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Proceedings of the Faculty of Medicine Academic Sessions (FMAS) 2022, University of Ruhuna

Cover story: Development of a herbal capsule of *Coccinia grandis* L. for type 2 diabetes mellitus

Type 2 diabetes mellitus is a major global health pandemic in this century, which has increased its incidence rapidly over the past ten years. *Coccinia grandis* (Linn.) Voigt (Cucurbitaceae), Kowakka or Kemvel (in Sinhala), Ivy gourd/ scarlet gourd/tindora, and kowai fruit (in English) is an edible perennial climber commonly found in Sri Lanka and in tropical Asia. Based on the findings of extensive preclinical studies a project was designed to investigate the antidiabetic efficacy and safety of the herbal capsule of *C. grandis* through a randomized double-blind, placebo-controlled clinical trial (SLCTR/ 2018/012) targeting the effective management of early-stage diabetes in newly diagnosed patients with type 2 diabetes.

The herbal capsule made of *Coccinia grandis* by the collective scientific effort from Dr K.G. Piyumi Wasana, Prof Anoja Attanayake, Prof Thilak Weerarathna, and Prof Kamani Jayatilaka, Faculty of Medicine, University of Ruhuna, Sri Lanka. The project was financially supported by the National Research Council, Sri Lanka (NRC 17-29). This is the first research project conducted on the evaluation of the efficacy and safety of the herbal capsule of *C. grandis* in newly diagnosed patients with type 2 diabetes mellitus.

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Contents

Instructions to Authors

The Ruhuna Journal of Medicine (RJM) is published by the Faculty of Medicine, University of Ruhuna. The journal publishes original research articles, reviews and case reports.

Types of articles

Original articles
The text of original article encounting up to 2000 words (excluding abstract, references and tables) should be divided into sections with the headings; Abstract (unstructured max 250 words), Key words, Introduction, Material and Methods, Results, Discussion, References, Tables and Figure legends.

Review articles
It is expected that these articles would be written by individuals who have done substantial work on the subject or are considered experts in the field. The prescribed word count is up to 4000 words excluding abstract, tables and references. The manuscript should have an unstructured Abstract (max 250 words) representing an accurate summary of the article.

Case reports
These communications could be of up to 1000 words (excluding abstract and references) and should have the following headings; Abstract (unstructured max 150 words), Keywords (max 5), Introduction, Case Report, Discussion, Reference, Tables and Figure.

References
Personal communications and unpublished works should only be mentioned in the text. Reference citations in the text should be identified by numbers in brackets (eg. [l, 2]) before the punctuation marks. References should be numbered consecutively in the order in which they are first mentioned in the text. List all authors when three or less; when four or more, list only first three and add et al.
Examples;

Articles in Journals: Rechel B, Ahmedov M, Akkazieva B, et al. Lessons from two decades of health reform in Central Asia. Health Policy Plan2012; 27(1): 281-287. (eg. BMJ type)

Books: AminoffMJ. Electrodiagnosis in clinical neurology. 2005; Elsevier, USA.

Books chapters: Kumar P, Clark M. Cardiovascular disease: Camm AJ, Bunce NH, editors. Clinical Medicine. USA: Elsevier; 2005; 725-872.

Tables
Tables should be self-explanatory and should not duplicate textual material. Number tables, in Arabic numerals, consecutively in the order of their first citation in the text and supply a brief title for each.

Illustrations (Figures)
Figures should be numbered consecutively according to the order in which they have been first cited in the text.

Authorship Criteria
Authorship credit should be based only on substantial contributions to each of the three components mentioned below.

1. Concept and design of the study or acquisition of data or analysis and interpretation of data;
2. Drafting the article or revising it critically for important intellectual content; and
3. Final approval of the version to be published.

Message from the Chairperson

It affords me great pleasure to send this message on behalf of the organizing committee of the Faculty of Medicine Annual Academic Sessions, FMAS 2022. The theme selected for this 10th academic sessions "Facing Health Challenges in Economic Scarcity" is a very timely topic as a country since Sri Lanka is experiencing the bitter taste of economic crisis at present.

We are privileged to have an eminent academic to deliver the keynote speech on the economic aspect of health challenges and the symposium is focused on the practical aspects of facing health challenges, possible management strategies with limited resources and the effect of economic crisis on psychological wellbeing of the people. The oration, presentations based on completed postgraduate degrees and free paper sessions provide a very good opportunity to disseminate the knowledge and showcase novel findings. The platform created for undergraduates to present their research findings in front of a distinguish gathering will help to improve their research and presenting skills and also will inculcate research culture among future generations.

I wish to express my sincere gratitude to Vice Chancellor, University of Ruhuna and Dean, Faculty of Medicine for their support and guidance given to make this event a success. Finally, I am greatly indebted to all the members in the organizing committee of FMAS 2022 for their hard work during the past few months amidst all the difficulties to make this event a reality. I fervently hope that you will enjoy and immensely gain from FMAS 2022.

Dr. Eric De Zoysa
Chairperson, FMAS 2022

Message from the Vice Chancellor

Facing health challenges in economic scarcity

It gives me immense pleasure to send this message to FMAS 2022 under the theme "Facing health challenges in economic scarcity" which is a hot topic that should be addressed scientifically by the health care community.

Entire Sri Lanka tasted the economic crisis to a greater or lesser extent with no exception based on social class. Crises create challenges and opportunities. A resilient nation could capitalize on opportunities in crisis situations. Then, it becomes the best time to realize that we could only develop as one nation devoid of ethnoreligious sectoral differences. The recent few months after the crisis apparently has created a complacency resulting in a "forgotten impact" of the burning issues. This is dangerous as it will lead to loss of interest in the development of the nation.
This is the right time for a genuine dialogue on all our past problems without any power wielding organizations manipulating such discussions using their power. This comment is applicable to political parties, trade unions and political organizations with different nomenclatures. Now, I doubt whether our nation ever learnt lessons from this crisis.

The national health system/model was under regulated and ailing and failing for decades. Hence, the related crises were being experienced inevitably anyway on a regular basis. The difference is economic scarcity. Therefore, new challenges have emerged needing innovative solutions while the old issues have been exaggerated. e.g Funding shortages.

As a nation, we could overcome all these challenges despite the economic scarcity. We need to reduce wastage and corruption immediately. Our health system is not poor. It is very rich in skilled human resources working under a strong government controlled mechanism despite the crisis but with weak internal monitoring systems.

Stopping or reviewing the need for mega projects with high recurrent costs giving small returns should be a priority based on scientific and economic data. Resource sharing and optimizing utilization of skilled human resource pool like in developed/high income countries should be adopted immediately. Large investments in preventive health (public health) will give a high yield in the long run and reduce the expenditure on curative sector. Restructuring the model to reduce idle labour with a better monitoring tool will hurt the entire health care worker population. Sadly, there is no alternative choice.

Finally, I congratulate the FOM UOR for organizing this event and wish the FMAS all the success.

Senior Professor Sujeewa Amarasena
Vice Chancellor
University of Ruhuna

Message from the Dean

It is with great pleasure I am sending this message to FMAS 2022. I am privileged as the dean to send messages to FMAS for the fourth consecutive year. It has been a never-ending challenge to organize such events during a turmoil period in which everything was uncertain. Let me first thank all who have worked tirelessly and fearlessly to make FMAS2022 a reality, which include the Chairperson, Secretary and the Steering Committee and all the chairpersons and members of the committees and other members of the academic staff who contributed in every possible way. You are my main strength. I must also express my sincere gratitude to the Vice Chancellor, the Heads of the Departments and the administrative staff for what they have done to make FMAS a reality in an economic scarcity.

I am sure that this event with the theme "Facing Health Challenges in Economic Scarcity" will be a huge success as an academic activity, which will stimulate all of us to look at, and solve health related problems in novel way under unusual circumstances. I hope this will help us to behave in a different way as health care professionals. In addition, it will give us the insight to make health care professionals who are capable of delivering effective health care for the people of this country, irrespective of whatever challenges they are to face in the future.

I congratulate the chairperson, steering committee and the members of all the committees who worked hard to make the FMAS 2022 a reality.

Professor Vasantha Devasiri
Dean, Faculty of Medicine
University of Ruhuna

Faculty of Medicine Academic Sessions (FMAS) 2022 University of Ruhuna

Wednesday 14th December 2022

TW Wikramanayake Auditorium, Faculty of Medicine, University of Ruhuna

Theme: "Facing health challenges in economic scarcity"

0745-0800 hrs	Guests to be seated
0800-0810 hrs	Ceremonial procession
0810-0815 hrs	University song & Faculty song
0815-0820 hrs	Lighting of the oil lamp
0820-0825 hrs	Welcome speech by the Chairperson FMAS 2022 *Dr. Eric De Zoysa*
0825-0830 hrs	Address by the Dean, Faculty of Medicine *Professor Vasantha Devasiri*
0830-0840 hrs	Address by the Chief Guest, Vice Chancellor, University of Ruhuna *Senior Professor Sujeewa Amarasena*
0840-0915 hrs	Keynote Address "Health Challenges in Economic Scarcity" *Professor Amala De Silva, Professor in Economics* *Faculty of Arts, University of Colombo*
0915-0930 hrs	Deans' Awards 2021
0930-0945 hrs	Research Publication Awards Ceremony
0945-1025 hrs	FMAS Oration 2022 "Clinical Utility of Bone Turnover Markers in Sri Lanka: The Way Forward" *Ms. Hasanga Rathnayake, Senior Lecturer in Biochemistry.* *Department of Biochemistry*
1025-1040 hrs	Cultural event
1040-1045 hrs	Vote of thanks by the Secretary FMAS 2022 *Dr. Udari Egodage*
1045-1050 hrs	National Anthem and Closing ceremony

1050-1110 hrs	Tea Break and Poster Session - I
1110-1240 hrs	FMAS Symposium: "Facing health challenges in economic scarcity"
	“Resolving Family Health Issues during economic scarcity”
	Dr Chithramalee de Silva, Director Maternal and Child Health,
	Family Health Bureau, Ministry of Health
	“Health promotion in building a resilient health system during economic downturn”
	Dr Susie H Perera, Deputy Director General Public Health Services,
	Ministry of Health
	“Economic scarcity and mental health”
	Dr Vajira Dharmawardene, Senior Lecturer in Psychiatry, Department of Psychiatry, Faculty of Medicine, Sabaragamuwa University of Sri Lanka
1240-1330 hrs	Postgraduate research presentations
	Patterns and determinants of drug use and its effects among drug addicts in selected drug rehabilitation centers in Sri Lanka and factors affecting relapse after rehabilitation
	Dr I LAN Darshan, Department of Community Medicine
	Pulmonary function test abnormalities in patient with rheumatoid arthritis: a single center study at a teaching hospital in Sri Lanka
	Dr Udari Egodage, Department of Physiology
	Prevalence and molecular analysis of carbapenem resistance among clinical isolates of *Pseudomonas aeruginosa* in a tertiary care hospital
	Dr Dulanie Wijeweera, Department of Microbiology
1330-1415 hrs	Lunch Break and Poster Session- II
1415-1515 hrs	Free paper session- Open category
1515-1615 hrs	Free paper session- Undergraduate category
1615-1630 hrs	Awards ceremony
1630 hrs	Tea

Health Challenges in Economic Scarcity

Sri Lanka is currently undergoing its worst time since independence. The Economic Crisis of 2022, follows two years of the Covid-19 pandemic, and the Easter bombings of 2019 that disrupted the economy, particularly the tourist sector. The problems in the Sri Lankan economy stem further back, and are attributed to the open economy, poor targeting of macroeconomic variables, uncontrolled borrowing and the unproductive use of borrowed funding from an economic perspective, but with political factors, poor management and administrative shortcomings blamed as well.

However, of most concern to this audience is not how economic scarcity arose as a result of the economic crisis but what repercussions such economic scarcities have: at household, sectoral and national level on the health status of the population.

Scarcity, the central theme of the subject Economics stems from two sources: limited resources and unlimited wants. The economic crisis in 2022, is termed a period of stagflation by Macroeconomists meaning a period of depression, characterized by low economic growth and high unemployment combined with the economy being subjected to hyperinflation. Stagnation will result in lower government allocations to the health sector while the rise in prices, mainly as a result of exchange rate depreciation, will reduce state purchasing power. Households too will now have less income to spend on private healthcare including purchase of drugs so demand will shift to the state sector making its scarcity worse. Combined with this will be a rise in health wants as malnutrition and economic stress worsen the burden of communicable and non-communicable diseases.

Many challenges face health policy makers in this time of economic crisis and scarcity. Health system reforms seem essential, but given the hardships of the community and political instability is this the time for such reforms? This is the dilemma we face today.

Senior Professor Amala de Silva,
Department of Economics
University of Colombo

Resolving Family Health Issues during economic scarcity

Reproductive, maternal, newborn, child and adolescent health services in Sri Lanka are delivered through the Family Health Programme. The Family Health Bureau of the Ministry of Health is the focal point to deliver the RMNCAYH programme. It follows the life cycle approach and the continuum of care. The principles of care such as equity, quality and universal health coverage within the health system are followed. The program is delivered through different levels of hospitals and teams of Medical Officers of Health across the country. The aim of the presentation is to discuss the impact of the present economic crisis on the family health programme and the strategies to mitigate the impact on health outcomes.

The economic downturn and associated socio-economic vulnerability of the population affect all six building blocks of the health systems framework. The lack of sustainable financing for the Family Health programme leads to deficiencies in health commodities and supplies which in turn affects the health status of the population particularly the most vulnerable. Service delivery mechanisms and intervention coverage is affected due to human resource availability, transport and accessibility, maintenance of health information systems, monitoring and supervision.

The economic downturn may increase the demands on the government health system. Lack of affordability of private health care, changing risk behaviours and disease epidemics result in changes in health outcomes and the demands on the existing health services. The growing trend of child undernutrition is a good example of such increasing demands.

Despite increasing health demands and the lessened ability to respond, national health targets and sustainable development goals must be achieved as a country. Innovative approaches and health models need to be devised and piloted for financing health programmes and maintaining service delivery. Multi-sectoral support and collaboration supported by the highest political leadership is essential to manage public health problems such as childhood malnutrition.

Dr Chithramalee de Silva
Director Maternal and Child Health
Family Health Bureau, Ministry of Health

Health promotion in building a resilient health system during economic downturn

Health promotion is considered an integral part of any public health program. Often the emphasis given for its adoption into the health systems is a decision to be made by the policy makers for health. Prevention verses treatment of the sick have significant long-term implication on financing of health. Since the first International conference on health promotion and the Ottawa Charter in 1986, several global attempts have been made through world health assemblies to keep the focus on disease prevention.

The country economic status and government commitment for health determines the fiscal space for health. A significant proportion of health expenditure in Sri Lanka has been for medicines and supplies as well as for health staff salaries and other remunerations. Investments in public health programs per se have been less than for curative care. Health promotion is a key function in almost all public health programs and is a key strategy adopted in the community health programs and is generally considered cost beneficial.

Recent COVID 19 pandemic showcased the importance of prevention strategies indicating importance of behavioural aspects for health (hand hygiene, social distancing, respiratory etiquette, mask). Current economic crisis in Sri Lanka is pointing towards need for more wellness preservation strategies dictating the importance of health promotion across a wider scope for better health. The presentation explores further the place for health promotion in the context of economic downturn in Sri Lanka.

Dr Susie Perera
Public Health Specialist, Deputy Director General Public Health Services II
Ministry of Health

Economic Scarcity and Mental Health

It's well established that low socio-economic status is associated with poor mental health. As a country's economic status worsens, we could expect the general psychological wellbeing of the population to suffer.

An economic crisis affects mental health in two main ways; firstly, the protective factors that guard against mental ill health are weakened, and secondly, the risk factors for mental ill health are either created or amplified. For example, employment is a protective factor for mental health and Job insecurity can have a spiraling d effect on mental health. Poverty is a pervasive risk factor for poor mental health. It has a detrimental effect on both physical and mental health. Individuals in poverty are in a continuous state of elevated stress. Poverty limits their access to the available resources as well, compounding the impact. The resulting poor mental state or illness would limit the affected individual's ability to earn further.

Though almost all are affected by an ongoing economic crisis, not all are affected equally. Marginalized segments in the society are disproportionately affected, necessitating mitigating efforts having a special emphasis on addressing needs of these segments.

Some of the interventions needed are clearly beyond the scope of health system. The evidence indicates the social protection mechanisms are crucial in mitigating impact on mental health in the economic crisis.

It is also vital to have an insight into the processes involved in association between economic scarcity and poor mental health. It is not the real income alone that determines the poor mental health outcome. There is evidence to suggest individual perspectives also plays an important role in determining the impact of economic scarcity. Such information also could be usefully utilized in combating the effects of economic scarcity at an individual and sometimes at societal levels as well.

Dr Vajira Dharmawardene
Senior Lecturer in Psychiatry,
Faculty of Medicine,
Sabaragamuwa University of Sri Lanka

Ongoing postgraduate research projects & thesis submitted during 2022 from projects registered at the Board of Study in Medicine, Faculty of Medicine, University of Ruhuna and Faculty of Graduate Studies, University of Ruhuna

MPhil Degrees

MPhil studies in progress

01.Development of effective sunscreen formulation from medical plant in Sri Lanka: An *in vitro study*

Candidate - CE Liyanarachchi, Department of Biochemistry, faculty of Medicine, University of Ruhuna

Principal Supervisor - Prof. MT Napagoda, Department of Biochemistry, Faculty of Medicine, University of Ruhuna

Co-Supervisors - Prof. L Jayasinghe, Natural Products Research Division, Natural Institute of Fundamental Studies, Kandy

Dr. S Witharana, Department of Mechanical Engineering, Faculty of Engineering, University of Moratuwa

Funding - NFS Research Grant RG/2017/BS/05

02. Characteristics of Candida species isolated from oral flora of cancer patients and the anti candida activity of selected medicinal plants in Sri Lanka

Candidate -AMDN Wanigasekara, Department of Biochemistry, Faculty of Medicine, University ofRuhuna

Principal Supervisor - Prof. MT Napagoda, Department of Biochemistry, Faculty of Medicine, University of Ruhuna

Co-Supervisor - Prof. WMDGB Wijayarathne, Department of Microbiology, Faculty of Medicine, University of Ruhuna

Funding - NSF grant No: RG/2019/BS/02

03. Effects of herbal extracts; *Psidium guajava, Garcinia gummigata; Eryngium foetidum* and *Cinnamomum verum* on hyperglycaemia in Diabetes induced mouse models

Candidate - GMUD Wijenayake, Department of Pharmacology, Faculty of Medicine, University of Ruhuna

Principal Supervisor - Prof. S Jayasinghe, Department of Pharmacology, Faculty of Medicine, University of Ruhuna

Co-Supervisors - Prof. VP Bulugahapitiya, Department of Chemistry, Faculty of Science, University of Ruhuna

Prof. PLN Lakshman, Department of Food Science and Technology, Faculty of Agriculture, University of Ruhuna

Funding - Accelerating Higher Education Expansion and Development Program Development Oriented Research (AHEAD-DOR 05)

01.A one health approach: the epidemiology of methicillin - resistant Staphylococcus aureus isolated from humans, animals and animal products in southern Sri Lanka

Candidate - MRP Kurukulasooriya, Duke, Faculty of Medicine, University ofRuhuna, Karapitiya, Galle

Principal Supervisor - Prof. A de Silva Nagahawatte, Department of Microbiology, Faculty of Medicine, University of Ruhuna

Co-Supervisors - Prof. WMDGB Wijayaratne, Department of Microbiology, Faculty of Medicine, University of Ruhuna

Dr. LG Tillekeratne, Duke Global Health Institute (DGHI), Durham, USA

Prof. CK Bodinayake, Department of Medicine, Faculty of Medicine, University ofRuhuna

Prof. CW Woods, Duke Global Health Institute, Duke University, USA

Prof. T Ostbye, Duke Global Health Institute, Duke University, USA

Dr. D de Silva, Sir John Kotelawala Defence University, Rathmalana

Funding- UGC Block Grant No- RU/PG-R/16/03 & NRC Grant No 19-099

02.Delusional disorder (Jealous type): frequency of presentation to mental health services and web-based community survey on psychological mechanisms and psychosocial correlates of abnormal jealousy in intimate relationships

Candidate -MKOK De Silva, Department of Clinical Sciences, Faculty of Medicine, General Sir John Kotelawala Defence University, Ratmalana

Principal Supervisor - Prof. IH Rajapakse, Department of Psychiatry, Faculty of Medicine, University of Ruhuna

Co-Supervisors - Dr. MC Rajasuriya, Department of Psychiatry, Faculty of Medicine, University of Colombo

Dr. NFJ Fernando, Department of Clinical Sciences, Faculty of Medicine, General Sri John Kotelawala Defence University, Ratmalana

Funding - Self funded

03. Cardiovascular and psychological comorbidity among patients with plaque psoriasis

Candidate - PLAN Liyanage, Department of Community Medicine, Faculty of Medicine, University of Ruhuna

Principal Supervisor - Prof. S Lekamwasam, Department of Medicine, Faculty of Medicine, University of Ruhuna

Co-Supervisors - Prof. PV De Silva, Department of Community Medicine, Faculty of Medicine, University of Ruhuna

Prof. S Imafuku, Department of Dermatology, Fukuoka University, Japan

Funding - Pending

04. Development, characterization and bioactivity assessment of nano-encapsulated antidiabetic herbal drug leads from Sri Lankan flora

Candidate - WND de Silva, Department of Biochemistry, Faculty of Medicine, University of Ruhuna

Principal Supervisor - Prof. AP Attanayake, Department of Biochemistry, Faculty of Medicine, University of Ruhuna

Co-Supervisors - Prof. DN Karunarathne, Department of Chemistry, Faculty of Science, University of Peradeniya

Dr. KMGK Pamunuwa, Department of Horticulture and Landscape Gardening, Faculty of Agriculture and plantation Management, Wayamba University.

Dr. LDAM Arawwaala, Industrial Technology Institute, Colombo

Funding - Accelerating Higher Education Expansion and Development Program Development Oriented Research (AHEAD-DOR 15)

05. Formulation of evidence-based rehabilitation protocol for anterior shoulder pain: Evaluation of the effectiveness of myofascial release and kinesio taping in bicipital tendinopathy in patients attending the sports medicine clinic, Teaching Hospital, Karapitiya

Candidate - YHS de Silva, Department of Physiology, Faculty of Medicine, Galle
Principal Supervisor - Prof. S Gunawardene, Department of Physiology, Faculty of Medicine, University of Ruhuna
Co-Supervisors - Prof. TP Weerarathna, Department of Medicine, Faculty of Medicine, University ofRuhuna
Prof. MB Samarawickrama, Department of Anatomy, Faculty of Medicine, University ofRuhuna
Funding - Department of Education, Training & Research (ET&R) of the Ministry of Health (Pending)

06. An interventional study on the implication of integrated non-conventional therapeutic measures in the assessment of functional and psychological outcomes in athletes with iliotibial band syndrome

Candidate - S Thebuwanarachchi, Department of Physiology, Faculty of Medicine, Galle
Principal Supervisor - Prof. S Gunawardene, Department of Physiology, Faculty of Medicine, University of Ruhuna
Co-Supervisors - Prof. AS Dissanayake, Department of Medicine, Faculty of Medicine, University ofRuhuna
Prof. MB Samarawickrama, Department of Anatomy, Faculty of Medicine, University ofRuhuna Funding - Department of Education, Training & Research (ET&R) of the Ministry of Health (Pending)

07. Antidiabetic effects of nanoparticle based herbal nanoceutical formulations in Wistar rats induced with diabetes mellitus.

Candidate - ASD Wickramasinghe, Department of Biochemistry, Faculty of Medicine, University of Ruhuna
Principal Supervisor - Prof. AP Attanayake, Department of Biochemistry, Faculty of Medicine, University of Ruhuna
Co-Supervisor - Dr. P Kalansooriya, Department of Biochemistry, Faculty of Medicine, University of Ruhuna
Funding - Accelerating Higher Education Expansion and Development Program Development Oriented Research (AHEAD-DOR 15)

08. Promoting spontaneous reporting of adverse drug reactions in Teaching Hospital Karapitiya using manual reporting process and a mobile application

Candidate - MT Madushika, Department of Pharmacology, Faculty of Medicine, University of Ruhuna
Principal Supervisor - Prof. S Jayasinghe, Department of Pharmacology, Faculty of Medicine, University of Ruhuna
Co-Supervisors- Prof. PLGC Liyanage, Department of Pharmacology, Faculty of Medicine, University of Ruhuna
Dr. JA Jeewani, Department of Computer Science, Faculty of Science, University of Ruhuna
Funding - Faculty Research Grant

Dean's Awards 2021

Dean's awards are awarded annually to the students with the best overall performance in each Faculty. They are funded by the University and administered by the Deputy Vice Chancellor's Office in consultation and collaboration with the Faculties and assisted by the Division of Examinations and student affairs.

Dean's awards for 2021 were awarded the following students.

Dean's Award for the Best 2nd MBBS student of 2021

Mr. Mevan AJ Induruwa completed his education at St Thomas' College, Mt. Lavinia. He entered the Faculty of Medicine University of Ruhuna in 2018. Mevan passed the 2nd MBBS exam having received a first class with distinctions in all 3 subjects, Anatomy, Biochemistry and Physiology. He also won all his swimming events at the Inter Faculty and Inter-medical faculty level. Mevan's defining achievement in university swimming was when he won 5 Gold medals at the 13th Sri Lanka University Games in 2019 having broken the Sri Lanka University Records in all 5 events. He got selected to represent the Sri Lanka University Team at the 30th Summer World University Games held in Italy in 2019. He also was part of the Faculty scrabble team which came 2nd runners up at the Inter Medical Faculty Championships. Mevan showed his leadership skills in sport by being appointed as the Student Representative for the Sri Lanka Universities Association (SLUSA) in 2020. Thereby, he got the opportunity to become the moderator of the panel discussion held during the first ever International Day of University Sport (IDUS) celebrations held at the University of Kelaniya in 2020. In 2021, Mevan had the honor of being appointed as the FISU Student Ambassador for Sri Lanka, an honor that only two students from the entire country get each year. Mevan is also an avid speaker having participated at speech competitions, of which he was a semi-finalist at the All-island best gavel speaker competition in 2021. He has also been the compere at some faculty and other academically related events.

Dean's Award for the Best 3rd MBBS student in 2021

Miss HV Nethmi Yasara received her primary and secondary education at Southlands College, Galle and entered the Faculty of Medicine, University of Ruhuna in October 2016. She passed her second MBBS examination with a second class lower division and at the third MBBS examination she received a second class upper division with distinctions for parasitology and microbiology. From her first year at the Faculty of Medicine, she was an active member in both faculty and university chess events. She received colours from the Sri Lanka University Sports Association and the University of Ruhuna for her performances in chess in 2019. She has won colours as the best women's performer of the University of Ruhuna in chess twice, in the years 2017 and 2019. She was the Vice-Captain of University Chess team which became second runners up at the 13th Sri Lanka University Games in 2019. She was the Vice-Captain of the faculty chess team that placed first at the inaugural inter medical faculty championship. In 2021, she captained the University Women's chess team that became the first runners up at Inter university Championship. She also was the faculty captain for chess in 2020 and has played for Faculty of Medicine chess team that placed first at inter-faculty championships in 2017 and 2018 and has won awards for the best individual performances during those events. In addition to chess, she was a member of the Physiology quiz team that represented the Faculty of at Professor Carlo Fonseka Challenge Trophy 2019 and 17th Inter Medical School Physiology Quiz 2019 held in Jakarta, Indonesia. She was also a member of the faculty dancing team which performed in several faculty and university functions including Sri Lanka University Games inauguration ceremony and Faculty of Medicine Academic Sessions.

FMAS Winners of Free paper Sessions 2021

Best Oral Presentation in Open Category

Assessment of risk of relapse following institutional rehabilitation of males addicted to drugs in Sri Lanka: Survival Analysis approach

Presented by: Darshana ILAN
Authors: Darshana ILAN, Wijesinghe CJ, De Silva PV

Best Oral Presentation in Students' Category

Psychological well-being among Nursing Officers working in Teaching Hospital Karapitiya during COVID 19 pandemic in Sri Lanka

Presented by: Wijenayaka DA
Authors: Wickremasinghe VR, Wijayanthika PKD, Wijenayaka DA, Wijerathna AVMP, Wijesooriya WHGSD, Yasara HWN, Yasara PWI, Darshana ILAN

FMAS Winners of Poster Presentations 2020

Best Poster Presentation in Open Category

Recalled history' as an indicator of previous chickenpox infection among a sample of medical undergraduates at the University of Ruhuna

Presented by: Gunasena S
Authors: Gunasena S, Weerasinghe NP, Wijayaratne WMDGB, Nagahawatte ADeS, Wickramasinghe SS, Thabrew HHPMJ, Dharmasiri GNJ, Padmani JL

Best Poster presentations in Students' Category

Experience and perception on COVID control activities of Public Health Inspectors in Galle district during COVID-19 pandemic

Presented by: Peiris LMN
Authors: Peiris LMN, Oshada GAK, Pabasara MWM, Panditha KR, Pathirana MPTP, Pathirana WPRS, Paththuwage PAG, Liyanage PLAN

Changes in household food consumption patterns among residents of selected districts during COVID-19 pandemic

Presented by: Randeni RACA
Authors: Rajaguru MU, Rajapaksha RRMHM, Rajapaksha TN, Rajeendra YPH, Rajapura HRSD, Randeni RACA, Randeni RPSS, De Silva KKWJC, Rajakaruna VPC

Patterns and determinants of drug use and its effects among drug addicts in selected drug rehabilitation centres in Sri Lanka and factors affecting relapse after rehabilitation

Darshana I L A N[1], Wijesinghe C J[1], De Silva P V[1]

[1]Department of Community Medicine, Faculty of Medicine, University of Ruhuna, Sri Lanka

Abstract

Introduction

Illicit drug use is a significant public health problem in Sri Lanka. Health and social consequences due to drug use and relapses following rehabilitation are common among drug users. This study assessed the patterns and determinants of drug use and its effects among drug addicts in selected drug rehabilitation centres in Sri Lanka and factors affecting relapse after rehabilitation.

Methodology

The study consisted of two phases. In phase I, a cross-sectional survey was conducted to identify characteristics, patterns, determinants and adverse consequences of drug use and to assess the motivation for rehabilitation among a consecutive sample of 431 male illicit drug users in five selected rehabilitation centres in Sri Lanka. In Phase II of the study, a randomly selected sub-sample of 189 drug users was followed up for 6 months to assess relapse rate and follow up status after rehabilitation. Predictors of relapse were determined using a nested-case control study. Data were collected using interviewer-administered questionnaire.

Results

Heroin was the main addictive drug used and cannabis was the gateway drug for illicit drug users. Ninety-seven percent were addicted to illicit drugs and 71% had a problematic level of drug use. Exposure to abuse during childhood/ adolescence (OR=3.9, 95%CI=2.4 to 6.2, p<0.001), initiation of drug use in adolescence (OR=2.2, 95%CI=1.3 to 3.8, p<0.05), high income (OR=1.6, 95%CI=1.1 to 2.7, p<0.05) and being a non-manual worker (OR=2.5, 95%CI=1.1 to 6.5, p<0.05) were predictive of a high problematic level. A considerable proportion of drug users experienced adverse consequences on health (52.0%), legal status (86.3%), family relationships (83.5%), social relationships (78.4%) and employment (58.5%). Poor motivation for rehabilitation was observed in 23.7% of drug users. Relapse rates at three months and six months after rehabilitation were 48.7% (84.4% of all relapses) and 59.6%, respectively. Unsatisfactory financial status, unemployment and poor family relationships were common problems among rehabilitated drug users during follow up period. Alcohol/ tobacco use after discharge (OR= 5.1, 95% CI=6.2 to 36.7, p<0.001) and adverse social consequences (OR=0.3, 95% CI=0.1 to 0.9, p<0.0) were predictive of relapse.

Conclusions

Important aspects of illicit drug use behavior in Sri Lanka were identified through this study. These findings are useful for the policymakers and health care planners to plan and to implement preventive measures and develop better rehabilitation programs for drug users to make Sri Lanka a 'drug free' country.

Key words: Illicit drug use, drug addicts, risk factors, relapse rate

Introduction

Illicit drugs are defined as “psychoactive substances that the production, sale or use is prohibited with the prevailing legal system in a given country and for the long term on regular basis for a non-medical purpose” by World Health Organization. According to National Dangerous Drug Control Board (NDDCB),

heroin, cannabis, cocaine, opium, psychotropic drugs such as diazepam, tramadol, benzodiazepine, etc and hallucinogens such as ecstasy, Lysergic Acid Diethylamide (LSD), crystal meth, etc are common illicit drugs popular among Sri Lankan drug users. However, cannabis and heroin are the commonest illicit drugs that lead to a public health problem in the country.

Drug addicts come from all walks of life and many suffer from medical, mental, occupational, financial, legal, family and social problems. All of these problems render their addictive behaviour much more difficult to treat. Additionally, addiction increases the addict's risk to a wide variety of other illnesses(1). These may come about due to the toxic effects of the drugs or as a result of the poor living and health habits that are normally associated with the lifestyle and behavior of the addict.

Although treatment methods are available for drug addicts, many of them doubt that treatment can be effective. This may be due to their unrealistic expectations. They equate addiction with simply taking drugs and thus expect addiction to be cured quickly; otherwise, treatment is assumed to be failed. In reality, addiction is a chronic disorder; abstinence may be attained only with sustained and repeated episodes of treatment (2). Many addicts who enter treatment drop out well before receiving all the benefits that treatment can provide. As drug addiction is a chronic condition, successful treatment outcomes may require a long-term process involving multiple treatment interventions.

Relatively few studies have been carried out on drug addiction in the Sri Lankan setting and the limited research conducted nearly a decade ago describe the incidence and prevalence of drug use and behaviors and characteristics of drug users including common patterns of usage and risk groups (3,4). However, the rate of relapse after rehabilitation, risk factors and protective factors for relapses and effects on health and social well-being due to drug addiction among Sri Lankan drug addicts have not been studied so far. Further, no studies have been conducted to assess the level of motivation, the effectiveness of existing treatment and rehabilitation programmes for drug users, and the severity and burden of drug addiction. As this study covers a vast range of topics related to drug addiction, the findings of the study will be immensely helpful to the Government and the policymakers to develop policies and plan preventive strategies to overcome the problems of drug addiction in Sri Lanka.

Methodology

This study was conducted in two phases. To conduct the study, ethical approval was obtained from the Ethical Review Committee, Faculty of Medicine, University of Ruhuna, Sri Lanka (Ref. No 11.07.2016:3.13). Permission for the data collection was obtained from the Chairman of the National Dangerous Drug Control Board, Sri Lanka. Written informed consent was obtained from all participants after explaining the purpose and objectives of the study.

Phase I

A cross-sectional study was conducted to identify characteristics, patterns and determinants of drug addiction, to identify common effects on health and social wellbeing due to drug addiction and to assess the level of motivation for rehabilitation among 431 institutionalized male drug addicts in Sri Lanka. Almost all treatment admissions (>99%) into rehabilitation centres made in Sri Lanka were males and hence male drug users were included for the study. Study subjects were selected from five selected rehabilitation centres; Mith Sevana – Galle, New life rehabilitation centre – Galle, Meth Sevana – Kandy, Seth Sevana – Koswaththa and Nawadiganthaya – Nittambuwa. Data were collected using a judgmentally validated interviewer-administered questionnaire which consisted of six components; General details, Details of drug use behaviour, patterns and addiction status, Sinhala version ICD 10 symptom checklist for substance use disorders to identify drug dependence, Sinhala version of Drug Abuse Screening Test 20 (DAST 20) to detect the problematic level of drug addiction, Sinhala version of Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES) to detect motivation level for rehabilitation and questions to assess the

experience of known consequences of illicit drug use on health and social wellbeing. Data were analyzed using SPSS (24th version). Association between variables were identified using chi square test and binary logistic regression at 0.05 significance level.

Phase II

There were two components in this phase of the study. In component A of phase II, a cross-sectional study with a follow-up component was conducted in a randomly selected sub-sample of 189 drug addicts recruited in the phase I of the study, who completed rehabilitation. The objective of this component was to identify health and social problems faced by them after discharge from the rehabilitation centres and to assess the effectiveness of existing treatment and rehabilitation programs for drug users including assessment of relapse rate. Following discharge from the respective rehabilitation centres, they were followed up for six months and interviewed at two time points (3 and 6 months). Data were collected during two follow-up interviews using the same questionnaire used in phase I. Information related to health and social problems faced by the drug users after discharge from the rehabilitation centres and status of relapse, service satisfaction regarding rehabilitation and follow-up status were assessed in the questionnaire. The relapse rate was calculated at 3 months and 6 months following discharge.

In component B, a nested case-control study was conducted to identify possible risk factors and protective factors for relapses after drug rehabilitation. A drug user who had been discharged from the selected drug rehabilitation centres after completion of rehabilitation (three months' rehabilitation course) and found to have relapsed during the follow-up period of six months was defined as a 'case' and a drug user who had no relapses within a period of six months after discharge was defined as a 'control'.

Out of the 189 drug users participated in component A, six were lost to follow up and one death was reported. After applying the inclusion and exclusion criteria, 182 drug users were selected for the nested case-control study, which included 108 drug addicts with relapse (cases) and 74 drug addicts without relapse (controls). To ascertain the presence or absence of the selected risk factors, data on the relevant independent variables were extracted retrospectively from the questionnaires used in phase I and phase II (component A). The two groups (cases and controls) were compared to assess risk/protective factors for relapse using bivariate and multivariate analysis. Chi square test was used to identify the statistical significance of associations between variables at the significance level of 0.05. The variables that showed significant associations in the chi-square test were included as independent variables in the multivariate analysis. All analyses were done using SPSS (Version 24.0) statistical software.

Results

A total of 431 male illicit drug users from five selected rehabilitation centres participated in the phase I of the study. There were no non-respondents and the response rate was 100.0%. A majority of the drug addicts in the study sample were Sinhalese (82.4%) and Buddhists (70.5%) with a mean age (SD) of 32 (10) years. While Heroin was the main addictive drug used, cannabis was the gateway drug for illicit drug users. Approximately 68% initiated drug use as an experiment, introduced by friends (87%) and 6.3% were intravenous drug users.

Of the sample, 97% were addicted to illicit drugs and 71% had a problematic level of drug use. Having a history of exposure to abuse during childhood / adolescent (OR=3.9, 95% CI= 2.5 to 6.2, $p<0.001$), initiation of drug use in adolescence (OR=2.3, 95% CI=1.4 to 3.8, $p<0.05$), having a high income (OR=1.7, 95% CI=1.0 to 2.8, $p<0.05$) and being a non-manual worker (OR=2.5, 95% CI =1.0 to 6.5 $p<0.05$) were more likely to be associated with a high problematic level of drug use (Table 1). The age of the drug user, area of residence, duration of drug use and having a family history of drug use did not show statistically significant associations with the problematic level of drug use in multivariate analysis.

A considerable proportion of drug users experienced adverse consequences on their health status (52.0%), legal status (86.3%), family and social relationships (83.5% and 78.4% respectively) and employment (58.5%).

Poor motivation for rehabilitation was observed in 23.7% of the drug users. The drug users having higher problematic levels of drug use (OR=0.6, 95% CI=0.4 to 0.98, p<0.05) were less likely to have higher motivation level. Interestingly, awareness about adverse consequences of drug use (OR=1.8, 95% CI=1.1 to 2.8, p<0.05) was more likely to be associated with high motivation for rehabilitation. Age, marital status and duration of drug use did not have statistically significant associations with the problematic level of drug use in multivariate analysis (Table 2).

The relapse rates among the drug users at three months and six months after rehabilitation were 48.7% (84.4% of all relapses) and 59.6% respectively. Unsatisfactory financial status, unemployment and poor family relationship were common problems experienced by the rehabilitated drug users during follow-up period. Use of alcohol and tobacco after discharge was identified as a risk factor (OR=15.2, 95% CI=6.2-36.8, p<0.001) and experiencing social problems after drug use emerged as a protective factor (OR=0.3, 95% CI=0.1-0.98, p<0.05) for relapse in multivariate analysis (Table 3).

Associated factor	Problematic level of drug use		Total N (%)	OR (95% CI)	Significance
	Low n (%)	High n (%)			
Age Category					
< 25 years(R)	42 (36.2)	74 (63.8)	116 (100.0)	1.4 (0.7 to 2.8)	p = 0.315
25 years and above	83 (26.3)	232 (73.7)	315 (100.0)		
Area of residence					
Western province	82 (25.2)	244 (74.8)	326 (100.0)	1.4 (0.8 to 2.5)	p = 0.171
Outside of Western province(R)	43 (40.9)	62 (59.1)	105 (100.0)		
Income category					
No income and < Rs. 50,000 (R)	59(35.3)	108(64.7)	167(100.0)	1.6 (1.1 to 2.7)	p = 0.040*
Rs. 50,000 and above	66(25.0)	198(75.0)	264(100.0)		
Occupational status					
Unemployed(R)	14(50.0)	14(50.0)	28(100.0)	-	-
Manual workers	58(33.1)	117(66.9)	175(100.0)	1.3 (0.4 to 3.4)	p = 0.584
Non-manual workers	53(23.2)	175(76.8)	228(100.0)	2.5 (1.1 to 6.5)	p = 0.050*
Duration of drug use					
< 10 years(R)	74(54.0)	137(46.0)	211(100.0)	1.1 (0.5 to 1.8)	p = 0.976
10 years and above	51(23.1)	169(76.9)	220(100.0)		
Age of first drug use					
<18 years	48(21.7)	137(78.3)	221(100.0)	2.2 (1.3 to 3.8)	p = 0.001*
18 years and above(R)	77(36.7)	133(63.3)	210(100.0)		
Family history of drug addiction					
Yes	34(21.8)	122(78.2)	156(100.0)	1.5 (0.9 to 2.5)	p = 0.110
No	91(33.1)	184(66.9)	275(100.0)		
Exposure to abuse					
Yes	51(18.4)	226(81.6)	277(100.0)	3.9 (2.4 to 6.2)	p <0.001*
No	74(48.1)	80(51.9)	154(100.0)		

R- Reference category * Statistically significant

Table 2: Associated factors of motivation level for rehabilitation among drug users (N=431)

Associated factors of motivation level for rehabilitation	Motivation level for rehabilitation		Total N(%)	OR(95% CI)	Significance
	High (n=229) n(%)	Low (n=202) n(%)			
Age Category					
<25 years(R)	45(38.8)	71(61.2)	116(100.0)	0.5(0.3 to 1.1)	P=0.051
25 years and above	184(58.4)	131(41.6)	315(100.0)		
Marital Status					
Unmarried/divorced/ separated/Widowed	134(49.4)	137(50.5)	271(100.0)	1.2(0.8 to 1.9)	P=0.251
Married/ Living together(R)	95(59.4)	65(40.6)	160 (100.0)		
Duration of drug use					
< 10 years (R)	97(45.9)	114(54.1)	211(100.0)	0.8(0.4 to 1.3)	P=0. 439
10 years and above	132(60.0)	88(40.0)	220(100.0)		
Problematic level of drug use					
Low (R)	52(41.6)	73(58.4)	125(100.0)	0.5(0.3 to .0.8)	P=0.010*
High	177(57.8)	129(42.2)	306(100.0)		
Awareness on adverse consequences of drug use					
Yes	64(62.7)	38(37.3)	102(100.0)	1.7(1.1 to 2.8)	P=0.017*
No (R)	165(50.1)	164(49.9)	329(100.0)		

R- Reference category * Statistically significant

Follow-up status after discharge from the rehabilitation centres, service satisfaction of client during rehabilitation and after discharge from the rehabilitation centres and having a history of previous rehabilitation had no statistically significant associations either as a risk factor or protective factor in multivariate analysis

Discussion

Research evidences have great impact on the policymaking process related to illicit drug use prevention within the country. This study sought to fill many gaps related to the illicit drug use in the local context, in comparison to the wealth of knowledge available in regional and global contexts. Hence, the first phase of the study a descriptive, cross-sectional study was conducted to identify the patterns, characteristics and determinants of drug addiction and possible adverse consequences on health and social wellbeing due to drug use among 431 male drug addicts who come in contact with reporting institutions in Sri Lanka. Further, it was noted that the numbers of drug addicts who end up with relapse and readmissions to rehabilitation centers are high in the country. Hence, the motivation level for rehabilitation was also assessed in the first phase of the study.

In the second phase of the study, a subsample of 189 drug addicts who participated in phase I of the study was followed up under two components. In the first component, a descriptive survey was conducted to assess the relapse rate, follow up status and effectiveness of rehabilitation programs. In the second component, the trigger factors for relapse among male drug addicts who come in contact with reporting institutions were assessed in a nested case-control study.

Table 3: Risk and protective factors for relapse among drug users (n=182)

Factor related to rehabilitation	Relapse status		Total Number (%)	OR (95% CI)	Significance
	Not relapsed (n=74)	Relapsed (n=108)			
	Number (%)	Number (%)			
Follow up status after discharge from rehabilitation center					
Regular (R)	49 (49.5%)	50 (51.5%)	99 (100.0%)	-	
Irregular	23 (38.3%)	36 (61.7%)	60 (100.0%)	1.6(0.7 to 3.7)	p=0.256
No follow up	2 (8.3%)	22 (91.7%)	24 (100.0%)	3.1 (0.2 to 42.8)	p=0.416
Service satisfaction during rehabilitation					
Satisfied (R)	72 (43.1%)	95 (56.9%)	167 (100.0%)	0.7 (0.1 to 10.1)	p=0.858
Not satisfied	2 (13.3%)	13 (86.7%)	15 (100.0%)		
Service satisfaction after discharge from the rehabilitation center					
Satisfied (R)	70 (46.4%)	81 (53.6%)	151 (100.0%)	2.1 (0.2 to 17.3)	p=0.464
Not satisfied	4 (12.9%)	27 (87.1%)	31 (100.0%)		
History of previous rehabilitation					
Yes	16 (29.1%)	39 (70.9%)	55 (100.0%)	1.8 (0.7 to 4.3)	p=0.159
No (R)	58 (45.7%)	69 (54.3%)	127 (100.0%)		
Use of alcohol and tobacco after discharge					
Yes	30 (23.3%)	99 (76.7%)	129 (100.0%)	15.1 (6.2 to 36.7)	p<0.001*
No (R)	44 (83.0%)	9 (17.0%)	53 (100.0%)		
Problems in social relationships following drug use behavior					
Yes	65 (44.8%)	80 (55.2%)	145 (100.0%)	0.3 (0.1 to 0.9)	p=0.046**
No (R)	9 (24.3%)	28 (75.7%)	37 (100.0%)		

R –Reference category Statistically significant at * 0.001 and ** 0.05 level

By analyzing this information, it is expected to draw the attention of policymakers and health program planners who are responsible for making preventive interventions related to illicit drug use within the country

Types of illicit drug use throughout the world showed a geographical heterogeneity (5-8). However, within the region, it showed geographical homogeneity 9). The present study results showed some disparity with the global and regional patterns of illicit drug use. In our study, we identified heroin as the main dependent drug for most of the drug users. However, according to NDDCB, cannabis was the most abused illicit drug in Sri Lanka and among the prison population of Sri Lanka majority had used cannabis compared to heroin (4). Cannabis is considered as less addictive and problematic drug compared to heroin (8) and drug addicts who use cannabis give less priority for rehabilitation compared to heroin users (10). Moreover, Sri Lanka is a transient point for heroin trafficking in the world and cannabis is cultivated within the country or transported from the Kerala region leading to easy availability at a low price compared to other illicit drugs (8). This could be considered as reasons for recognition of these drugs as main two problematic illicit drugs in Sri Lanka.

Drug dependence was identified among 97.0% of illicit drug users according to ICD 10 symptom checklist for substance use disorder in this study. Usually, drug addicts seek the help of a rehabilitation program when they understand that the cessation of drug use is impossible on their own. Therefore, there is no wonder that a higher proportion with drug dependence was seen among the drug addicts in rehabilitation centers. However, the few drug users who did not have drug dependence were admitted

through the criminal justice system without a proper assessment of their drug use behavior or addiction status. It may cause overcrowding of the drug rehabilitation system in the country, limiting opportunities for drug users who actually require rehabilitation.

Further, during the assessment of problematic drug use using DAST 20, the majority of the drug users (54.1%) demonstrated substantial problematic levels, while 29.0% (low and moderate problematic levels) could be managed as an outpatient client(11). Therefore, a significant number of drug users had unnecessary admissions according to American Society of Addiction Medicine (ASAM) criteria causing overburden of the rehabilitation system of the country. However according to the literature, it is not sufficient to decide on admission entirely based on problematic level of drug use as it might be necessary to consider other drug-related factors, socio-demographic factors and vulnerable factors for drug use (11).

Adverse consequences on health were reported by 52.0%, while consequences on legal status (86.3%), family relationships (83.5%), social relationships (78.4%) and employment (58.5%) were also found in significant proportions according to the overview of DAST- 20. These findings are compatible with the reports of the United Nations Office on Drug and Crime (UNODC) (8). However, detailed information regarding adverse consequences of health and social wellbeing following illicit drug use were not available in the Sri Lankan context to compare with present study results.

In the present study, SOCRATES was used to assess the motivation level for rehabilitation since it was identified as the most suitable tool after a review of literature. It was found that a significant number of drug addicts had lack of motivation to change their drug use behavior to engage in the rehabilitation process. According to the published sources, the level of motivation for rehabilitation varied across different settings. Battjes et al., (12) reported a low motivation level, while Nosyk et al., (15) observed 52% of opioids dependents had a high level of motivation for rehabilitation. However, Fauziah and co-researchers in 2010 found that the majority of drug addicts had a high motivation for change in recognition and taking steps while a low motivation level related to ambivalence (13).

Leon et al., (14) found that initial motivational status and readiness for change affect the retention in rehabilitation as well as good prognosis after rehabilitation of drug addict. On the contrary, Nosyk et al., (15) found that retention in rehabilitation or discontinuation of rehabilitation process did not depend on baseline motivational status. However, a high level of motivation showed a more positive response to rehabilitation according to Nosyk et al. (15). Use of different assessment tools by two researchers to assess motivation may have contributed to this discrepancy. However, in the present study, no statistically significant association was observed between initial motivational level and relapse after discharge from the rehabilitation centres.

Lack of motivation related to ambivalence was identified as an important factor for poor outcomes in rehabilitation study findings also suggests paying special attention to overcome ambivalence among drug addicts by giving moral and social support and helping them to maintain continuous drug-free status.

Motivation to change is a complex process based on individual behavior (16). Although most drug addicts expect to stop their drug use behavior, it is a question whether they really want to do so. This is supported by the fact that many drug addicts who entered into rehabilitation process through enforcement by family or through legal system showed a high rate of readmission and ended up with relapse following rehabilitation (3), a finding confirmed by this study. According to DiClemente et al. (16) and Prochaska and DiClemente (17) motivation level can be changed through rehabilitation activities during the rehabilitation process. Although the initial motivation level was measured in this study, assessment of motivation level at discharge from the rehabilitation centres could be more valuable as an important indicator to assess the effectiveness of the rehabilitation process in order to minimize relapses. However, as the

considerable number of drug addicts had a lack of motivation for rehabilitation in this study, attention should be directed towards policymaking to incorporate activities into rehabilitation programs that improve motivational levels among drug addicts.

When considering the follow-up process, the number lost to follow-up was minimal (none within the first 3 months and 6 in the second 3-month period). Maximum effort was taken to minimize loss to follow up during the follow-up phase using a multidisciplinary approach with the help of the staff in rehabilitation centres, outreach officers and family members. Unfortunately, a considerable relapse rate was observed at the end of the follow-up process (48.67% at 3 months, 59.56% at six months excluding those lost to follow-up). The majority (84.4%) of the drug addicts who ended up with a relapse have relapsed within the first three-months after discharge from rehabilitation centres with a less than three-month mean time to relapse with a varying relapse rate was observed among selected rehabilitation centres at 3 months as well as at 6 months' follow-up period. However, the numbers recruited from respective rehabilitation centres also varied and it could affect the representativeness of the sub sample in terms of relapse rate.

As a high relapse rate (nearly 60%) was detected during the first six-month period after discharge from the rehabilitation centres, there is an uncertainty about the effectiveness of rehabilitation process. However, in keeping with our study, a high relapse rate is common throughout the world according to literature in keeping with our study and the rates range from 30.4% with nearly two-year mean time to relapse to 87% within 2 years after rehabilitation (18). However, direct comparisons between relapse rates among studies are difficult due to variations between rehabilitation programs in different countries and the duration after discharge from rehabilitation centres at the time of assessment. However, mean duration to relapse can be used to some extent for comparison among studies. According to the above findings, it is clear that many drug addicts end up with relapse following rehabilitation with a short mean time to relapse, as confirmed by this study. However, this study also identified that the first lapse to illicit drug use usually did not herald a full-blown relapse to dependent use and it had variations with time comparable to the study done by Gossop et al.(19).

In this study, only a few drug addicts have suffered from health and legal problems after discharge from the rehabilitation centres whereas unsatisfactory financial status, unemployment and poor relationship with family were identified in significant proportions during the follow-up period. According to Yang et al. (20), adverse socioeconomic conditions, poor family/social support, interpersonal conflicts, and stigma and discrimination were identified as main adverse consequences and these findings were compatible with our study to some extent. However, as the extent and mechanisms of follow-up varied among drug addicts after discharge from the rehabilitation center, adverse consequences may have varied among this study sample.

Interestingly, despite a high relapse rate, many drug addicts were satisfied with the service they received during rehabilitation (92.1%) and after discharge from the rehabilitation center (83.1%). The above findings were compatible with the study done by Keith (21). However, 55.6% of the clients had regular follow up and the majority experienced a lack of home visits (82.5%) for follow-ups. This emphasizes the importance of proper follow up of drug addicts in their own setting rather than at rehabilitation centres and using telecommunication. Hence, a better discharge plan could be developed for each and every drug addict at the point of discharge from the rehabilitation centres involving a multidisciplinary team to obtain a better outcome of the rehabilitation program.

In the present study, the use of alcohol and tobacco after discharge was identified as a risk factor for relapse in multivariate analysis (OR=15.2 , 95% CI=6.2 to 36.8, $p<0.001$), in keeping with the published literature (22-24) The experience of adverse consequences in social relationships was identified as a protective factor (OR=0.3, 95% CI=0.1 to 0.98, $p<0.05$) in keeping with existing evidence

(25,26) in multivariate analysis. Service satisfaction of the client during rehabilitation and after discharge from the rehabilitation centres and having no previous history of rehabilitation did not emerge as risk or protective factor in multivariate analysis. Moreover, many trigger factors for relapse identified in the literature were not identified as trigger factors in this study (27-30). Most of the possible trigger factors for relapse are interrelated and that may be the reason for the observed non-significance of associations during multivariate analysis.

Conclusions and Recommendations

Drug use behavior shared a geographical homogeneity within the country. Heroin was the main dependent drug. Problematic level of drug use varied within the sample. Exposure to abuse during childhood/adolescence, initiation of drug use in adolescence, having high income and being a non-manual worker emerged as the determinants of problematic illicit drug use. Adverse consequences following illicit drug use were common and it had a greater effect on health and social wellbeing of drug users. A majority had inadequate motivation and motivational level varied with their socio-demographic back ground and drug-related factors. Problematic level of drug use and awareness about adverse consequences of drug use were predictors for motivation. Relapse was observed in nearly 60% at six months. Majority were relapsed during a very short period after discharge from rehabilitation centres. Use of alcohol and tobacco after discharge was a risk factor for relapse whereas the experience of adverse consequences in social relationships was a protective factor.

The study recommends the need of considering the rehabilitation process at the individual level as characteristics, patterns, determinants, problematic level, addiction level and motivation level for rehabilitation vary among the drug addicts, although overall picture of drug use showed a geographical homogeneity within the country. DAST 20 and SOCRATES were identified as important tools for management of drug addicts and hence study recommends to implement these tools in the rehabilitation process of drug addicts.

As many drug addicts reported adverse consequences following illicit drug use, it is recommended to develop a proper assessment system to screen drug addicts and to identify these adverse consequences early. Further, a referral system should be incorporated into the rehabilitation process not only for health problems but also for family and social problems, employment problems and legal problems.

As a high relapse rate was observed, the study recommends the need of supervising and monitoring the rehabilitation process even after discharge from rehabilitation centres with the help of a supportive network including the staff of rehabilitation centres, family members of drug addicts, social workers and the community. The introduction of discharge plans at an individual level according to the socio-demographic background of the drug addicts is recommended before discharge. Hence the study recommends the need for a proper follow-up plan at the individual level targeting home visits.

Lack of research studies related to illicit drug use in the local context was noted although many were available in global and regional contexts. Hence, further research studies are recommended to identify gaps related to illicit drug use in the local context in order to plan and implement better rehabilitation programs to make Sri Lanka a drug free country.

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Pulmonary Function Test Abnormalities in Patients with Rheumatoid Arthritis; A Single Center Study at a Teaching Hospital in Sri Lanka

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Abstract

Introduction

Pulmonary diseases are common extra-articular manifestations of rheumatoid arthritis (RA) and account for high disease related mortality. Pulmonary function tests (PFTs) are considered one of the cost-effective options for early identification of pulmonary involvement in RA.

Objectives

The objective of this study was to assess the prevalence of PFT abnormalities and its associated factors among diagnosed patients with RA visiting a tertiary care hospital in Sri Lanka.

Methods

A cross-sectional study was conducted recruiting 42 consecutive RA patients attending the rheumatology clinic of Teaching Hospital Karapitiya, Galle, Sri Lanka in the year 2018-2019. Data were collected using an interviewer-administered questionnaire. Lung functions were measured using spirometry. Mann-Whitney U test, Spearman's rho and Kruskal Wallis H test at 0.05 significance level were used to identify associations between variables.

Results

Out of all the patients (N=42), 57.1% showed abnormal PFT results. Among them, Obstructive defect was noted in 16.6%, small airway defect in 37.5%, and pure restrictive defect in 45.9%. No patients with combined restrictive and obstructive diseases were detected. A statistically significant association of forced vital capacity (FVC) with the presence of respiratory symptoms (p=0.02) was detected. Statistically significant negative correlations were reported between PFR and age (r^s = -0.371, p= 0.01) and peak expiratory rate (PFR) and disease activity (r^s = -0.393, p = 0.01). Age, duration of the disease, severity, and presence of respiratory symptoms did not show an association with types of respiratory abnormalities.

Conclusion

PFT abnormalities were detected in a considerable proportion of RA patients. PFTs should be performed in patients with RA, irrespective of the duration and the severity of the disease or respiratory symptoms.

Keywords

Rheumatoid arthritis, pulmonary involvement, pulmonary function tests

Introduction

Rheumatoid arthritis (RA) is a chronic multisystem disease of autoimmune nature, characterized by both articular and extra-articular manifestations. Pulmonary manifestations occur due to the involvement of airways, lung parenchyma, pleura, or pulmonary vasculature which altogether accounts for around 60-70% of prevalence among the RA population.[1] The lung involvement follows the articular disease and usually manifests within five years since the onset of symptoms, but sometimes it could be the first manifestation of RA.[2,3] It is found that around 15% of RA related mortality is due to lung disease with interstitial lung disease (RA-

ILD) being the commonest.[4,5] Airway involvement in RA mainly includes bronchiolitis, bronchiectasis, airway hyper-reactivity, obstructive small airway disease, and cricoarytenoid disease.[1]The reported prevalence of airways disease in RA is 39% to 60%[6-8]while it was highly variable for RA-ILD due to extensive heterogeneity among studies. Further, research done based on pulmonary function tests (PFTs) found that small airway defects defined by low forced expiratory flow (FEF) 25-75% are more common among RA patients.[7-9] Diagnosing and treating RA-lung disease has assumed more significance since drugs such as mycofenolatemofetil (MMF) and rituximab are now being used in treating them.[10-12]

High-resolution computed tomography (HRCT) is currently recognized as the most sensitive investigation in diagnosing rheumatoid lung disease.[1, 10] HRCT is not available widely and is costly. Therefore, it is important to find a cheaper and relatively widely available investigation to screen patients with RA to identify those who need HRCT. PFT, especially spirometry, is one such investigation that can help diagnose possible lung involvement and recommend further investigations. In a clinical setting, history and examination are usually used to identify patients who need further investigations. Besides, symptoms like exertional dyspnoea are difficult to assess in patients with activity-limiting joint disease.

Studies conducted to look for the possible risk factors have found a positive relationship of RA-ILD with advanced age, smoking, use of methotrexate (MTX), disease severity, disease duration, and a score calculated according to joint involvement on plain x-rays named "Larsen score".[13,14] Contrary to this, some studies could not prove any relationship with the risk factors mentioned above.[15, 16] For these studies done to determine the relationship, they have used PFTs together with radiological studies while most of the recent studies used HRCT as the indicator of lung involvement.[13-16] There was no Sri Lankan study based on PFTs to assess pulmonary involvement in RA. The objectives of this work were to assess the prevalence of PFT abnormalities among RA patients visiting the Rheumatology clinic in a tertiary care hospital and to evaluate their relationship with clinical characteristics.

Methods

Patient recruitment

A cross-sectional study was conducted in the Department of Physiology, Faculty of Medicine, Karapitiya, and the Rheumatology Clinic of TH Karapitiya among 42 consecutive patients attending from October 2018 to December 2019 and diagnosed with Rheumatoid arthritis using 2010 ACR/EULAR Criteria[17] were included in the study. The informed written consent was obtained from the patients by the principal investigator who is not involved in patient management at the clinic. The patients were informed that refusing to participate in the study would not affect their management and that they could consider withdrawing at any stage.

Patients suffering from long-term chronic lung diseases that have no apparent clinical relationship to RA, patients with occupational exposures known to cause ILD, patients with coexisting connective tissue disorders, patients on any drug that may cause lung involvement other than prescribed drugs for rheumatoid arthritis, and pregnant and lactating mothers were excluded from the study. Ethical clearance was obtained from the Ethical Review Committee, Faculty of Medicine, University of Ruhuna.

Clinical assessment

An interviewer-administered questionnaire was used to collect sociodemographic and disease-related information from patients. Duration of the disease, disease-modifying drugs, smoking history with pack years (one pack-year = 20/day for one year) and respiratory symptoms, current symptoms and signs of joint involvement, ESR (noted from clinic information) were documented under disease-related information. The patient's self-assessment of global health was documented to calculate the DAS28 disease activity score. Using DAS 28 scoring system disease activity

Pulmonary function tests

A standard spirometer (Spirolab III, Italy) was used for studies of lung function. The tests were performed in the sitting position and the forced expiratory manoeuvre was repeated three times and the best or the highest readings were documented. Lung function studies mainly including forced vital capacity (FVC), forced expiratory volume in the first second (FEV1), FEV1/FVC ratio and forced expiratory flow from 25% to 75% of FVC (FEF25–75) which is a specific index of small airway function and Peak expiratory flow (PEF) were measured. All spirometry assessments were performed and interpreted in the Department of Physiology, Faculty of Medicine, University of Ruhuna.

Based on the results of the PFTs, five groups were defined: Group 1:Normal PFT Group 2: obstructive airways disease as defined by low FEV_1/FVC ratio, Group 3: small airways involvement as defined by low FEF25–75% ratio in the absence of reduced FEV_1/FVC ratio and absence of restrictive syndrome, Group 4: restrictive defect as defined by low FVC with a normal FEV_1/FVC ratio expressed in percentages, and Group 5: a combined pattern defined as the coexistence of airway obstruction and restrictive syndrome. PFT abnormalities were categorized as abnormal if values were <70% of the predicted values adjusted for age, sex, and height.

Statistical analysis

Data were entered into an excel worksheet and analyzed using the SPSS software (21st version). The FEV1, FVC, FEF 25–75%, and PEF were expressed as the percentage of the predicted values for each individual's age, sex, and height. Normality assessment was done before data analysis. The mean (SD) and median (IQR) were calculated for FVC, FEV1, FEF 25-75%, and PEF within each category for disease duration and disease severity. Further, similar calculations were done for age, disease duration, and disease severity within each type of respiratory abnormality. Mann-Whitney U test was used to compare the spirometric median values between the two groups of presence and absence of symptoms. A similar analysis was done between early and late diseases. Kruskal Wallis H test was used to compare the medians of age, disease duration, and disease severity between respiratory abnormalities. The correlation of spirometric parameters with age, disease duration, and disease severity was assessed using Spearman's rho. The level of significance was considered as 0.05. In order to assess the adequacy of the sample, a post hoc power calculation was done using a standardized compute achieved power analysis calculator.[18]

Results

Characteristics of the study population

A total of 42 diagnosed RA patients attending the Rheumatology clinic, Teaching Hospital Karapitiya full filling the 2010 ACR/EULAR Criteria for RA were recruited to the study. Approximately 86% were females (n=36). The mean age (SD) of the participants was 57.7 (8.2) years, with an age range between 38 - 75 years. 9.5% of patients (n=4) were past or present smokers with one having a history of fewer than ten pack-years of smoking and the other 3, 10-19 pack-years of smoking. Nearly 57% (n=25) of patients complained of respiratory symptoms and among them, 80 % (n=20) had mild exertional shortness of breath while only one patient complained of moderate shortness of breath at exertion. A minority of patients (n=4, 16.0%) complained of dry cough. No other respiratory symptoms were reported. The mean duration (SD) of articular disease at the time of the study was 8.4 (7.6) years. The majority of the patients (n=31, 73.8%) were on MTX at the time of participating in the study. Disease activity was calculated according to DAS-28 criteria and the mean (SD) value for the study population was 3.26 (0.76). Among the participants, 14.3% (n=6) were in disease remission, 31% (n=13) had low disease activity and 54.8% (n=23) had moderate disease activity. Duration of disease, duration of treatment, ESR values, and DAS28 score were assessed under RA characteristics of the study sample (Table 1).

The FEV1, FVC, FEF 25–75%, and PEF were expressed as the percentage of the predicted values for each individual's age, sex, and height under the spirometric parameters of the study sample. Mean (SD) and median (IQR) were calculated for FVC, FEV1, FEF 25–75%, and PEF (Table 2).

Description of PFT abnormalities

Out of all the patients (n=42), 57.1% (n=24) showed abnormal PFT results; obstructive defect (FEV1/FVC <70%) in 9.5% (n=4), small airway defect (FEF 25-75 <70% without obstructive or restrictive disease pattern) in 21.4% (n=9) and pure restrictive defect in 26.2% (n=11). However, there were no patients with combined restrictive and obstructive diseases.

Respiratory symptoms and PFT

The spirometric parameters were compared with the presence or absence of respiratory symptoms using Mann Whitney U test. A statistically significant association was found between low FVC and having respiratory symptoms while no association was found with FEV1, FEF 25-75%, or PEFR with respiratory symptoms.

The majority (57.1%, 12 out of 21) of patients with breathlessness showed respiratory abnormalities and among them 50% (n=6) had restrictive lung defects while 41.6% (n=5) had small airway defects. Among the four patients with non-productive cough two had small airway defects and the remaining two had restrictive defects. However, there was no significant association of either of the above symptoms with the type of respiratory abnormality.

Rheumatoid arthritis characteristics and PFT Abnormalities

Nine out of 13 patients (69.3%) with low disease activity had respiratory abnormalities while thirteen (56.5%) patients with moderate disease activity showed abnormal tests. There was no statistically significant difference of the type or respiratory abnormalities with disease activity. Moreover, it was found there was no statistically significant association of any of the PFT abnormalities with disease duration. It was unable to demonstrate any significant correlation of FVC, FEV1 or FEF25-75% with patient's age, disease duration or disease activity except a significant negative correlation between PFR with age (r_s = -0.371, p= 0.01) and disease activity (r_s = -0.393, p = 0.01) (Table 3).

Table 1: RA characteristics of the study sample (n=42)

Characteristics	Median	Inter quartile range	
		25th	75th
Duration of disease(years)	6.0	4.0	9.0
Duration on treatment, (years)	6.0	4.0	9.0
ESR	20.0	15.0	35.2
DAS28	3.5	2.7	3.7

Table 2: Spirometric parameters of the study sample (n=42)

Spirometric parameter	Mean (SD)	Median	Inter quartile range	
			25th	75th
FVC (% predicted)	84.7 (16.2)	86.0	74.2	93.5
FEV1(% predicted)	82.9 (18.7)	83.0	74.5	96.5
FEF 25-75% (% predicted)	81.1 (35.7)	72.0	55.0	106.5
PEFR (% predicted)	83.8 (20.9)	87.5	70.7	95.7

FVC: Forced vital capacity, FEV1: Forced vital capacity in the first second, FEF 25-75%: from 25% to 75% of FVC, PEFR:Peak expiratory flow rate

Table 3: Correlation between age, disease duration, disease activity and PFT parameters (n=42)

	PFT parameters- % predicted spearman's rho correlation coefficient (p-value)			
	FVC	**FEV1**	**FEF25-75%**	**PEFR**
Age	-0.130 (0.41)	0.129 (0.41)	0.129 (0.41)	-0.371 (0.01)*
Disease duration	0.137 (0.38)	0.239 (0.12)	0.389 (0.48)	-0.096 (0.54)
Disease activity	0.211 (0.18)	-0.099 (0.53)	-0.049 (0.75)	-0.393(0.01)*

* Significant at 0.05 significance level

PFT Pulmonary function test, FVC: Forced vital capacity, FEV1: Forced vital capacity in the first second, FEF25-75%: from 25% to 75% of FVC, PEFR: Peak expiratory flow rate

Abnormal PFT and known risk factors

Among the 31 patients on Methotrexate, 41.9% (n=13) had normal pulmonary functions and 58.1%(n=18) had abnormal results. Eight of them had restrictive PFT results. However, none of these groups had a statistically significant difference (p= 0.688). Only 4 out of the 42 participants were smokers and only one of them showed abnormal PFT suggestive of an obstructive defect.

Post-hoc power calculation for the observed proportion of PFT abnormalities

After the primary analysis, a post-hoc power calculation has been done to detect the adequacy of the sample size. To calculate the power of the study for the observed proportion of PFT abnormalities, the post-hoc power calculation was conducted by adopting an error probability of 5% for the sample size used. The sample power (1-β error probability) was 0.94 and this confirmed the adequacy of the sample.

Discussion

In this single-centre study in 42 diagnosed patients with rheumatoid arthritis, the patients were assessed clinically and with spirometry. The study was mainly aimed at identifying the prevalence of PFT abnormalities and their association with symptoms, disease duration and disease activity.

Since there is wide variability in the definition of the disease, study population, study design, and diagnostic methods, the prevalence of PFT defects among RA patients shows poor consistency among the studies done in the past. However, PFT abnormalities are shown to be common among patients with RA.[19,20] In the present study, 57.1%, a high prevalence of patients showed defects in their PFTs. This is consistent with the previously reported 64% and 55.8% prevalences in Youssef et al.,2012[20] and Bilgici et al.,2005[21] respectively. Further, in this study, among the patients with PFT defects, the restrictive defects showed the highest prevalence (26.2%), which is a higher value compared to previous studies.[20] The prevalence of obstructive airway defect defined by low FEV1/FVC was 9.5%. There were no patients with a combination of the above two types of defects. Contrary to this, Youssef et al.,2012[20] found mixed restrictive and obstructive pattern as the commonest defect which has been reported in nearly 31% of their patients while only 22.1% showed pure restrictive defects.[19] However, in keeping with our study, Assadi et al., 2009[22] in a study done in Oman, found that 37.5% of the highest prevalence of PFT defects were restrictive in nature. The picture was different in studies where HRCT findings defined RA-ILD.

In a large population-based study conducted in the USA where they have based HRCT findings and compared with PFTs, clinically significant RA-ILD has been observed only in 8 to 10% of patients.[21] A Sri Lankan study done in a District General Hospital by Wickrematilake revealed the prevalence of ILD in RA was 14.6%.[23] However, in the latter study, HRCT was used for the diagnosis and patients were selected for HRCT after clinical assessment. Therefore, there is the possibility of not detecting patients without clinical features. Besides, findings on PFTs depend strongly on the patients' compliance and poor compliance would result in low FVC and FEV1 which is the pattern suggestive of a restrictive defect. Therefore, the

true number of patients with restrictive disease among our patients could be much less than detected. Further into this, the comparatively low prevalence of obstructive disease seen in our study could be due to the low percentage of smokers which is well proven to directly associate with airway disease.[1]

Interestingly, our study showed a 21.4% prevalence of small airway defects defined by low PEF 25-75% in the absence of an obstructive or restrictive defect. Therefore, the prevalence of small airway abnormalities was much higher than the obstructive airway disease defined by low FEV1/FVC. The small airways that extend from 8th generation airways have smaller internal diameters, less than 2 mm. However, their total cross-sectional surface area is much greater than that of large airways. Moreover, it is considered a "silent zone" where the disease can accumulate chronically over the years without manifestations. FEF 25-75% is considered to have a high sensitivity for such asymptomatic and symptomatic disorders of small airways.[24] In fact, Cortet et al.,1997[25] who reported 14 % of patients with small airway defects in his study population of RA found that it is the most common PFT defect.

Although this study demonstrated a statistically significant association of symptoms with FVC, no association was not detected between symptoms and restrictive defect or any other type of respiratory abnormality. Contrary to our findings, Youssef et al.,2012[20] found that respiratory symptoms such as dyspnoea and cough were predictive of an underlying lung abnormality detected by PFT.[19] However, a study done in New Zealand did not demonstrate any such association.[3]

We found a statistically significant correlation between PFR with age and disease activity. A similar correlation with age and disease severity in previous studies was reported [20]. However, our study showed no statistically significant association of any type of PFT defect type with duration or disease activity. In line with the present study, Perez et al.,1998[15] and Wilsher et al.,2012[3] did not demonstrate any significant relationship between airways involvement on PFTs and clinical or immunologic characteristics of RA. Contrary to this, Vergnenegre et al.,1997[26] have concluded that PFT abnormalities were affected by the duration of the disease and FEV1/FVC was also affected by the disease activity as well.Further into this, a large prospective cohort study done by Sparks et al.,2019[27] found that patients owith high or moderate disease activity, defined by DAS28, have a 2-fold increased risk of developing RA-ILD than those in remission or low disease activity. Since disease activity is a dynamic variable over the years, it is difficult to come to a conclusion by the disease activity of the patient at the time of the study. Therefore, further studies, especially longitudinal studies are important to assess the correlation of lung disease with variation in disease activity.

Our study has some limitations. We were unable to achieve the expected sample size of 76 due to the inability to perform lung function studies during the covid-19 pandemic. In addition, it was unethical to perform such studies with a high risk of contamination. Therefore, the analysis was performed with 42 participants who had undergone lung function tests before the pandemic. Therefore, the small sample size in our study would not have represented the whole RA disease population. In addition to this, patients were recruited from a rheumatology clinic from a tertiary care hospital could introduce some bias due to the selection of patients with advanced disease status than that of the overall RA population. However, disease activity was mild to moderate in a significant proportion of the included patients at the time of pulmonary assessment. Further, the lack of resources to perform more advanced pulmonary function studies such as plethysmography and carbon monoxide diffusion capacity has compromised the overall picture that PFTs could assess.

In conclusion, considering the above findings and research evidence from other studies, it is evident that asymptomatic patients could have significant abnormalities in their lung function tests. Furthermore, disease activity or duration have not shown a significant correlation with PFTs. In addition, the presence of symptoms could not determine their lung function abnormalities. Therefore, in order to identify the

patients with lung involvement, it is better to do a PFT during the early years of onset of the articular symptoms irrespective of their disease activity or pulmonary symptomatology. Since spirometry is the cheapest and most available study, it can be used as an initial step followed by HRCT, depending on the significance of the findings.

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Prevalence and molecular analysis of carbapenem resistance among clinical isolates of *Pseudomonas aeruginosa* in a tertiary care hospital

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Abstract

Introduction

Increased resistance to carbapenems among *Pseudomonas aeruginosa* has been reported worldwide. Carbapenem-resistant *Pseudomonas aeruginosa* (CRPA) has also been identified by the WHO as one of the three critical (priority1) pathogens. This study described the prevalence and antibiotic sensitivity pattern of *Pseudomonas aeruginosa* in clinical isolates and analyzed carbapenemase genes among CRPA isolates at Teaching Hospital Karapitiya (THK).

Methodology

The study was carried out from December 2018 to April 2019 at Teaching Hospital Karapitiya. Out of the clinically significant isolates suspected of *Pseudomonas*, 144 were confirmed as *Pseudomonas aeruginosa* by the Remel RapID™ NF Plus system. The antibiotic sensitivity testing for confirmed *Pseudomonas aeruginosa* isolates was performed using the CLSI's (2018) disc diffusion method. All the carbapenem-resistant isolates were further tested for metallo-β-lactamase production by imipenem/EDTA and imipenem/imipenem + EDTA tests. Molecular analysis of carbapenemases was performed by Gene-Xpert™ Carba-R Assay.

Results

Most were from respiratory isolates (n=51, 35.4%). Meropenem and imipenem demonstrated the highest sensitivities (n= 119, 82.6% each), while ticarcillin–clavulanate showed the least sensitivity (n=57, 39.6%). Amikacin was the most sensitive aminoglycoside (72.6%). Forty-two isolates (29.2%) were multidrug-resistant. The highest cross-resistance was to ciprofloxacin and the difference in resistance to ciprofloxacin between CRPA (100%) and carbapenem-sensitive isolates (28.4%) was statistically significant ($p < 0.0001$).
The prevalence of CRPA was 16% (n=23). Only 8 (35%) CRPA isolates demonstrated phenotypic metallo-β-lactamase production. Carbapenemase genes were detected in 74% (17/23). Carbapenemase genes were 64.7% NDM, 11.76% IMP-1, 11.76% VIM, and 11.76% co-harbored genes (NDM+VIM). There were no KPC producers. Carbapenemase producers were 100% resistant to ticarcillin-clavulanate, gentamicin and ciprofloxacin.

Conclusions

The prevalence of carbapenem resistance was 16%, and the predominantly isolated carbapenemase gene was NDM. As high levels of antibiotic resistance in *Pseudomonas aeruginosa* were detected, the choice of empirical antibiotic should be carefully considered and infection control measures have to be strengthened at the concerned healthcare facility.

Keywords: *Pseudomonas aeruginosa,* carbapenem resistance, carbapenemases

Introduction

Pseudomonas aeruginosa is a major opportunistic pathogen. It is a common cause of nosocomial infections and infections in immunocompromised hosts (1). Carbapenems are potent broad-spectrum β-lactam antibiotics, which are resistant to most β-lactamases. Thus, they are one of the limited options for multidrug-resistant (MDR) isolates. They are utilized for the treatment of severe and life-threatening infections.

Increased resistance to carbapenem had been reported among *Pseudomonas aeruginosa*

worldwide (2). In 2017, carbapenem-resistant Pseudomonas *aeruginosa* (CRPA) was identified by the World Health Organization (WHO) as one of the three critical (priority1) pathogens (3). Carbapenem resistance in *Pseudomonas aeruginosa* is due to an array of different mechanisms [4]. One such mechanism of acquired antibiotic resistance is the acquisition of carbapenemase genes such as genes for Metallo-β-lactamases (MBLs) and *Klebsiella pneumoniae* carbapenemase (KPC). As the MBLs can hydrolyze carbapenems efficiently, they are considered the most clinically significant mechanism of carbapenem resistance in *Pseudomonas aeruginosa*.

Carbapenem resistance is a global concern as the loss of such an antibiotic group will leave us with limited therapeutic options to treat MDR organisms including *Pseudomonas aeruginosa.* In addition, the last therapeutic options such as colistin are more toxic and expensive. Although the newer carbapenemase stable antibiotics are available, they are costly and not readily available for clinical use, especially in a developing country like Sri Lanka. Another concern regarding these carbapenemases is that they are carried by mobile genetic elements which make them readily transmissible (4). Such a transmission would be clinically troublesome as it can lead to outbreaks.

Regional studies had confirmed the presence of carbapenemases in neighboring countries like India and China (5,6). However, there had been hardly any detailed analysis of carbapenem resistance and the presence of carbapenemases among clinical isolates of *Pseudomonas aeruginosa* carried out in Sri Lanka to date. A study has identified the presence of NDM-1 in *Pseudomonas* species but the presence of other carbapenemases has not been identified (7). Thus, it is important to know the antibiotic sensitivity pattern and the prevalence of carbapenem resistance in Sri Lanka as a guide for empirical antimicrobial therapy. Furthermore, the knowledge of the prevalence of carbapenemases would be helpful in the implementation of infection control measures. Therefore, this study was carried out to fill the above-mentioned research gaps by investigating the prevalence of carbapenem resistance, the ABST pattern of *Pseudomonas aeruginosa* in clinical isolates, and the carbapenemase genes among carbapenem-resistant isolates of *Pseudomonas aeruginosa.*

Materials and Methods

The study was conducted at the Microbiology Laboratory of THK from the 10th of December 2018 to the 10th of April 2019 as a descriptive cross-sectional study. The ethical approval was obtained from ethics review committees of the Faculty of Medicine, University of Ruhuna, and the Medical Research Institute, Colombo 08.

Clinically significant, non–repetitive *Pseudomonas aeruginosa* isolates that were isolated from the clinical specimens that arrived at the microbiology laboratory of THK were included in the study. Blood, samples from sterile body sites, urine ($>10^5$ CFU and >1 pus cell / 7 HPF), pus aspirates, tissue cultures, good quality sputum samples (Murray and Washington's grading 3, 4, 5), good quality endotracheal aspirates and bronchoalveolar lavage fluid were included in the study. The laboratory manual by the Sri Lanka College of Microbiologists was referred to screen the clinical significance of the isolates (8). Isolates from wound swabs and the catheterized urine isolates were included only after verifying the clinical history from the bedhead tickets and the treating clinicians to exclude probable colonizers and contaminants.

The demographic and clinical data of the patients were collected using a data extraction sheet from the request forms and bedhead tickets. The medical officers were contacted when further clarifications were needed especially regarding the final diagnosis of the patients.

All the clinically significant *Pseudomonas* species (pale colonies or pigmentation on MacConkey agar with a positive oxidase test (with colonies from blood agar) and a non-reactive Kligler iron agar) were further identified to the species level using Remel™ RapID NF Plus System (Oxoid-UK). Confirmed *Pseudomonas aeruginosa* isolates were subjected to antibiotic sensitivity testing

(ABST) according to CLSI M100, 2018 for piperacillin-tazobactam (Oxoid-UK)., ticarcillin-clavulanate (HiMedia-India), ceftazidime (Oxoid-UK)., cefepime (HiMedia-India) aztreonam (HiMedia-India), Imipenem (Oxoid-UK)., meropenem (Oxoid-UK)., netilmicin (Oxoid-UK)., gentamicin (Oxoid-UK)., and amikacin (Oxoid-UK). (10).

Carbapenem resistance for the study was defined as resistance to at least one of the carbapenems tested as defined by the CLSI, 2018 breakpoints. Multidrug resistance and extensive resistance were defined according to the definitions published by Magiorakos et al. (11). Both the imipenem-EDTA combined disc test (CDT) and the imipenem-EDTA double-disc synergy test (DDST) were performed for all the carbapenem-resistant isolates. The CDT was performed according to the protocol described by Yong et al. (12). The DDST was performed according to the protocol described by Lee et al. (13). Automated cartridge-based Gene-Xpert™ Carba-R assay (Cepheid Europe SAS/ France) was performed on all the carbapenem-resistant isolates to detect *bla*KPC (*Klebsiella pneumoniae* carbapenemase), *bla*NDM (New Delhi metallo-β-lactamase), *bla*VIM (Verona integron-encoded metallo-β-lactamase), *bla*IMP-1(Imipenemase-1) and. *bla*OXA-48 (Oxacillinase-48) carbapenemases.

Results

Among 144 *Pseudomonas aeruginosa* isolates, 72% (n= 104) were from male patients and 28% (n=40) were from female patients. The age ranged from 8 months to 93 years with a mean age of 53 years (Figure 1).

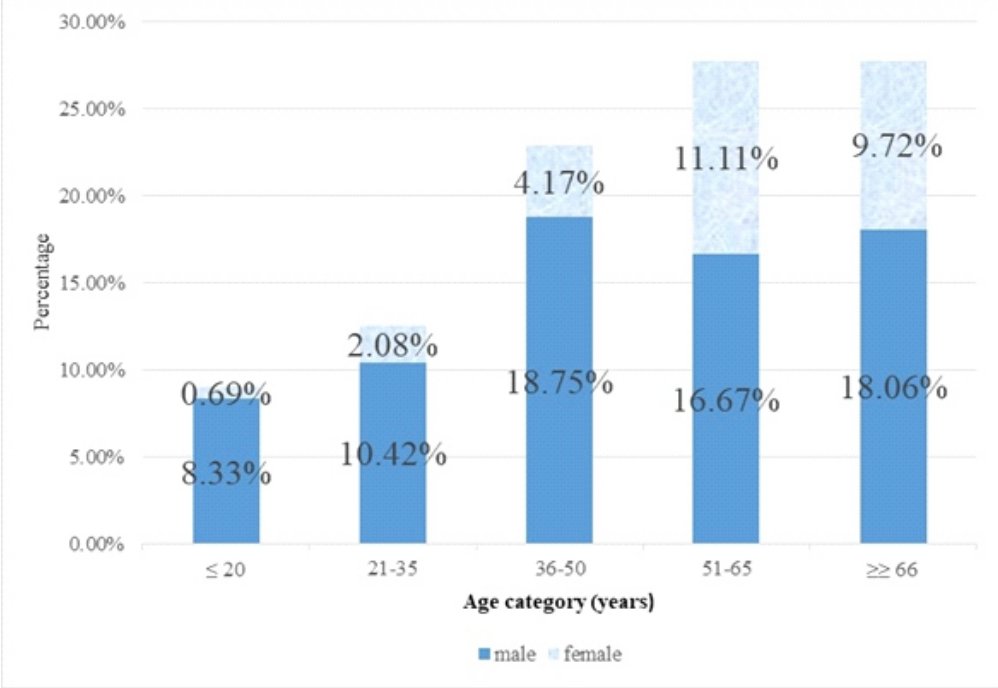

Figure 1: Age and gender distribution of *Pseudomonas aeruginosa* isolates

Among total isolates, the most were 51 (35.4%) respiratory isolates, while urinary isolates contributed to most of the carbapenem-resistant and carbapenemase-producing isolates (Table 1). Out of the study isolates, 37.5% (n=54) were from patients who were diagnosed with lower respiratory tract infections.

Meropenem and imipenem showed the highest sensitivities (82.6%) each. Ticarcillin–clavulanate was the least sensitive antibiotic (39.6%). Hundred and sixteen isolates were sensitive to both the carbapenems tested. Five isolates were intermediately sensitive to at least one of the carbapenems tested.

There were 23 (16%) CRPA isolates. Out of them, 20 isolates were resistant to both the carbapenems, while 3 were resistant to imipenem only. Higher antibiotic resistance rates for all the tested antibiotics were observed for carbapenem-resistant isolates compared to carbapenem susceptible isolates. Among carbapenem-resistant and susceptible isolates, the highest cross-resistance was observed for ciprofloxacin ($p<0.0001$), while the least resistance was observed for aztreonam (Table 2).

Out of the study cohort, 29.2% (n=42) of the isolates were multidrug-resistant while 9% (n=13) were extensively drug-resistant. The majority of carbapenem-resistant isolates (96%, n=22) were multidrug-resistant (Table 3).

Only 35% (8/23) of the carbapenem-resistant isolates produced a positive EDTA inhibition test with imipenem. Out of these, all eight phenotypic test-positive isolates were CDT-positive, while only one isolate (4.3%) produced a positive DDST. Only 17 isolates (17/23, 74%) yielded a positive Xpert Carba-R Assay. The overall prevalence of carbapenemases genes among *Pseudomonas aeruginosa* isolates was 11.8% (17/144). All the isolates that yielded a positive phenotypic test for MBL production were Xpert Carba-R Assay positive. Fifteen isolates yielded a single carbapenemase, while 2 isolates co-harboured carbapenemases. The majority of the single carbapenemases were NDM (64.7%, n =11) (Table 4).

Table 1: Distribution of *Pseudomonas aeruginosa* isolates among clinical specimens

Clinical specimen	**Percentage (%) and Number of isolates**		
	All the isolates	**Carbapenem-resistant**	**Carbapenemase-producing**
Blood	8.3% (12)	17.4% (4)	23.5% (4)
CSF	0.7% (1)	0	0
Pus	18.1% (26)	4.3% (1)	0
Urine	18.8% (27)	39.1% (9)	52.9% (9)
Respiratory (sputum and Bronco Alveolar Lavage)	35.4% (51)	30.4% (7)	17.6% (3)
Tissue	13.9% (20)	4.3% (1)	0
Peritoneal Fluid	4.9% (7)	4.3% (1)	5.9% (1)
Total	100% (144)	100% (23)	100% (17)

Table 2: Antibiotic sensitivity pattern of all the *Pseudomonas aeruginosa* isolates

Antibiotic	**Percentage (%) and number of isolates**		
	Sensitive	**Intermediate**	**Resistant**
Ticarcillin-clavulunate	39.58% (57)	24.3% (57)	36.1% (52)
Ceftazidime	68.8% (99)	6.5% (10)	24.3% (35)
Cefepime	72.2% (104)	4.9% (7)	22.9% (33)
Aztreonam	58.3% (84)	25.7% (37)	16% (23)
Meropenem	82.6% (119)	3.4% (5)	13.8% (20)
Gentamicin	59% (85)	5.6% (8)	35.4% (51)
Netilmicin	59.7% (86)	3.5% (55)	36.8% (56)
Amikacin	72.2% (104)	4.2% (6)	23.6% (34)
Ciprofloxacin	58.3% (84)	2% (2)	40.3% (58)

Table 3: Comparison of the cross-resistance on the antibiotics tested between carbapenem -resistant and carbapenem-susceptible *P. aeruginosa*

Antibiotic	Percentage (%) and No. of isolates	
	CRPA (n=23)	CSPA (n=116)
Ticarcillin-clavulunate	95.7% (22)	13.8% (25)
Piperacillin-tazobactam	69.6% (16)	13.8% (16)
Ceftazidime	69.6% (16)	12.9% (15)
Cefepime	78.8% (18)	9.5% (11)
Aztreonam	60.9% (14)	6.9% (8)
Gentamicin	95.7% (22)	20.7% (24)
Netilmicin	91.3% (21)	23.3% (27)
Amikacin	87.0% (20)	12.1% (14)
Ciprofloxacin	100.0% (23)	28.4% (33)

Table 4: Distribution of carbapenamase genes among carbapenem resistant *Pseudomonas aeruginosa* isolates

Type of carbapenamase	Percentage (%) and Number of positive samples
NDM	64.7% (11)
IMP-1	11.8% (2)
VIM	11.8% (2)
KPC	0
OXA-48	0
NDM+ VIM	11.8% (2)
Total	100% (17)

Discussion

Pseudomonas aeruginosa is known to be intrinsically resistant to many antibiotics. Acquired antibiotic resistance has also been added to this burden. This makes carbapenems an important treatment option, especially for MDR and complicated cases.

Most of the isolates in the present study were from respiratory specimens and from patients with lower respiratory tract infections, which was compatible with the previous studies (14,15). This may be because *Pseudomonas aeruginosa* is a common cause of both community-acquired and nosocomial pneumonia (16).

In Sri Lanka, only a few studies described the sensitivity pattern of *Pseudomonas*. Only one study provided details of the sensitivity of *Pseudomonas aeruginosa*, but with a very low sample number (n=15) (17). None of the local studies was directly focusing on the organism per se and mostly utilized only one sample type.

Among the tested antibiotic groups, carbapenems were the most sensitive. Nevertheless, the sensitivity to ceftazidime in the present study was 68.8% which was in line with the finding of Chandrasiri et al. (18). On the contrary, none of the isolates was resistant to ceftazidime in the study by Tissera et al. (17). These local studies together with the present study prove that the drug is still maintaining its effectiveness over the years. According to CLSI guidelines the organism is known to develop resistance to all antibiotics during prolonged treatment. Since the resistance to carbapenems is on the rise, ceftazidime would be an initial

option if we could preserve the drug with rational prescribing (10).

Ciprofloxacin demonstrated the highest resistance (40.3%), which was comparable with previous studies (19,20) Similarly, a high ciprofloxacin resistance rate (30.1%) was detected in Germany and it was the drug that had to be changed most frequently after reviewing the antibiogram (16). This may be due to the misuse of the drug as empirical treatment, especially in the community set up as indicated by a study conducted among the patients with community-acquired urinary tract infection in the Galle district, Sri Lanka, which demonstrated 41% resistance to ciprofloxacin in *Escherichia coli* and *Klebsiella* species (21).

The prevalence of carbapenem resistance in *Pseudomonas aeruginosa* at THK during the study period was 16%, while it was 13.3% in a local study [14]. Our findings are also in parallel with the regional and international studies (14,15,22). However, wide variability is reported in various studies reflecting the different patterns of antibiotic prescription and infection control measures practiced by the various countries.

Carbapenem-resistant isolates were having more than 60% resistance to all the tested antibiotics in the present study which is alarming. This emphasizes the importance of adhering to the antibiotic stewardship program. Comparable to the study by Meradji et al., our study demonstrated a significant cross-resistance for ciprofloxacin among carbapenem-resistant and sensitive isolates (23).

No previous local data is available on the occurrence of MDR and XDR rates in Sri Lanka, but this study indicates that the treatment of carbapenem-resistant *Pseudomonas aeruginosa* is problematic as 96% of them are MDR. This also highlights the necessity of proper infection control practices to prevent the spread of such organisms.

We noted that the CDT was superior to the DDST, which was comparable with the previous studies (24). Youg et al. had reported an excellent specificity in the imipenem + EDTA CDT for *Pseudomonas* species (12). Similarly, all the CDT-positive isolates of the current study yielded a positive Gene Xpert Carba-R Assay for MBLs. However, the detection rate of DDST was very low in this study compared to previous studies. The reason for this would have been the inability to achieve an adequate EDTA concentration (by diffusion) near the imipenem disc to obtain an effective chelating activity as described by Kali et al. (25).

In our study, the prevalence of carbapenemase-producing *Pseudomonas aeruginosa* isolates was 11.8% indicating that carbapenemase production was not uncommon in the study setting. Most regional studies identified NDM, VIM, and IMP (6, 26). In the present study, the most common carbapenemases gene was NDM (64.7%). The Indian subcontinent is known as the main reservoir of NDM producers and this explains the reason for the majority being NDM producers (27). However, Only NDM-1 had been identified among *Pseudomonas* species in Sri Lanka and this study provides a glimpse of the carbapenemase genes in *Pseudomonas aeruginosa in* Sri Lanka. Only a few reports in the literature describe the co-harboring of carbapenemases in *Pseudomonas aeruginosa* and it is reported to be unusual (28). In the present study 11.8% (n=2) of the isolates co-harboured NDM and VIM. This finding is directly in line with an Indian study, where 14% of the carbapenemase producers co-harboured NDM and VIM (29). Furthermore, several Indian studies had reported co-harboring of carbapenemases indicating that it is not a rare finding in the region (26,30).

The study was conducted in a single institution. Hence, it may affect the generalization of results. Minimum inhibitory concentrations (MIC) of meropenem and imipenem could not be performed due to financial constraints. CLSI recommends the micro broth dilution method to detect sensitivity to colistin, which is a drug used to treat MDR strains. Since the test was not performed, the study lacks the sensitivity pattern of colistin. The molecular analysis was performed only for carbapenem-resistant isolates but not for the carbapenem intermediately sensitive and sensitive groups. Thus genotypic resistance among the latter two

groups could not be assessed and may have yielded false negative results. The molecular basis of other carbapenem-resistant mechanisms such as loss of porins and overexpression of efflux pumps, which are identified as the commonest causes in *Pseudomonas aeruginosa* was not analyzed. Verification of the Gene Xpert Carba-R Assay was only performed with known positive and negative controls of KPC producers. Positive and negative controls of other tested carbapenemases could not be performed due to the unavailability of quality control samples. Only five major carbapenemases are detected by the Xpert Carba-R Assay. Thus the presence of other non-evaluated carbapenemases could not be excluded. Furthermore, the variants of the above carbapenemases may have yielded false negative results as described by the manufacturer.

Conclusions and Recommendations

The prevalence of carbapenem resistance among the *Pseudomonas aeruginosa* study isolates was 16%. Among the CRPA isolates, the highest cross-resistance was observed for ciprofloxacin. The difference in resistance to ciprofloxacin between carbapenem-resistant (100%) and carbapenem-sensitive isolates (28.4%) was statistically significant ($p < 0.0001$). The predominantly isolated carbapenemase among CRPA isolates was NDM (64.7%).

As high levels of antibiotic resistance in *Pseudomonas aeruginosa* were detected, the choice of empirical antibiotic should be carefully considered and infection control measures have to be strengthened at the concerned healthcare facility. A multicentered laboratory-based surveillance study, which is carried out for a longer duration is needed to decide on the prevalence of carbapenem resistance and carbapenemases among *Pseudomonas aeruginosa* in the country. Since the antibiotic resistance mechanisms of *Pseudomonas aeruginosa* is complex, further detailed phenotypic and genotypic analysis is required for a better understanding of all the antibiotic-resistant patterns. The epidemiological relatedness of carbapenemase genes should be analyzed by typing methods to demonstrate a clonal relationship to identify the strains with outbreak potential.

Conflicts of Interest

We declare that we have no conflicts of interest.

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Abstracts
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A_OP1
A novel polyherbal formulation for the management of oxidative stress and inflammation in doxorubicin-induced nephrotoxicity

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Background:
Herbal formulations provide desirable therapeutic effects in the management of drug-induced nephrotoxicity, which often demands remedial approaches with multiple protective effects. In this context, polyherbal formulations offer an invaluable resource due to their potential bio-interactions within and between the constituents.

Objectives:
The present study aimed to evaluate the efficacy of a novel polyherbal formulation derived from the leaves of *Abelmoschus moschatus* Medik. (Kapukinissa), *Asparagus falcatus* (L.) (Hathawariya), and whole plant of *Barleria prionitis* (L.) (Katukaradu), in ameliorating doxorubicin-induced nephrotoxicity via selected biomarkers of oxidative stress and inflammation.

Methodology:
There were six groups in the study; healthy control group, doxorubicin-induced nephrotoxic control group, three polyherbal formulation treated groups at three selected doses and a positive control group. The polyherbal formulation was made of the aqueous refluxed (4h) extract of equal quantities (1:1:1 by weight) of the three selected medicinal plants. The aqueous polyherbal formulation at the 200, 400 (therapeutic dose), and 600 mg/kg doses (treatment groups) and the standard drug; fosinopril at 0.09 mg/kg dose (positive control group) were administered orally to doxorubicin-induced (5 mg/kg) nephrotoxic male Wistar rats for 28 consecutive days. The kidney tissues were excised at the end, for the biochemical and immunohistochemical assessments. The results of treatment groups were compared with the doxorubicin-induced nephrotoxic control group (n=6/group).

Results:
Treatment with 400 and 600 mg/kg doses of the polyherbal formulation mitigated doxorubicin-induced oxidative stress by restoring antioxidant potential, as demonstrated by significantly increased levels of total antioxidant status (15%, 21%), glutathione reductase (61%, 102%) and glutathione peroxidase (18%, 45%) activities and decreased malondialdehyde formation (25%, 26%) in kidney homogenates ($p<0.05$). A reduction in the concentrations of TNF-α (40%, 35%) ($p<0.05$), IL-1β (36%, 42%) ($p>0.05$) and the immunohistochemical expression of COX-2 were observed, signifying potential anti-inflammatory effects. Immunohistochemical expression of BCL-2 (anti-apoptotic protein) was increased while Bax (pro-apoptotic protein) was reduced in the treatment groups compared to the doxorubicin-induced nephrotoxic control.

Conclusions:
The findings revealed that the polyherbal formulation at 400 and 600 mg/kg doses attenuate doxorubicin-induced nephrotoxicity via antioxidant, anti-inflammatory, and anti-apoptotic pathways.

Keywords:
Polyherbal Formulation, Doxorubicin-Induced Nephrotoxicity, Antioxidant Effects, Anti-Inflammatory Effects, Anti-Apoptotic Effects

A_OP2
Effectiveness of a health education leaflet designed to increase knowledge on birth defects among pregnant mothers

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Background:
Birth defects (BD) is a significant health problem among children and is associated with higher morbidity and mortality. However, BD are said to be largely preventable. Improving knowledge of BD and their prevention among females of reproductive age group is important to prevent BD in Sri Lanka.

Objectives:
This study was carried out to evaluate the effectiveness of a health education leaflet designed to increase knowledge on BD among pregnant mothers.

Methodology:
An interventional study was conducted recruiting pregnant mothers attending clinics of Bope-Poddala (intervention group, n=70) and Matara municipal council (control group, n=64), Medical officers of Health (MOH) areas. A self-administered questionnaire was used to evaluate the knowledge of pregnant mothers, and the post-evaluation was carried-out for both the intervention and control groups using the same questionnaire. Data were analysed using SPSS version 20. Mean percentage scores were calculated, and paired *t* test was used to identify the differences between means. The significance level was considered as $p<0.05$.

Results:
The mean percentage scores obtained on the knowledge of BD, associated factors of BD and prevention and management of BD were 68.1, 59.2 and 64.9, respectively by the intervention group during pre-intervention. The respective scores were 81.7, 75.5 and 79.9 ($p=0.000$) after the intervention. Among the control sample, the mean percentage score of knowledge of BD, associated factors and prevention and management were 68.6, 59.1, 66.2 in the pre-evaluation, and they were 67.4, 62.1, 67.7 in post-evaluation ($p>0.05$). The pregnant mothers highlighted the importance of the leaflet, and 92% (n=59) mothers have kept the leaflet with them to read it later or to share with others.

Conclusions:
The developed health education leaflet effectively increases the knowledge on BD and associated factors and the prevention and management of BD among pregnant mothers of the Bope-Poddala MOH area.

Keywords:
Birth defects, knowledge, health education, pregnant mothers, Sri Lanka

A_OP3
Knowledge, attitudes and practices of Adverse Drug Reaction reporting among healthcare professionals in Teaching Hospital Karapitiya

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Background:
Reporting of Adverse Drug Reactions (ADR) is the cornerstone of detecting uncommon ADR once the drugs are on the market. Many countries around the world have different methods to detect ADR. Spontaneous reporting of ADR by healthcare professionals is the only method in Sri Lanka which is currently available to detect ADR.

Objectives :
The objectives of this study were to describe the knowledge, attitudes and practices of ADR reporting among healthcare professionals at Teaching Hospital Karapitiya (THK).

Methodology:
A descriptive cross-sectional study was conducted at THK. The healthcare professionals (doctors and nurses) working in THK who were available during the study period were invited to the study. A self-administered pre-tested questionnaire comprising of 29 questions was given to the participants. Respondents were evaluated for their knowledge, attitude and practice related to ADR reporting. The data was analyzed using SPSS statistical software.

Results:
Of the total 444 respondents, 31% were doctors and 69% were nurses. Among them, 47% and 64.8% could correctly define the terms pharmacovigilance and ADR respectively. However, only 13 respondents (2.9%) have given correct answers to all the questions related to knowledge. Regarding the practices, only 18% of them have reported ADR at least once in their career while 64% had never seen an ADR reporting form and 61% were not aware of the formal process of ADR reporting. Regarding the attitude, the majority of respondents (71%) agreed that they have adequate time to fill an ADR reporting form, 63% agreed that ADR reporting has a positive outcome and 78% disagreed that ADR reporting would generate extra work.

Conclusions:
Although the majority was aware about ADR and the importance of their reporting, the knowledge and practice regarding the spontaneous reporting of ADR is inadequate. However, most of the respondents have shown a positive attitude towards ADR reporting. Sincere and sustained efforts should be made by concerned bodies to improve the knowledge, attitude, and practice of health care professionals. Continuous medical education, training and integration of ADR reporting into the clinical activities of healthcare professionals would be important.

***Key words**:*
Adverse Drug reactions, Knowledge, attitude and practice; health care professionals, ADR reporting

A_OP4
Exposure to community violence in adolescents in the Galle district

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Background:
Community violence exposure in adolescents, either as witnesses, victims, or perpetrators has been reported to cause a cascade of negative consequences for the adolescents' physical and mental health.

ObjectiveS:
The study attempted to describe community violence exposure in adolescents.

Methodology:
The study was conducted in two mixed schools in the Udugama MOH area of the Galle district, as a school-based screening. The sample consisted of 346 (females = 52%) school children aged 14-16 years. The rate, frequency, and degree of violence exposure were measured using the 'child Exposure to Domestic Violence (CEDV) scale and the questions were directed to discern the child's exposure to community violence, verbal or physical, either as a witness, victim, or perpetrator.

Results:
Community violence exposure was detected in 14.3% of children and the majority (70%) were males. Thus, a significant association was detected between the male gender and exposure to community violence (p=0.001). Socioeconomic status had a weak negative correlation with exposure to violence (r= -0.161). Further, 19.5% of adolescents experienced verbal violence as witnesses compared to being either victims (3.8%) or perpetrators (2.7%). A similar pattern appeared in physical violence, but a significant increase in prevalence was detected in witnesses (55.7%) and perpetrators (28.1%).

Conclusion:
The prevalence of community exposure is low in Sri Lanka compared to other countries. Among the exposed population, a remarkable prevalence is seen among males. The socioeconomic status of an adolescent's family has a significant association with community violence exposure, rendering children from low socioeconomic status to be more vulnerable to community violence.

***Keywords**:*
Adolescents, Community violence, Exposure, Galle

A_OP5
'Insulin Treatment appraisal Scale' to evaluate 'Psychological Insulin Resistance' in patients diagnosed with type 2 diabetes mellitus

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Background:
Clinicians find introducing Insulin to patients challenging, due to reluctancy of patients often described as 'Psychological Insulin Resistance' (PIR), of which the evidence from South Asian region is limited.

Objective:
This study aimed to evaluate the PIR in patients diagnosed with T2DM in a Sri Lankan rural setting.

Methods:
A descriptive cross-sectional study was conducted at the endocrinology clinic, District General Hospital, Hambantota, on adults over 18 years diagnosed with T2DM. The 20-item Insulin Treatment Appraisal Scale (ITAS) was used to evaluate PIR. Descriptive and Exploratory factor analysis (EFA) were performed.

Results:
Among 311 participants (mean age 54.7 years, SD=±10.4), 63.7% were females. Out of the participants, 35% had only primary education, and more than 60% belonged to low-income families (<Rs 50,000/month). Occupationally, 44.4% (n=138) were unemployed, 15.1% (n=47) were farmers and 12.5% (n=38) were unskilled workers. The median duration of T2DM was four years (IQR 3-8). The mean glycosylated haemoglobin (HbA1c) was 7.1% (±1.3). Only 24.4 % (n=76) of participants were on insulin. All items of ITAS had good internal consistency and reliability (Cronbach's alpha>0.7). The prevalence of PIR was 76.8% (n=239). EFA revealed five perceived latent factors contributed to PIR; insulin treatment as a personal failure, adverse effects, reluctancy to adopt lifestyle changes, lack of positive attitudes and attitudes regarding needle usage. 'Insulin treatment as a personal failure' had the highest contribution (25.8%) to PIR while 'negative attitudes regarding needle usage' had the least contribution (16.8%). Further, PIR was significantly associated with low levels of education ($p<0.05$) but not with gender, HbA1c level, duration of T2DM or psychological status ($p>0.05$).

Conclusion:
According to the ITAS, the high prevalence of PIR in rural settings in Sri Lanka is mainly due to perceiving insulin treatment as a personal failure which is independent of psychological status and disease control.

***Key words**:*
Insulin Treatment Appraisal Scale, Psychological Insulin Resistance, Rural setting

A_OP6

In-vitro assessment of carbapenem susceptibility against clinical isolates of extended spectrum beta-lactamase producing Gram-negative bacteria in the Teaching Hospital, Karapitiya

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Background:
Multidrug-resistant bacteria, including extended-spectrum beta-lactamase (ESBL) producing Gram-negatives, are increasingly isolated in both community and hospital-acquired infections. Treatment of these infections is challenging because of the scarcity of effective antimicrobials and limited evidence of efficacy. Carbapenems are being commonly used to treat these infections.

Objectives:
To determine the in-vitro susceptibilities of ertapenem, meropenem and imipenem against clinical isolates of ESBL-producing Gram-negative pathogens isolated in the Microbiology laboratory in the THK

Methodology:
A total of 157 clinical isolates of ESBL-producing Gram-negative bacteria were collected from patients admitted to Teaching Hospital, Karapitiya, from November 2021 to July 2022. A double disc synergy test identified ESBL producers. Antibiotic sensitivity patterns of these isolates against ertapenem, meropenem and imipenem were performed by disc diffusion test according to CLSI guidelines. Data were analysed using MINITAB-18 statistical software.

Results:
The mean age was 49.4 years (n=157; SD± 20.8), ranging from a newborn to 92 years. The majority (55.4%) were females. The ESBL Gram-negatives were predominantly isolated from urine 40.1% (n=63), followed by sputum 19.7% (n=31), and blood 14.0% (n=22). *Klebsiella* spp (33.8%) and *E. coli* (27.4%) were the predominant isolates. The overall sensitivity of the ESBL producers against meropenem, ertapenem and imipenem were 93.6%, 91.7% and 90.5%, respectively. A total of 2.6% (n=4) of isolates was resistant to all three carbapenems, whereas 9.6% (n=15) of isolates were resistant to at least one carbapenem. Of all, 15.3% (24) isolates were categorised as not-susceptible to carbapenem as they were included in the resistant and intermediate groups.

Conclusions:
No significant difference in sensitivity against ESBL-producing culture isolates was detected in the three carbapenems tested. Nevertheless, in vitro sensitivity assays should be encouraged to guide the selection of the best carbapenem.

Keywords:
Carbapenem, ESBL Producing, Gram-Negative Pathogens, In Vitro Assessment, Teaching Hospital Karapitiya

A_PP1

Diagnostic accuracy of preterm babies using maternal anthropometric parameters: A single center study in Galle district

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Background:
A birth that occurs before 37 full weeks of pregnancy is considered premature. It has a significant risk of morbidity and mortality, especially in very preterm newborns. This study was conducted to determine the most effective simple maternal anthropometric measure for detecting preterm babies prior to delivery.

Methods:
In a hospital-based cross-sectional study of 333 mothers with singleton pregnancies, maternal anthropometric measurements (pre-pregnancy weight, maternal height, pre-pregnancy BMI, and pregnancy weight gain) and period of gestation at delivery was taken. Pregnant mothers who had multiple pregnancies, registered after 12 weeks of gestation, pre-existing disease conditions that might affect the anthropometric parameters and mothers admitted for planned caesarian section were excluded from the study. The effect of these maternal anthropometric parameters on the period of gestation at delivery was investigated by receiver operating characteristic (ROC) curves analysis. The area under the curve (AUC) at 0.05 significance level was used to identify the best simple maternal anthropometric parameter for identifying preterm babies.

Results:
Preterm deliveries were detected among 18.3% (n=60) of newborns. Pregnancy weight gain (AUC=0.618, 95% CI 0.536 – 0.701, $p<0.01$) was identified as the best maternal anthropometric parameter with diagnostic accuracy for identifying preterm babies. AUC of pre-pregnancy weight (AUC=0.462, 95% CI 0.386 – 0.537, $p>0.05$), maternal height (AUC=0.510, 95% CI 0.437 – 0.583, $p>0.05$) and pre-pregnancy BMI (AUC=0.453, 95% CI 0.375 – 0.531, $p>0.05$) did not show statistically significant results. For the prediction of preterm babies, the cutoff value of pregnancy weight gain was 7.25 kg.

Conclusion:
Pregnancy weight gain was found to be the best maternal anthropometric parameter for picking up babies with prematurity. Hence it can be used to detect risk mothers for preterm deliveries during the antenatal period.

Keywords:
maternal anthropometric parameter, preterm births, diagnostic accuracy

A_PP2

Delineation of the anatomy of the craniocervical segment of the vertebral artery among adult Sri Lankans - an MRA study

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Introduction:
Vertebral arteries (VA) vascularize the structures of the central nervous system. For the descriptive purpose, VA divides into four segments; among them, segment 3 (V3) is related to the craniocervical junction (CCJ). Vascular anatomical variations of V3 are known to increase the risk of posterior cerebral circulation infarctions and iatrogenic injuries during CCJ reconstruction surgeries. However, such data is scarce for Sri Lankan populations.

Objectives:
To describe the anatomy of the V3 segment in a sample of adult Sri Lankans using magnetic Resonenet Imaging Angiograms (MRA).

Material and Methods:
A retrospective-cross-sectional-observational study was conducted using CCJ MRAs (150 patients) done at Teaching Hospital Rathnapura. Patients with previous CCJ surgery or trauma were excluded. V3 segment diameter just below the foramen magnum, and the right or left side dominance (laterality) recorded using MRAs. The dominance was defined if the right & left V3 diameter difference was more than 0.3mm. The $p<0.05$ was considered significant.

Results:
The study population consisted of 52% males (mean age:48 years) and 48% of females (mean age: 51 years). The mean diameter of V3 segment in females was 3.2±0.5mm (right side) and in left side 3.22±0.7mm (T=3.87; p=0.04). In males V3 diameter was 2.6±0.86mm (right) and 3.0±0.64mm in left side (T=4.11; p=0.003). Left VA dominance was identified in 47.9%, and right VA dominance in 25.6%. In 26.5% of patients, the diameter difference between the right and left VA was less than 0.3mm (co-dominance).

Conclusion:
In the preliminary analysis, V3 segment VA anatomy has shown statistically significant laterality. As it may have a significant impact on intra-cerebral vascular comorbidities, further studies are recommended to delineate the association between anatomical variations and surgical/ ischemic risk among the Sri Lankan population.

***Key words**:*

MRA, Vertebral artery, V3 segment, Anatomy

A_PP3
Knowledge, practices and psychological stress among doctors serving in COVID – 19 Units in Sri Lanka

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Background:
Coronavirus disease 2019 was a multifaceted challenge for the medical field. The Sri Lankan health sector had to expand its boundaries in multiple aspects including gaining relevant knowledge, ensuring the health of the staff, developing infrastructure etc.

Objectives:
This study aimed to assess and describe the knowledge, safety practices and psychological stress among doctors working in covid units during the crisis.

Methodology:
This was a descriptive cross-sectional study conducted from April to June 2022 via a self-administered google form disseminated through online social media platforms.

Results:
Results showed a good reliability with a Cronbach's alpha of 0.631. Out of 89 eligible participants, the majority (53%) were between 30 – 39 years of age. There were 65% females and 35% males. 33% were Residential House Officers and 66% were Medical Officers. Most of the participants worked in isolation wards (44%). The mean knowledge score was 5.35(range 1-8).63% demonstrated a good knowledge (>=5). The mean score for engaging in safety practices was 79% (range 55%-97%). 85% of the participants had moderate stress according to the perceived stress scale and none of the factors assessed in the study had an association with the stress level. Even the basic demographic factors such as age, gender, marital status and number of children or the level of knowledge did not show any association with the level of stress. However, there was a mild correlation between the fact that the participants had a more stressful personal life than the stress at work (p=0.01).

Conclusion:
It can be concluded that most Sri Lankan doctors had a good knowledge on covid 19. Their safety practices to reduce transmission were also good. However, it was evident that most of them were in a moderate level of stress, although it could not be attributed to the covid-related work environment.

Keywords:
Covid 19, Doctors, Knowledge, Practices, Psychological stress

A_PP4

Emotional and behavioral problems, daily stressors and school performance of adolescents in Galle

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Background:
Adolescents' academic performance may depend on their psychological status and as well as their stressors in day today life.

Objectives:
This study was conducted to assess Emotional and Behavioural Problems (EBP) and daily stressors and their relation to academic performance of adolescents.

Methods:
A school-based screening was conducted in conveniently selected two MOH areas of Galle district. Ethical approval was obtained from the Ethics Review Committee of Faculty of Medicine, University of Ruhuna. Five schools were selected randomly from each area and all students in grade 8 and 10 were invited for the study. The adolescent version of the Strengths and Difficulties Questionnaire (SDQ) was used for data collection. The Strengths and Difficulties Questionnaires is a self-administered questionnaire that has been validated to be used among Sri Lankan adolescents. The questionnaires measured Emotional and Behavioural problems and daily stressors of the adolescents. The academic performance was obtained by the subject mark of maths, science, English and Sinhala at the end of the year school examination which was held two months before the screening.

Results:
There were 755 adolescents age ranged 12 to 16 years with 54% females. Abnormal to borderline category of EBP was reported in 13.6% adolescents (emotional problems 12.6%, conduct problems 12.2%, hyperactivity 8.5%, peer problems 19.5% and pro-social behavior 5.8%). Academic performance was significantly and negatively correlated with EBP total scale ($r = -0.220, p<0.001$) and with daily stressors ($r = -0.362, p< 0.00$). EBP significantly reduce academic performance of adolescents ($\beta = -242, p< 0.00$) even controlling for age, gender and daily stressors of them.

Conclusion:
There is a considerable level of EBP among adolescents and the symptoms significantly reduced their academic performance. EBP need to be screened in this age group and required treatment should be provided to improve their school educational performance.

***Keywords**:*
Adolescents, Daily stressors, Emotional and Behavioral Problems, Galle, School performance

A_PP5

Trends and patterns of long bone fractures in relation to the road traffic accidents ,assaults and falls among patients admitted to emergency treatment unit,Teaching hospital Karapitiya

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Background:
The long bone fractures (LBF) could be due to various causes which may be road traffic accident (RTA)s, assaults and falls.

Objectives:
To determine the prevalence of LBF types, patterns, and associated factors in relation to RTAs, falls, and assaults.

Methodology:
A descriptive cross-sectional, prospective study was conducted on patients with LBF between 18- 60 years, attended to Teaching Hospital, Karapitiya.

Results:
A total number of 300 patients with LBFs admitted to the hospital following assaults, falls and RTAs were included. Most of the patients (77.7%) were males. Majority (66% ,77) were between 18 – 24 years of age. Out of the total 78.6% (236) were due to RTA followed by assaults.
The motorcycle riders were the commonest victims with LBFs followed by the vehicular drivers. In motor cycle accidents the tibia was the most fractured bone in riders (113,33%) followed by the femur. When the relationship between vehicles and the victims with LBFs were concerned 153 (66.81%) cases were motorcycles, followed by three-wheelers. When the assaults were considered 39 (92.85%) of LBFs were due to blunt forced weapon and upper limb fractures were observed frequently.
A total number of 426 LBFs were present in the total number of 300 patients. Tibia was the most fractured bone 191(44.83%) followed by the radius. The clavicle was the least frequently fractured bone 9(2.1%).
When analyzing the type of long bone fractures, simple fractures were the commonest (417,97.88%) followed by the comminuted fractures. The oblique fractures were observed in 235(56.35%) followed by the transverse fractures. The spiral fractures were the least common. There were 399(93.66%) of closed fractures and 27(6.33%) compound fractures.

Conclusion:
The road traffic accidents were the most common determinant of fractures. The motorcycle riders were the commonest victims of LBFs. Using personal protective measures, legal act implementation and improvement of injury surveillance were recommended to reduce preventable long bone fractures.

Keywords:
Long bone fractures, road traffic accidents, assaults, fall

A_PP6

Perceptions of medical teachers regarding curriculum delivery and professionalism training in a state medical school, Sri Lanka

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Background:
Frameworks of medical education have evolved across the world. Sri Lankan medical school curricular need reforms to operate in the light of global frameworks. Stakeholders' positive perceptions largely impact the success of curriculum reform. Medical teachers play a vital role in designing and delivering the curriculum in Sri Lanka. We aimed to evaluate the medical teacher's perception of global medical education frameworks.

Objectives:
The objective of this study was to explore the medical teachers' perceptions regarding the following four aspects of the undergraduate medical curriculum: curricular integration, student-centered teaching/learning, emphasis on formative assessments, and professionalism training.

Methodology:
We conducted an online survey by using a thematically organized questionnaire at the Faculty of Medicine, University of Ruhuna. Participants included confirmed Lecturers, Senior Lecturers, Professors, and Senior Professors from all 14 departments. Data were interpreted quantitatively and qualitatively.

Results:
A total of 88 medical teachers were invited to participate, and 56 responded, the response rate was 63%. All teachers agreed that curricular integration was essential, 70 % of them agreed on a combined approach of horizontal and vertical integration, while 30% were interested in modular integration. Small Group Discussions, Problem Based Learning, Case Based Learning, and Flipped Classrooms were the highly rated student-centered teaching/learning methods. Workplace-based learning was perceived as an effective method for clinical training. Nearly 66% of medical teachers perceived that the students should have more formative assessments and end-of-assessment feedback. All medical teachers agreed for that it is essential to have professional development training paralleling with the medical curriculum.

Conclusions:
Medical teachers' positive perceptions on curricular integration, professionalism training, and student-centered teaching-learning methods indicate the possibility of curricular revision to suit global medical education needs. Their insight on formative assessments could be improved with staff training. Even though our study exceeds the average online survey response rate, no respondent's bias could be estimated.

Keywords:
Medical Teacher, Perceptions, Curriculum, Professional Development, Medical Education

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A_PP7

Effect of aqueous extract of *Psidium guajava* (Guava) leaves on hyperglycemia in diabetes induced Wistar rats

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Background:
Health care systems around the world are gravely concerned about the rising incidence of diabetes mellitus. Although effective diabetes optimal oral hypoglycaemic agents are available, novel treatments are being investigated. *Psidium guajava* is a widespread plant in tropical and subtropical countries. Guava leaves have been used in traditional medicine to treat diabetes mellitus in many countries.

Objectives:
To determine the effects on hyperglycaemia of *P. guajava* leaf extracts in diabetes induced Wistar rats

Methodology:
Guava aqueous leaf extracts (GLE) were prepared using ultra-sound assisted extraction (Sonication) and freeze-dried. Streptozotocin 40 mg/kg intraperitoneal-injection was used to induce diabetes. Two groups of diabetes-induced Wistar rats (6 rats/group) were treated daily with GLE (200 mg/kg/day) and metformin (200 mg/kg/day) respectively for 42 days. Fasting blood sugar (FBS) of rats was measured at baseline and fortnightly for 42 days while receiving the treatments. Wilcoxon Signed Rank and Kruskal-Wallis tests were used for statistical analysis using SPSS version 22.

Results:
In GLE-treated group, median FBS (IQR) at baseline and 4-weeks after the treatment were 322 (255-340) mg/dL and 160(116-180) mg/dL (P = 0.018). In metformin group, median of FBS (IQR) at baseline and 4-weeks after the treatment were 238(216-252) mg/dL and 174(134-212) mg/dL (P=0.128). After 4 weeks of treatments, the median (IQR) of reduction of FBS in GLE and metformin arms were 154(112-194) mg/dL and 78(15-113) mg/dL respectively. When median (IQR) reduction of FBS in both groups were compared with Kruskal-Wallis test after 4 weeks of treatments, there was not significant difference (p=0.06).

Conclusions:
It was concluded that GLE has significant effect on lowering FBS.

Keywords:
Diabetes Mellitus, Fasting Blood Sugar, Psidium Guajava, Wistar Rats

A_PP8
Epidemiological investigation of a food poisoning outbreak in an occupational setting

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Background:
Food poisoning has been a major threat to public health with its significant mortality and morbidity. An increasing trend is noted in Sri Lanka due to changes in food and food related behaviours and lack of implementation of safety measures. Free trade zones in Sri Lanka occupy factories with large groups of workers and their meals supplied by factories leading to a higher risk of food poisoning outbreaks. A food poisoning outbreak was occurred in a factory in free trade zone Koggala, Sri Lanka and a field investigation was carried out to control and identify the cause.

Objectives:
To identify the cause or the carrier for the food poisoning outbreak at the free trade zone Koggala

Methods:
A team comprised of public health officials visited the site and immediate control measures (stopping providing food, advise on hand hygiene to workers etc.) were taken and essential sampling was done. Data on food intake on the day and symptoms were collected from each worker in the factory using an online form. Line list was prepared. Attack rates, relative risks and odds ratios were calculated for different food items and adjusted odds ratios were obtained using logistic regression. Stool samples collected from hospitalized patients for stool full reports and cultures.

Results:
Among 1388 responded 1181 (85.1%) had lunch from the factory and 75.6% were symptomatic with abdominal pain, vomiting, diarrhoea and fever and 31.6% were hospitalized. Chicken has the highest attack rate (0.88) with highest relative risk and odds ratio (10.9 and 38.8 respectively). Only having chicken for the lunch showed a significant association with symptoms (p-value<0.001). Samples taken were not positive for Salmonella and Escherichia and all stool samples were normal.

Conclusion:
The probable cause for food poisoning was a bacterial or viral pathogen and vehicle for transmission is chicken and outbreak has been controlled with simple sanitary measures like hand hygiene and general precautions.

Keywords:
Food Poisoning, Outbreak Investigation, Occupational Setting

S_OP1

Pre-gravid physical activity and unhealthy eating behavior: Are they risk factors for pregnancy induced hypertension and gestational diabetes mellitus?

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Background;
Pregnancy Induced Hypertension (PIH) and Gestational Diabetes Mellitus (GDM) have become feared complications of pregnancy which collaboratively cause adverse maternal and neonatal outcome. Effects of physical activity and unhealthy eating behavior on hypertension and diabetes mellitus are well documented, but not on PIH and GDM.

Objectives:
To assess the association between pre-gravid physical activity and unhealthy eating behavior with PIH and GDM as a combined outcome among pregnant mothers admitted to Teaching Hospital Mahamodara (THM).

Methodology:
A hospital based cross-sectional study was conducted among randomly selected 412 mothers admitted to antenatal wards for the delivery at THM. Physical activity level was measured by validated International Physical Activity Questionnaire (IPAQ) and assessed based on protocol for IPAQ. Physical activity status was categorized in to 'High' and 'Moderate or Low' based on metabolic equivalent minutes /week according to IPAQ protocol. Unhealthy eating behavior was assessed according to Healthy Eating Assessment Tool (HEAT) and categorized in to 'Excellent or Good' and 'Fair or Need improvement' based on HEAT score. Chi-square test and odd ratio (OR) were used to assess, the association between pre-gravid physical activity and unhealthy eating behavior with PIH and GDM as a combined outcome at 0.05 significant level.

Results:
Mean (SD) age of the sample was 29.3(5.4) years. Nearly 80% were above 25 years and educated up to GCE O/L while 70.1% were housewives. The prevalence of PIH and GDM were 12.4% and 16.3% respectively. Collaboratively, 'Good and Excellent' eating behavior were detected among 87.4% and 51.7% had high physical activity. Housewives were more likely to have 'moderate or low' level of physical activity compared to occupied mothers ($p<0.001$) while age($p=0.33$) and educational level($p=0.27$) did not have significant association. Mothers with higher education ($p<0.01$) were more likely to have 'Good or Excellent' eating behavior. Interestingly, mothers having high physical activity (OR=0.48, 95% CI=0.48–0.75) and 'Good or Excellent' eating behavior (OR=0.11, 95% CI=0.06-0.22) were less likely to develop PIH and GDM as a combined outcome.

Conclusion:
Being physically active and adhering to healthy eating habits reduce the risk of developing PIH and GDM in combination. Therefore, necessary nutritional interventions and lifestyle modifications need to be recommended during antenatal service care provision.

Keywords*: Pre-Gravid Physical Activity, Unhealthy Eating Behavior, PIH, GDM*

S_OP2
Junk food consumption among school going adolescents in Galle Municipality

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Background:
Addiction to junk foods among school children around the world is increasing due to their busy and hectic lifestyle with studies.

Objectives:
To assess the patterns, frequency, and effect of COVID 19 pandemic on junk food consumption among school children in the Galle Municipality area.

Methodology:
A descriptive cross–sectional study was conducted among 317 students from grades 10 and 11 using a questionnaire which included the information on the consumption of selected junk food items, knowledge and influencing factors for buying such foods and the impact of recent COVID pandemic on food consumption.

Results:
The response rate was 82.5%. Frequently consumed junk food was bakery products and instant noodles (n=139;44%). Females frequently consumed flavoured dairy products (n=38;32%) while males consumed bakery products and instant noodles (n=104;52%).

Higher preference was seen due to the tastiness and attractive package (n=231;73%). Media promotion (n=241;76%) was the major inducement modality. Majority of students had junk foods >2 times per week (n=269;85%) but they were less physically active (n=222;83%) during school time. However, 254 students (80%) were knowledgeable on long term effects of junk food consumption but 213 consumed junk foods >2 times per week. Among them 114 students (36%) had stopped bringing junk foods for lunch break after the COVID pandemic.

Conclusion:
Junk food consumption was a common practice among school children. Television advertisements and attractive packaging plays a major role in buying these food items. COVID has a negative impact on junk food consumption while knowledge about adverse effects didn't play such impact. Considerable number of students had substituted their junk food meal at school with homemade foods during COVID pandemic situation of the country.

Keywords:
Junk Foods, School Children, Galle, Covid-19 Pandemic.

S-OP3
Psychological distress among public health staff during Covid-19 pandemic in selected MOH areas of Galle District

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Introduction:
The public health staff plays a frontline role in the battlefield of COVID pandemic. Their psychological wellbeing is therefore important in order to maintain an efficient healthcare force to combat this disease.

Objectives:
To describe the psychological distress experienced by the public health staff of Galle district during the time of COVID-19 pandemic.

Methodology:
A descriptive, cross-sectional study was conducted among 340 public health staff members conveniently selected from 10 MOH offices in Galle District. A self-administered questionnaire was used to collect data. Psychological distress was measured by Covid-19 Peritraumatic Distress Index (CPDI).

Results:
The mean age of the sample was 42.84 years (SD= 9.56). A majority 62.4% (n=212) of the participants has experienced no distressed (Score < 28) while 35.6% (n=121) experienced mild to moderately distress (score>28 to <51) and 2.1% (n=7) had severely distressed (score > 52). Psychological distress was more among the young workers age < 44 years than the old. (Chi square= 0.03, df=1 and p=0.006) and it showed a weak negative correlation with age. (Pearson r= -0.135). Further there was a significant association between increasing in number of working days per month and psychological distress (chi square=4.545, df=1 and p=0.033).

Conclusions:
The results showed that nearly two third of the sample was not distressed and only 7 out of the rest had severe distress. This revels that a majority of the public health staff had good resilience to psychological distress during this pandemic while a handful needs definite psychological support. Therefore, we recommend doing further studies to identify the risk and resilient factors for psychological wellbeing among public health staff and to arrange mental health supportive for staff experiencing distress.

***Keywords**:*
Psychological distress, public health staff, COVID-19 Pandemic

S-OP4

Prevalence and preventive measures of unintentional domestic injuries among children aged up to five years in Bope-Poddala Medical Officer of Health area

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Background:
Unintentional domestic childhood injuries (DCI) are a significant category of preventable causes of morbidity and mortality among young children worldwide and in Sri Lanka.

Objectives:
This study was carried out to determine the prevalence and preventive measures of unintentional DCI among children up to five years of age in Bope-Poddala Medical Officer of Health (MOH) area.

Methodology:
A cross-sectional study was conducted among systematically-selected 252 parents of children (aged up to five years), attending the Child Welfare Clinics conducted by Bope-Poddala MOH office. Data were obtained through a self-administered questionnaire and were analyzed using SPSS version 26.0. Descriptive statistics and chi square analysis were used. $p<0.05$ was considered as the level of significance.

Results:
The mean age of the children was 41.9 (SD$\pm$17.033, range 3-60) months and 51.2% (n=129) were males.
The overall prevalence of DCI among the sample was 78.2%. The most common DCI type was falls (n=168, 64.1%; of which 13.2% reported hospitalization) followed by injuries due to sharp-objects (n=91, 34.7%). Burns, foreign body impaction in ear-nose-throat, animal-bites and poisoning were reported among 53(20.2%), 42(16%), 36(14.3%) and 14(5.3%) children respectively. Age >1year ($p<0.001$) and low educational level of the parents ($p<0.05$) were associated with DCI among children.
The measures taken to prevent each type of DCI among children were satisfactory (>80%) with a lesser level (60.8%) of practices to prevent falls. Previous experience on DCI was found to be associated with a satisfactory practice of preventive measures ($p=0.003$).

Conclusion:
There is a higher prevalence of DCI among young children in Bope-Poddala MOH area. Falls and injuries due to sharp objects were the most common types of DCI.
Increasing awareness on DCI and preventive measures among parents would help to prevent DCI and associated consequences among young children.

Keywords:
Prevalence, Prevention, Domestic childhood injuries, Children up to five years

S_OP5

Association between compliance with COVID-19 preventive measures and depressive symptomatology among older adults in Galle, Sri Lanka

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Background:
Adherence to preventive measures of COVID-19 would be vital to maintain good health during outbreaks. Preventive measures of COVID-19, however, may have put older adults to limit their daily activities, making them vulnerable to develop psychological problems.

Objectives:
To assess the prevalence of compliance rates of preventive measures of COVID-19 among older adults in Galle and to investigate possible associations between such behaviours and development of depressive symptoms among them.

Methodology:
A descriptive cross-sectional study, employing a self-administered questionnaire, was conducted among 324 older adults. Hand washing, wearing masks, social distancing and limited travelling were the preventive measures studied. Depressive symptoms were assessed using the Center for Epidemiologic Studies Depression Scale- Revised version 10 (CESD-R-10) scale, where higher scores indicate elevated level of depressive symptoms. Independent sample t test was used in the analysis. The level of significance was considered as $p<0.05$. Ethical clearance was obtained from the ethics committee, Faculty of Medicine, Galle.

Results:
Of the total, 96.60% had reported maintaining good hand hygiene practice, 81.17% a limited travelling, 96.29% an adequate social distancing. All the participants reported having wearing masks when necessary. The mean CESD score was 7.34(*SD*=6.32). Those who reported having poor hand washing practice [M=13.09(*SD*=5.48) versus M=7.14(*SD*=6.32), *t*= -3.079, p=0.002] and those who reported having less adherence to social distancing practice [M=10.33(*SD*=5.66) versus 7.23(*SD*=6.38), t= -1.659, p=0.098] were more likely to report elevated depressive symptoms compared to that of others. Although a slightly lower mean value of depressive symptoms was observed among those who limited their travelling during the pandemic [M=7.14(*SD*=6.35) versus M=8.20(*SD*=6.50)], no significant difference was observed.

Discussion and Conclusion:
The practice of preventive measures of COVID-19 was satisfactory among older adults in Galle. Promotional campaigns of precautionary actions for COVID-19 seemed to have contributed to mitigate COVID-19 related stress and depression in older adults in Galle.

Key Words:
COVID-19, preventive measures, depressive symptomatology, older adults, Galle.

S_OP6
Quality of life of adolescent pregnant women in the Galle District

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Background:
Adolescence is the period between 10 and 19 years. Adolescent pregnancy is a global health problem and it determined the quality of life and role of women in the society other than the health risks and knowledge on QOL of will be important in the overall management of adolescent pregnant women.

Objectives:
To assess the quality of life (QoL) of adolescent pregnant women in the Galle district.

Methodology:
A hospital-based descriptive cross-sectional study was conducted in antenatal clinics of four main hospitals in the Galle district: Teaching Hospital (Mahamodara) and Base Hospitals (Balapitiya, Udugama, Elpitiya). The study sample comprised of 252 adolescent pregnant women, and their quality of life was assessed by using validated Sinhala version of Paediatric Quality of Life Inventory 4.0 (PeadQL 4.0).

Results:
Mean age of the study participants was 18.2 years (± 1.0). Majority of the participants were married (78.9%, n= 199) living in rural areas (73.0%, n=184), studied up to O/L (56.7%, n=143) and had unplanned pregnancies (83.7%, n=211). The study tool assessed the QoL of preceeding month. Total score for quality of life was 70.63 (± 6.21) and the mean (± SD) score for physical functioning, emotional functioning and social functioning were 75.03 (± 8.37), 60.91 (± 13.01) and 73.21 (± 8.00) respectively. Association between total QoL and marital status, educational level, area of living, and whether the pregnancy is planned or not were not statistically significant ($p>0.05$).

Conclusion:
Overall QoL of adolescent pregnant women in the Galle district during the preceding one month was good according to the total score and the scores of three functioning scales of PeadQL 4.0.

Keywords:
Adolescent Pregnancy, Paedql 4.0, Quality of Life, Galle District

S_PP1

Postpartum morbidities among mothers admitted to a tertiary care hospital in Southern Sri Lanka

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Introduction:
Sri Lanka has been working in the past few decades to maintain the optimal standards of maternal care. The maternal morbidity rates and ratios in our country indicate the improvement of maternal care where Sri-Lanka is reaching the standards of developed countries. This study will benefit the policy makers for enhancement of maternal care.

Objectives:
To evaluate postpartum complications in mothers who deliver at Teaching Hospital Mahamodara.

Methodology
A hospital based cross-sectional study was conducted among a consecutive sample of mothers who delivered at Teaching Hospital Mahamodara. The questionnaire was pretested on a random sample of 25 mothers visiting the postnatal clinic at Bope-Poddala MOH area. Data was collected using interviewer-based questionnaire with the evidence of medical records and analyzed using statistical package for social sciences (SPSS) 20th version. Types and prevalence of postpartum morbidities was assessed, and chi-square was used to assess the factors associated with postpartum morbidities with a significance level of 0.05.

Results:
Total of 432 mothers were included. Overall, 22.9% (n=99) had immediate postpartum morbidities. Among them were postpartum haemorrhage 30.3%(n=30), hypertension 26.2%(n=26), diabetes mellitus 26.2%(n=26), urinary tract infections 10.1%(n=10) and postpartum psychosis 7.0%(n=7). Presence of preexisting medical conditions, having a past history of postpartum morbidities and not attending the antenatal clinics regularly were found to be significantly associated with the occurrence of postpartum morbidities ($p < 0.05$). Delivery by caesarean section / mode of delivery and being overweight was not associated with the occurrence of postpartum morbidities ($p > 0.05$).

Conclusion:
A considerable proportion of mothers who deliver at Teaching Hospital Mahamodara develop postpartum morbidities. Strengthening the antenatal care and identification and optimum management of preexisting conditions would improve the postpartum outcomes.

Keywords:
Postpartum morbidities, antenatal care, preexisting medical conditions, mode of delivery.

S_PP2
Prevalence and predictors of premature rupture of membranes among the pregnant women admitted to Teaching Hospital Mahamodara

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Background:
Premature rupture of membranes (PROM) is generally considered as spontaneous membrane rupture with leakage of amniotic fluid prior to the onset of labour. It can be seen in 10% of all pregnancies and around 84% occurs at term. PROM leads to significant maternal and neonatal morbidity. However, there is severe scarcity of data on PROM in Sri Lanka.

Objectives:
This study was carried out to determine the prevalence and predictors of premature rupture of membranes among the pregnant women admitted to Teaching Hospital Mahamodara (THM).

Methods:
Hospital based unmatched case control study was conducted using 240 subjects (160 controls and 80 cases) admitted to THM. Data was collected using a pretested interviewer administered structured questionnaire. The variables were pre-defined. Prior to gestational age of 28 weeks considered preterm. Chi-square and binary logistic regression models were used to identify the association between dependent and independent variables.

Results:
Among the 80 pregnant women in the mothers with PROM, 77 were between 20-41 years of age and among 160 pregnant women in the control group 158 were between 20-41 years of age. Others were between 41-50 years of age. Prevalence of PROM among mothers above 28th week of gestation attending to THM was 8.43%. Preterm PROM accounts for 2.88% whereas term PROM accounts for 5.57%. With high odds, recurrent urinary tract infections (OR:2.8, 95% CI: 1.379-5.722, p=0.004) and gestational age (OR:3.141, 95% CI: 1.662-5.936, p=0.001) were positively associated with PROM.

Conclusions:
Recurrent urinary tract infection and gestational age have shown positive associations with PROM. Thus, this study emphasizes the importance of early detection and treatment of urinary tract infections in pregnancy to avoid complications of PROM.

Keywords:
Preterm premature rupture of membranes, Risk factors, Teaching Hospital Mahamodara, Galle.

S_PP3

Characteristics related to snakebite injuries and their management at Teaching Hospital Karapitiya(THK): A comprehensive audit using a digital data management system

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Background:
Snakebite injury is a common cause hospital admission but neglected tropical disease condition. Southern Province shows a high incidence of snakebites; there have been limited previous in-depth evaluations and surveys regarding snakebite risk characteristics.

Objectives:
To highlight characteristics and related complications of different snakebite injuries to give an expanded view.

Materials & methods:
All the snake bite injuries admitted to THK during 2020 were analyzed, including direct and transferred admissions. A questionnaire was developed and validated. A Google® form was developed to manage data digitally, including demographic data, first-aid, do's and don'ts in snake bites, mode of transport, snake specimen availability, hospital management, complications and their management etc. Isolated clinical records were read page by page by one author while another completed the Google® form. Data were verified by switching the jobs between team members, and the quality of data entry and feasibility was assessed by the supervisor.

Results:
The majority (66.2%) of snakebite victims were males, and a significant number were also from the productive age group (19-60yrs; 61.9%). 47.15% of snakebites were field workers. The tendency of exposure to venomous snakes was higher in field workers (68.08%) than in non-field workers ($p<0.05$). Only 42.7% of victims could identify the bitten snake. Most (38.79%) of the admissions were due to hump-nosed viper bites. Only 37.7% of victims developed envenoming symptoms. The presence of other chronic co-morbidities did not increase the risk of complications after snakebite injuries ($p>0.05$). Delay in hospital admission had been a cause for developing complications ($p<0.05$). An expert said that the digital-data-management system was feasible.

Conclusion:
Snakebite injury has become an occupational hazard affecting field workers mostly. Inability to identify the causative snake prolonged the hospital stay. Most venomous snakebite injuries ended up without developing systemic complications. A digital data collection system is feasible.

Keywords:
Characteristics, snakebite injuries, management, Teaching Hospital Karapitiya

S_PP4
Post vaccination side effects of COVISHIELD vaccine among Medical Officers of Teaching Hospital Karapitiya

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Background:
The COVISHIELD vaccine was provided for the healthcare workers to maintain optimum performance in service during the COVID 19 pandemic. However, the vaccine exhibited a notable amount of side effects, which affected the public opinion on the vaccine.

Objectives:
To describe various side effects caused by the COVISHIELD vaccine among the medical officers of the Teaching Hospital Karapitiya.

Methodology:
A descriptive cross-sectional study was carried out among all medical officers working at Teaching Hospital Karapitiya. Study sample included 390 individuals who obtained COVISHIELD vaccine. Data was collected using a self-reported questionnaire. Vaccine side effects were categorized as very common, common and uncommon based on COVISHIELD fact sheet for vaccine recipient issued by serum institute of India.

Results:
Out of 390 medical officers who took part in the study 389 had received both doses of the vaccine. The proportion of medical officers who experienced side effects with the first dose was 97.9%, and 72.3% with the second dose. The commonest side effects were local injection site symptoms. Both common and uncommon side effect categories showed a similar pattern between the two doses. In both categories 18.5% of the population experienced side effects with the first dose and 1.3% with the second dose. Severe adverse events were observed in a minor percentage (<1%) in both doses. More side effects were observed in younger recipients
®= -0.153; p=0.002) and females (t = 2.49, p=0.0132) with the first dose. No such associations were observed with the second dose. Concurrent comorbidities did not have a significant association with the side effects experienced in the first dose(p=0.5552) or the second dose (p=0.3721).

Conclusion:
More side effects were observed after the first dose. Age and gender were significantly associated with the number of side effects in the first dose, while concurrent comorbidities had no effect on the number of side effects.

Keywords*:*
Side Effects, COVISHIELD Vaccine, Medical Officers, COVID 19

S_PP5
Visual disorders among medical undergraduates of Faculty of Medicine, University of Ruhuna

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Background:
A good vision is important for a successful academic career as a medical undergraduate. According to the literature, it was identified medical undergraduates were having a higher prevalence of visual disorders.

Objectives:
To assess the prevalence, contributory factors, and association of visual disorders with the academic career of medical undergraduates of Faculty of Medicine, University of Ruhuna (FOM).

Methodology:
In cross-sectional study all the undergraduates of FOM (1154) were invited to participate via notices. Data was collected through a pretested standard online questionnaire assessing the state of the vision, contributory factors, impact on education and online visual testing. Participants were requested for an onsite visual screening program.

Results:
The total number of participants in the study was 430 (the response rate was 56.28%). Majorities were females (71%) from the 19-24 age group (67.4%). Around 9% (n=38) of undergraduates participated in the onsite visual screening. Online assessment revealed that 191 (44 %) were previously diagnosed and onsite testing newly detected 10 (2.3%) undergraduates with visual disorders. Most prevalent visual disorders were myopia (36%), hyperopia (6%), and astigmatism (2%) and colour vision deficiency (CVD) (0.4%). 1.6% of males were detected with CVD. Worsening of visual impairment was reported by 32% of the participants previously diagnosed with visual disorders. The family history of visual disorders was significantly higher among the undergraduates with visual disorders (51.8% vs 41.4% $p = 0.031$). The affected undergraduates reported a significant association with their academic work including difficulties during practical classes, lectures and examinations ($p < 0.0001$).

Conclusion:
There was a high prevalence of visual disorders among undergraduates of FOM. Majority of the affected undergraduates reported family of visual disorders and a significant impact on their academic career.

Keywords: *Visual Disorders, Medical Undergraduates, University of Ruhuna, Sri Lanka.*

S_PP6
Risk factors for fractures following road traffic accidents; a hospital based Case control study at Galle district

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Background:
Fractures following road traffic accidents (RTAs) represent significant cause of morbidity worldwide. It is important to assess risk factors, to prevent morbidities following RTAs.

Objectives:
To assess risk factors for fractures following RTAs among patients admitted to Emergency Trauma Centre (ETC) at Teaching Hospital, Karapitiya (THK).

Methodology:
A hospital-based case control study was conducted among a total sample of 142 patients (case: control ratio was 1:1) who were admitted to ETC at THK. Patients admitted with fractures following RTAs were defined as cases while without fractures were defined as controls. Possible risk factors for fractures following RTAs were identified through literature based on Hadden matrix and assessed using an interviewer administered questionnaire. Odd Ratio (OR) with 95% Confidence Interval (CI) was used to identify the statistically significant risk factors using univariate analysis.

Results:
Out of total sample, majorities were males (62.7%), less than 60 years (72.5%), employed (52.8%) and married (66.9%). Majority of cases (73.2%) had simple fractures while nearly 17% had compound fractures. Male gender (OR=3.3, 95% CI=1.6-6.7) and being employed (OR=2.4, 95% CI=1.2-4.6) were identified as statistically significant sociodemographic risk factors. Careless behavior during driving (OR=2.7, 95% CI=1.4-5.5) was identified as a statistically significant human related risk factor while high speed (OR=2.5, 95% CI=1.3-5.0) was identified as a statistically significant vehicle related risk factor. Disturbed busy environment (OR=1.3, 95% CI=0.6-2.4), accidents happened in roads rather than junctions (OR=1.5, 95% CI=0.7-3.2) and accidents happened at nighttime (OR=1.6, 95%CI=0.8-3.1) were identified as environmental risk factors, but they were not statistically significant.

Conclusion:
Multiple factors were identified as risk factors for fractures following RTAs. These factors need to be considered to plan preventive strategies for fractures following RTAs. In view of increasing number of road traffic accidents, the findings of these studies should be emphasized and analyzed further, and relevant interventions should be implemented.

Key words:
Road Traffic Accidents, Risk factors, Fractures, Hadden matrix

S_PP7

Awareness, attitudes, and practices on COVID-19 preventive measures among patients above 50 years visiting medical clinics at Teaching Hospital Karapitiya

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Background:
Emerging SARS corona virus 2 infection has become a global pandemic and it leads to serious complications substantially in elderly population. The preventive measures which block the transmission of the infection is the most judicious aspect to minimize the spread of the infection and associated morbidity and mortality.

Objectives:
This study was carried out to assess the awareness, attitudes and practices on COVID-19 preventive measures among patients above 50-years visiting medical clinics at Teaching Hospital, Karapitiya.

Methodology:
A cross-sectional study was conducted among 384 study participants above 50-years attending medical clinics at Teaching Hospital, Karapitiya. Data regarding awareness, attitudes and practices on COVID-19 preventive measures were collected through an interviewer administered questionnaire and analyzed using SPSS (version 26). The participants who scored more than mean percentage value in awareness (70%) attitudes (45%) and practices (45%) were regarded as satisfactory. Chi-square test was used to identify the associations between variables at 0.05 significant level.

Results:
The mean age of the study population was 62.6 years (SD =± 8.7) and 40.6% were monthly clinic attendees. Majority were females (54.7%) and 52.1% had passed GCE O/L. A total of 51% had better awareness and 56.3% had satisfactory practices whereas only 44.8% had good attitudes towards COVID-19 preventive measures. Higher educational status was significantly associated with better awareness (p=0.000) and satisfactory level of practices (p=0.018). Similarly, better awareness of the participants was significantly associated with satisfactory levels of both attitudes (p=0.000) as well as practices (p=0.000). Gender, age, marital status and frequency of hospital attendance did not show any association with awareness, attitudes and practices.

Conclusions:
Overall awareness and practices regarding COVID-19 preventive measures were satisfactory while attitudes were not adequate. Regular health educational programmes will be helpful to enhance awareness, which in turn improve attitudes and practices.

Keywords:
Awareness, Attitudes, COVID-19, Preventive Measures, Teaching Hospital Karapitiya

S_PP8

Prevalence, causes and maternal awareness of clinically significant jaundice among neonates born at Teaching Hospital, Mahamodara: a cross-sectional study

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Background:

Neonatal jaundice (NJ) is a condition experienced by a majority of neonates which can be resolved without complications. However, clinically significant jaundice may be pathological which requires early intervention for better prognosis.

Objectives:

To evaluate the prevalence of clinically significant neonatal jaundice (CLNJ) and describe the day of detection, maternal awareness, aetiological causes and interventions of NJ among the neonates born at Teaching Hospital, Mahamodara(THM).

Methodology:

A hospital-based cross-sectional study was conducted including 429 neonates born at THM and their mothers recruited by convenient sampling. An interviewer-administrated questionnaire was used, with a predesigned scoring system to assess maternal awareness on NJ. Chi-square test was used to assess the associations between variables with a significance level of 0.05.

Results:

Prevalence of CLNJ among 429 neonates was 14.2%. Out of the mothers, 74.9% were housewives, and 54.1% were educated beyond O/L. Only 81.4% of mothers were aware on the fact that any baby could get NJ. Most (75%) assumed lack of breastfeeding could cause NJ and only 36% knew blood group incompatibility could also cause NJ. Most mothers (55.2%) assumed the outcome of NJ was poor. Maternal awareness of NJ was significantly associated with their educational level ($p=0.01$) and occupation ($p=0.002$); working mothers were more aware of NJ than housewives. Only 35% of mothers had been educated about NJ during antenatal period. Most of the CLNJ resolved with phototherapy (96.7%) but 3.3% required exchange transfusion. Lack of breastfeeding was given as the main cause (60.6%) while 19.7% were not informed about the cause of jaundice.

Conclusions:

A considerable percentage of neonates in the study sample had CLNJ. The awareness of NJ among mothers were satisfactory. Maternal awareness of NJ is significantly associated with maternal socio-demographic characteristics.

Keywords:

Clinically Significant Jaundice, Neonate, Prevalence, Maternal Awareness

S_PP9

Modification of risk behaviours of post-myocardial infarction patients attending the cardiology clinic in Teaching Hospital Karapitiya

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Background:
There was an increasing trend in hospitalizations due to myocardial infarction (MI) in Sri Lanka from 2014 to 2017. Risk factors for MI include advanced age, male gender, family history, smoking, hypertension, diabetes mellitus, dyslipidemia, obesity, sedentary lifestyle etc.

Objectives:
To study the changes of behavioural risk factors after an acute MI in patients attending the cardiology clinic in Teaching Hospital Karapitiya, Sri Lanka.

Methods:
The study was conducted in the cardiology clinic, teaching hospital, Karapitiya as a cross-sectional study on patients with a history of MI. Patients diagnosed with ST elevation MI or non-ST elevation MI during the period of a window from last 6 months to 2 years were recruited. Three behavioural risk factors were assessed (physical activity, smoking and alcohol consumption) and a qualitative assessment of dietary risk factors before and after MI was done, using an interviewer-administered questionnaire. Ethical clearance was obtained from the Ethics Review Committee of the Faculty of Medicine, University of Ruhuna.

Results;
Total of 130 patients with a mean age of 58.03 years (SD 13.02) were studied (77 Males -59%). Physical activity level had reduced in 88.37%, increased in 10.08% and not changed in1.55% of patients during post-MI period compared to pre-MI. Among males, corresponding values were 88.1 %, 10.56% and 1.31%, respectively while among females the values were 88.6%, 7.5 % and 1.88 %, respectively. After the MI, 64% ceased smoking while 68% avoided passive smoking and smokeless tobacco intentionally.
Fifty-five per cent of alcohol users had totally stopped alcohol consumption while 1.44% had increased consumption. More than 60% of females and more than 50% of males modified their dietary behavior after attending the clinic.

Conclusions:
Overall reduction in physical activities, smoking and alcohol consumption is observed in patients suffered a heart attack in the past.

Key words:
Myocardial Infarction, Physical activity, Smoking, Alcohol consumption, Dietary behavior

S-PP10

Prevalence and characteristic features of sudden natural adult deaths referred to Judicial Medical Officer's office, Teaching Hospital Karapitiya

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Background:
A sudden natural death is a death due to a natural disease occurring within 24 hours of the onset of symptoms and is one of the leading causes of death.

Objectives:
To identify the prevalence of sudden natural deaths (SNDs) and assess characteristic autopsy features reported to the Judicial Medical Officer's (JMO`s) Office, Teaching hospital Karapitiya (THK).

Materials and methods:
A retrospective cross-sectional study was conducted at the Judicial Medical Officer's Office, THK. All medicolegal autopsy records of SNDs among those aged more than 18 years and registered during the first six months in 2021 were included. The data were analyzed using Statistical Package for the Social Sciences (SPSS).

Results:
Out of 1605 deaths registered at the JMO`s office, THK during the first 6 months in 2021, 315 were SNDs, thus the prevalence was 19.2%. Male gender predominance was identified (58.1%). Cardiovascular system cause was recorded in 48.3% of deaths while deaths due to respiratory system in 37.8%, central nervous system in 7.9%, genitourinary system in 2.8% and gastrointestinal system in 2.2%. The commonest causes involved was COVID pneumonia, hypertensive heart disease and coronary artery disease. Hypertension, diabetes mellitus and ischemic heart disease are major predisposing factors.
The main system affected was cardiovascular system. There was a significant association between age and occurrence of brain disorders in SNDs. Cause of death involving brain is higher (23.8%) in people less than 50 years, whereas it is low in people more than 50yrs. (6.8%) ($p=0.00001$).
There was statistically significant association between hypertension ($p=0.00233$) and diabetes mellitus ($p=0.000137$) as comorbidities and SNDs occurred due to diseases involving cardiovascular system. As predisposing diseases pose a risk to SNDs, maintaining healthy lifestyle, prevention and proper management of comorbidities are significantly important

Conclusion and Recommendation:
One fifth of the deaths reported to THK were following SNDs with slight male predominence. The main cause of SNDs was COVID pneumonia which may be due to prevailing pandemic situation at the time of conducting the research.
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Key Words:
Sudden Natural Deaths, Medico Legal Autopsy, Cause Of Death, Characteristic Features

S_PP11

Knowledge and perceptions on glaucoma among the patients with glaucoma attending the eye units of Teaching Hospital Karapitiya

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Background:
Glaucoma is an optic neuropathy which can progress to sudden blindness. Therefore, knowledge and perceptions about glaucoma and its treatment are important in preventing its complications.

Objectives:
The objectives were to assess the knowledge and perceptions of glaucoma and its treatment among the patients with glaucoma attending the Eye Units of Teaching Hospital Karapitiya (THK)

Methods:
This was a cross-sectional study conducted on 224 adult patients attending the Eye Units of THK. Data on knowledge and perceptions were collected using an interviewer-administered questionnaire after obtaining informed written consent. Scores for knowledge and perceptions were formulated.

Results:
Majority of the patients were males (54.5%) & most of them were in the age range of 60-69. Higher fractions were educated up to GCE/ Ordinary level (76.3%), with a poor monthly family income (67.4%), with a disease duration of less than 5 years (58.5%) and on regular clinic follow up (79. 0%).Among patients higher percentage of males had good knowledge (59.8%) and higher percentage of females had positive perception (55.9%) on glaucoma. Higher education level (p=0.001), good family income (p=0.036) & regular clinic attendance (p=0.009) showed positive association with adequate knowledge while age (p=0.001), higher education level (p=0.001) & good monthly income (p=0.003) were positively associated with perceptions.
Scores for knowledge ranged between 0 -15 with a mean(SD) of 7.9(3.7). The majority (57.6 %) had a good knowledge score (score ≥ 7.9) Scores for perception ranged from 0 to 30 with a mean (SD) of 22.7(5.4). The majority (52.7%) had a positive perception of the disease and its management (score ≥ 22.7).

Conclusion :
The majority of the patients showed adequate knowledge & positive perception on glaucoma and its management.

Keywords:
Glaucoma, Knowledge, Perception

S_PP12

Knowledge, attitudes and practices on early childhood care and development among mothers of children aged up to five years in Bope-Poddala Medical Officer of Health area

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Background:
Early Childhood Care and Development (ECCD) is the foundation for the holistic development of children which largely determines their future. Parents play a major role in ensuring good ECCD.

Objectives:
This study was carried out to assess the level of knowledge, attitudes and practices on ECCD among mothers of children aged up to five years-attending child welfare clinics (CWCs) at Bope-Poddala health unit area.

Methods:
A cross-sectional study was carried out, recruiting a sample of systematically selected 425 mothers of children aged up to five years attending the CWCs conducted by Bope-Poddala MOH office. A self-administered questionnaire was used to collect data on socio-demographics, knowledge, attitudes and practices on ECCD. A scoring system was used to categorize the knowledge, attitudes and practices on ECCD and a mean percentage score =>75% was considered as satisfactory. Data were analyzed using SPSS version 26.0. Descriptive statistics and chi-square test were used. Ethical approval was obtained from the Ethical Review committee of Faculty of Medicine University of Ruhuna.

Results:
The majority of the mothers were Sinhalese (n=389, 91.5%) and were educated above grade 11 (n=281, 66.1%). Sixty two percent (n=264) of mothers had satisfactory overall knowledge on ECCD and 56.5% (n=240) showed satisfactory attitudes. Almost all the mothers (n=415, 97.6%) had satisfactory practices on ECCD. A higher proportion of mothers had satisfactory knowledge on feeding and nutrition (n=384, 90.4%) and early stimulation and learning (n=383, 90.1%), compared to the knowledge on developmental milestones (n=133, 31.3%). A higher proportion of mothers had high satisfactory level of practices on infant feeding and nutrition (n=381, 89.6%), health status of the child (n=405, 95.3%), early learning and stimulation (n=421, 99.1%) and safety and security of the child (n=366, 85.4%). The knowledge on ECCD was significantly associated with maternal age ($p= 0.001$), monthly income ($p < 0.001$), occupation of the mother ($p=0.016$) and educational level of the mother ($p<0.001$). A satisfactory practice on ECCD was significantly associated with the educational level of the mothers ($p< 0.001$).

Conclusion:
The overall knowledge, attitudes and practices on ECCD among mothers in Bope-Poddala MOH area were satisfactory. However, the knowledge on development of the child was suboptimal. The major source of information on ECCD was PHM followed by the family and friends and the clinic conducted by the MOH clinics. The majority of the mothers of children up to five years of age in Bope-Poddala health unit area have favorable attitudes and satisfactory practices towards ECCD.

Keywords:
Early Childhood Care and Development, Bope-Poddala Health Unit Area, Knowledge, Attitudes, Practices.

S_PP 13
Food purchasing behaviors and associated factors among consumers in Bope-Poddala health unit area

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Background:
Assessing the food purchasing behaviors and correlates of unhealthy purchasing practices among consumers is an essential for promoting nutritional health of a population.

Objectives:
To assess selected food purchasing behaviors and associated factors among consumers in Bope-Poddala health unit area

Methods:
A cross-sectional study was conducted among 361 individuals in Bope-Poddala area using cluster sampling. Data were collected using an interviewer-administered questionnaire and analyzed using SPSS software. Awareness of food labeling in relation to making healthy food choices was assessed using a scoring system. Factors associated with food purchasing practices were assessed using chi-square test.

Results:
62.9%of the sample was females. Most frequently purchased food items (fish, meat, bakery products, beverages, fruits and vegetables) were purchased from the market, bazar or fairs and purchasing frequency was 2-3 times per week. Decision on purchasing food was based on personal opinion among 56.5% while least proportion relied on neighbors and friends' opinion. The 64.8%considered about the cleanliness of the shop when choosing a place of purchase, followed by quality of the food products in the shop. Interestingly, 86.4% of the participants considered promotions which give away gifts for purchasing. Only a 16.6% proportion considered about food advertisements.

A 94.1% of the participants had a good awareness of food labeling and 50.4% used food labels when making healthy food choices. Unhealthy purchasing behaviors (Nutritional information, Ingredients, Traffic light system, Quality certificate and Expiry date) were observed in 49.6% of the participants. The age, gender, educational level, occupation and the monthly income of the participants did not show statistically significant associations with consideration of food labeling or unhealthy food purchasing.

Conclusion:
A considerable proportion of the consumers have unhealthy food purchasing behaviors. Nutrition education programmes should be conducted targeting the promotion of healthy food choices and importance of reading food labels.

Key words:
Food Purchasing Behaviour, Unhealthy Food, Food Labeling,

S_PP14

Association of food beliefs with weight gain during pregnancy and selected sociodemographic characteristics of pregnant mothers in Southern Sri Lanka

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Background:
Unscientific beliefs on food, diet and nutrition among pregnant mothers may adversely affect the nutritional status of both mother and the baby. These beliefs can be influenced by the sociodemographic factors.

Objectives:
The objectives were to describe the beliefs related to food and nutrition and their association with the selected sociodemographic factors and the weight gain during pregnancy among pregnant mothers admitted to Teaching Hospital, Mahamodara.

Methodology:
This was a descriptive cross-sectional study which included 325 pregnant mothers in their third trimester. Data were collected through an interviewer-administered questionnaire and weight gain during pregnancy was measured by using the weight at the first clinic visit and weight at the end of 3rd trimester before the delivery. Demographic data and information about locally popular food beliefs were gathered. A scoring system was made to figure out how many pregnant mothers had unscientific beliefs regarding food and nutrition during pregnancy. Twelve common unscientific beliefs were selected. The participants who marked the response "yes" received one point for each statement. Total score of each mother was calculated and the average was six points. Higher score reflects holding to more unscientific beliefs. Chi-square test and Pearson correlation were used in data analysis.

Results:
Majority of the mothers (36.3%) belonged to the age category of 29-33 years and was from Galle district (80%). Among them, 56% were educated above grade 11 and only 25.2% were employed. Weight gain was adequate in majority (72.3%) at the end of the third trimester. Among their opinions; believing on induction of abortion by eating raw pineapple and raw papaw-78.8%, development of fair complexion in the baby when mother consumes certain food-62.5%, improvement of milk supply of the mother by eating certain food- 88.3% were rated highest. Score for beliefs were lower than average in 50.8 %, indicating that majority did not hold unscientific beliefs regarding food and nutrition during pregnancy. There was no significant association between beliefs score and age ($r=0.025$), and weight gain ($p=0.412$). Further, there was no association between their level of beliefs and educational level ($p=0.212$) and, occupational status ($p=0.264$).

Conclusion:
Unscientific food beliefs were common among pregnant mothers. However, it is not associated with the age, educational level, occupational status and weight gain during pregnancy.

Keywords:
Food beliefs, Pregnancy, Socio-demography, Weight gain

S_PP15

Factors affecting hand hygiene practice at work environment among the garment factory employees in Free Trade Zone Koggala

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Background:

Practising proper hand hygiene is important to prevent the transmission of Covid-19. Garment factory employees represent the main workforce for country's economy however are considered as a high-risk population for Covid -19 due to the crowded workplace environment.

Objectives:

To evaluate the factors affecting hand hygiene practice at work environment among the garment factory employees in the Free Trade Zone, Koggala.

Methodology:

A descriptive cross-sectional study was conducted among five selected garment factories in the Free Trade Zone, Koggala. Consecutive convenient sampling was adopted and the data on hand hygiene practice were assessed using a self-administered, pre-designed questionnaire based on five major parameters described in WHO hand hygiene self-assessment framework guideline (2010) and a cut-off value above 50 or more out of 100 was considered as satisfactory hand hygiene practice.

Results:

Of 384 garment employees, 80% were female and the median (IQR) age was 28 (25-35) years. The self-reported hand hygiene practice was satisfactory among 81.3%. Sanitizers were frequently available facility (97.1%) while the availability of continuous water supply was reported to be 89.1%. Twenty five percent reported as recovered from Covid -19 infection and 31% had been quarantined. No statistically significant association was found between hand hygiene practice and age, gender or Covid-19 status. With regard to the informative resources in the workplace, the availability of notices/posters and provision of leaflets were associated with satisfactory hand hygiene practice ($p < 0.05$).

Conclusion and Recommendation:

The majority of garment factory employees in the Free Trade Zone, Koggala had a satisfactory self-reported hand hygiene practice and it is important to provide informative resources at the work place. Ensuring the provision of the continuous water supply is a timely need for the sustainability of good hand hygiene practice in the prevention of Covid -19 transmission.

Key words:

Hand hygiene practises, Covid 19, Garment factory employees

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