showed that *Candida* spp. were more prevalent in OSCC patients as compared to healthy individuals. Furthermore, a higher number of NAC were isolated from OSCC patients as compared to *C. albicans*. *C. tropicalis* is the most prevalent NAC being isolated from OSCC patients. In conclusion, NAC is more prevalent in OSCC as compared to *C. albicans*, thus the focus should also be made on NAC in OSCC patients.

Keywords: oral squamous cell carcinoma (OSCC), *Candida albicans*, *non-albicans Candida*

THE ROLE OF THE IMMUNE AND ENDOCRINE FUNCTION IN PATIENT BURNING MOUTH SYNDROME WITH MODERATE DEPRESSIVE EPISODE ACCOMPANIED GASTRO-ESOPHAGEAL REFLUX DISEASE: A CASE REPORT

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Abstract

Background: Burning mouth syndrome (BMS) is a chronic disease characterized by taste change and burning mouth feeling with oral mucosa, which is clinically normal. The predisposition factor of this case, psychogenic factors were in a moderate depressive episode worsened by gastroesophageal reflux disease (GERD). Purpose: The purpose of this case is to discuss role of immune and endocrine function in BMS with risk factor moderate depressive episode patient worsening by GERD. Case: Indonesian female 19 years old, she complained of felt of burning in her entire mouth shortly after ate chili sauce. She felt a burning sensation for 4 months. Burning sensation in the mouth followed by burning sensation in the chest, especially when eating spicy and sour, another complaint were anxious and stressed. After a thorough history, physical and supportive examination, and also filling out *DASS 42*, refer to internist and psychiatry we made a diagnosis of burning mouth syndrome in Moderate Depressive Episode with GERD. Case Management: Oral hygiene instructions, advice to avoid spicy and sour diet and prescription of oral mouthwash chlorine dioxide and sterile water mixed soda bicarbonate, have been given to reduce the symptoms of BMS. The patient has been referred to the internist given therapy lansoprazole and braxidin. The patient also has been referred to a psychiatrist given sertraline and clobazam. Conclusion: The etiology of BMS is not fully understood, but it is thought to be multifactorial with local, systemic and psychological factors, may can altering immune and endocrine function all thought to be important.

Keywords: burning mouth syndrome, GERD, depressive episode

THE CHALLENGE OF TREATING HIV/AIDS PATIENTS WITH OROPHARYNGEAL CANDIDIASIS DURING COVID-19 PANDEMIC IN SURABAYA, EAST JAVA

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Abstract:

Background and Aim: Oropharyngeal candidiasis is one of the opportunistic infections in HIV/AIDS patients. The treatment of the patient on early COVID-19 pandemic in Surabaya, East-Java is a challenge. This is because the use of teledentistry had its limitations for dentists to monitor patient conditions. Another intricacy is the access to antifungal drugs availability and counselling for HIV-AIDS status to obtain Anti Retro Viral drugs was a problem for the patient. Case: In this case, we present a 26-year-old man with a history of antiretroviral therapy withdrawal who came on an early pandemic. He had an oral manifestation of oropharyngeal candidiasis then received ketoconazole as the therapy. He experienced prolonged recovery due to the difficulties get Anti-Retroviral (ARV) drugs therapy during a pandemic condition. He was then in a coma and admitted to the ICU as a result, after regaining consciousness and receiving ARV therapy, he again experienced recovery and showed a very satisfactory improvement. Conclusion: This case report shows that on early COVID-19 pandemic eras, we will find that there will be more effort to treat some common diseases because of the difficulties to reach access for medication.

Keywords: oropharyngeal candidiasis, opportunistic infection, teledentistry, COVID-19

COL1A1 AND *FGFR2* SINGLE NUCLEOTIDE POLYMORPHISMS FOUND IN CLASS II AND CLASS III SKELETAL MALOCCLUSIONS IN JAVANESE POPULATION

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Abstract:

Introduction: *COL1A1* and *FGFR2* are two out of several genes associated with malocclusion phenotype. This research aimed to analyse and compare the presence of Single Nucleotide Polymorphisms (SNPs) of *COL1A1* and *FGFR2* in class II and class III Javanese patients. Methods: Criteria samples are Javanese individuals, ANB $\geq 4^0$ and large overjet (for class II malocclusion) or ANB $\leq 0^0$ and negative overjet (for class III malocclusion), and minimum age of 18 years old. Cephalometric radiographs from total 63 of class II and III were analysed. SNP analysis was carried out based on both *COL1A1* and *FGFR2* sequences amplified from total DNA of patients' fresh blood. DNA was isolated from patients' fresh blood samples followed with PCR based on *COL1A1* and *FGFR2* forward primer. Then, PCR products were undergone electrophoresis using 1% agarose in TBE. Electrophoresis was carried out with a voltage of 50 volts in 1 hour. Samples were sequenced using the Sanger sequencing method. Result: In *COL1A1*, there are 3 SNPs found in a significant number in class II samples: rs2277632T/C, rs2249492G/A and rs50186619C/T. In class III skeletal malocclusion, there are only 2 SNPs found: rs2249492G/A and rs2277632T/C. In *FGFR2*, found in both class II and class III malocclusion: rs2981582T/C, rs2162540G/A and rs3135724G/A. Conclusion: There are many SNPs of *COL1A1* and *FGFR2* that found in class II and class III malocclusion.

Keywords: *COL1A1*, *FGFR2*, single nucleotide polymorphisms, skeletal malocclusion, Javanese, human health

MECHANISM OF IgE-MEDIATED IMMUNE RESPONSES IN ALLERGIC STOMATITIS AND THE THERAPEUTIC MANAGEMENT: A CASE REPORT

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Abstract:

Introduction: Allergic stomatitis is a hypersensitivity reaction characterized by a defect/ abnormality in the epithelium involving the basal membrane, with the cause of certain food or drug allergies. Food allergic reactions can manifest as recurrent ulcers in the oral cavity. Food allergies often involve hypersensitivity reactions of type 1 and type 4, or a combination of both. Type I hypersensitivities include allergic stomatitis, which are an exaggerated IgE mediated immune responses. Case: The 17-year-old woman came up with a complaint of thrush on her inner lower left lip, and felt pain. Patients also say frequent canker sores without knowing the cause. In extraoral there is a desquamation and Intra oral picture showing in the left labial mucosa of the lower jaw there is an ulcer, solitary, oval: 8.5x5.5 mm, yellowish white, irregular edges, clear borders, slippery surface, red surrounding tissue, pain. Complete blood test results and total IgE serology found increased levels of leukocytes, neutrophils, monocytes, LEDs, LEDs and IgE totals. The results of the prick test showed the results of foodstuffs that have a moderate positive value (++) namely beef, and duck egg white, strong positive values (+++) namely histamine as a control, house dust, kapok and duck egg yolk. Patients are prescribed anti-inflammatory corticosteroid triamcinolone acetonide 0.1% in orabase because it has anti-inflammatory effects and accelerates the healing of lesions as well as reducing allergic effects. Conclusion: Recurrent ulcers in the oral cavity caused by a type I hypersensitivity reaction with a history of lesions that do not heal require a complete anamnesis and supporting examination to be able to establish a definitive diagnosis, to provide more accurate therapy. Type I hypersensitivity is also known as an immediate reaction and involves immunoglobulin E (IgE) mediated release of antibodies against the soluble antigen.

Keywords: stomatitis, allergy, hypersensitivity type 1, IgE, triamcinolone acetonide

STOMATITIS INDUCED BY ALLERGIC REACTION AGAINTS *CANDIDA ALBICANS*

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Abstract:

Background: Stomatitis can be induced by various factors, whether local or as a manifestation of systemic diseases, such as allergic reaction against certain allergens. *Candida albicans* is an opportunistic common microorganism in the oral cavity, and as well as the ability to turn pathogenic, it can also trigger allergic reaction in certain individuals. In those cases, it may become difficult to distinguish if the oral lesion is related to infection or allergy. Purpose: This case report discusses a case of Stomatitis induced by allergic reaction against *C. albicans* in a 55-year-old man. Case: The patient complained of painful red and white patches on the surface of his tongue and ulcer on the inside of his lip, gum, and tongue since 6 months ago. Sometimes a lump appeared on the tongue followed by an itchy lump on the skin. Case Management: Based on microbiological examination, patient was diagnosed with oral candidiasis and then prescribed topical antifungal suspension. Some remission was observed on follow-up, but the patient kept complaining of itches and burns, so allergy examination was conducted. The result came back positive, and so was the specific allergy test towards *C. albicans*. The antifungal therapy was proceeded in combination with allergy management while the patient was also referred to the internist to treat his systemic symptoms. Oral lesions healed after 1 month of treatment. Conclusion: Clinicians must be able to recognize various manifestations of allergic reactions to define a proper diagnosis and provide appropriate treatment. It requires a multidisciplinary approach to achieve a complete recovery.

Keyword: stomatitis, allergy, allergic reaction, *Candida albicans*

CHALLENGES IN THE DIAGNOSIS OF CHRONIC TRAUMATIC ULCER RESEMBLING ORAL SQUAMOUS CELL CARCINOMA

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Abstract:

Background: Defects in the epithelium, underlying connective tissue, or both are signs of ulceration. Diagnosing oral ulcerative lesions may be quite challenging due to the diversity of causative factors and the presenting features. Chronic traumatic ulcer (CTU) is one of the most common ulcerations and is often diagnosed in comparison with oral squamous cell carcinoma (OSCC) with its characteristic appearance, especially the clinical picture of a solitary chronic ulcer on the tongue. Purpose: The purpose of this case report is to provide information about the diagnosis and management of cases of CTU resembling OSCC. Case: A 29-year-old woman with the chief complaint of a painful, non-healing ulcer located on the right lateral side of the tongue for the previous two months. The patient's mother's medical history is a cancer patient. Intra-oral examination on the right lateral side of the tongue showed a 10 mm x 5 mm yellowish-white ulcer, irregular edges, well-defined borders, surrounded by exophytic edges and painful. Histopathological examination showed squamous epithelial cells with intact basal layer with cells within normal limits. The stroma is moderately to densely pack with inflammatory cells, lymphocytes and neutrophils. The lesion was excised and healing proceeded smoothly without recurrence in more than 4 months. Conclusion: Establishing proper diagnosis and treatment of CTU lesions is very important because of their role in the promotion stage of oral carcinogenesis, especially lesions that closely resemble the characteristics of malignant lesions.

Keywords: chronic traumatic ulcer, management, oral squamous cell carcinoma

THE ROLE OF *STREPTOCOCCUS VIRIDANS* IN SECONDARY INFECTION OF SIALOLITHIASIS: A CASE REPORT

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Abstract:

Background: Sialolithiasis is a condition of the formation of salivary stones within the ducts of the major salivary glands. Sialolithiasis in the submandibular salivary glands resulted in a decrease in salivary flow rate. This cause bacterial colonization of the gland ducts which leads to abscess formation. *Streptococcus viridans* is a group of Gram-positive bacteria that have the potential to become pathogens and are part of the normal flora of the oral cavity. The diagnosis of submandibular sialolithiasis used radiographic and bacterial culture from pus production. Purpose: The purpose of this case is to discuss the role of *S. viridans* in secondary infection of sialolith. Case: A 27-years-old man with complaints of swelling and pain on the floor of the mouth on the right side, then spread to the neck for two weeks. Two days after swelling appears the patient feels fever. A day before going to Dental Hospital of Airlangga University, the patient felt there was pus that came out spontaneously and tasted salty. Intraoral examination on floor of the mouth found nodular, solitary, oval, surrounding tissue colour, diffuse border, smooth surface, hard and painful palpation. Case Management: Prescription of amoxicillin, sodium diclofenac, and povidone iodine mouthwash. Diagnosis of sialolithiasis was determined from standard occlusal mandibular and sialography. The bacterial culture did not reveal any pathogenic bacteria and only *S. viridans* was found. After sialography procedure the sialolith drainage spontaneously. Conclusion: The colonization of *S. viridans* able to induce the sialolith formation and lead the secondary infection. Sialography able to be used as the diagnosis procedure and treatment for the case of sialolithiasis.

Keywords: sialolithiasis, sialography, bacterial infection

OSTEOGENIC AND BONE REGENERATION POTENCIES OF DENTAL TISSUE-DERIVED STEM CELLS LOADED IN HYDROXYAPATITE AND POLYCAPROLACTONE SCAFFOLDS

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Abstract:

Stem cells from dental pulp are an alternative source of stem cells that are easily available for bone tissue engineering. The usage of different scaffolds and their effect on the osteogenic performance of stem cells of dental pulp is not well studied and this can affect the selection of suitable scaffolds for transplantation. Hence, this study aimed to investigate the comparative ability of stem cells from human exfoliated deciduous teeth (SHED) and human dental pulp stem cells (hDPSC) loaded in hydroxyapatite (HA) and polycaprolactone (PCL) scaffolds in augmenting osteogenic differentiation and maxillary bone regeneration. Cells were extracted from human deciduous and permanent teeth using enzymatic digestion and cultured until passage three. SHED and hDPSC were then cultured on HA and PCL scaffolds and *in vitro* cell viability and osteogenic potential were determined prior to *in vivo* transplantation. Samples were then transplanted into rats with surgical-made maxillary bone defect for six weeks and analysed via micro-computed tomography (micro-CT) and histology. Both scaffolds were found to be able to support growth of SHED and hDPSC which reflect compatibility to cell viability. An early sign of osteoblast differentiation can only be detected on PCL scaffold. However, cells on HA scaffold showed more prominent results with intense mineralized nodule, activation of osteoblast markers, and significantly ($p<0.05$) high levels of ALP activity with prolonged osteoblast induction. SHED showed a significantly ($p<0.05$) enhanced cell viability on the HA scaffold, accompanied by an increase of osteoblastic phenotypes. Micro-CT and histology analyses confirmed *in vitro* results with new bone formation of SHED and hDPSC was significantly ($p<0.05$) greater in HA scaffold. This study demonstrates good prospects for using stem cells from human dental pulp with HA scaffold to regenerate new bone for clinical use in cell-based tissue engineering.

Keywords: adult stem cells, hydroxyapatite (HA), polycaprolactone (PCL), rat, osteogenesis

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