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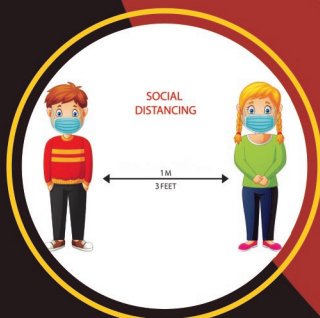
Number 01



Wear your Mask



Wash Your hands



Keep Distance



KEEP SRI LANKA SAFE FROM THE CORONAVIRUS



Ruhuna Journal of Medicine

Proceedings of the Faculty of Medicine Academic Sessions (FMAS) 2021, University of Ruhuna

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Cover story: Protect yourself and others around you by following the healthcare guidelines and maintaining the necessary precautions during this pandemic



VT Kasun De-Mel who won the competition for the cover page for the Ruhuna Medical Journal 2021, is a 2nd year Medical undergraduate at the Faculty of Medicine, University of Ruhuna. He is also a graphic designer, animation and video editor, a computer programmer and app developer. He hails from Negombo and had his primary and secondary education at St. Peter's College Colombo.

Thousands of lives are lost during the war against COVID-19. If we obey the healthcare guidelines and take the necessary precautions as a whole, we can avoid a disaster and survive this pandemic.

Wearing a mask is crucial as masks can help to prevent the virus from spreading from the person to person. Masks alone do not protect against COVID-19 but maintaining physical distancing, hand hygiene and cough etiquettes are needed. Further, being vaccinated against COVID-19 saves lives by preventing getting the severe disease. Therefore getting the first vaccine that becomes available to you is important.

It is our responsibility to prevent the spread of COVID-19 to overcome this pandemic.

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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), Keywords, 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 legends.

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. [1, 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 Plan* 2012; 27(1): 281-287. (eg. BMJ type)

Books: Aminoff MJ. *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 is with great privilege that I send this message on behalf of the organizing committee of Faculty of Medicine Academic Sessions, FMAS 2021. The theme selected for this year's academic sessions “Navigating challenges for a healthier and secure tomorrow” is timely, as we all struggle to regain normalcy in our day today lives while facing many challenges during the current COVID-19 pandemic.

The keynote address, oration and the symposium will provide inspiration to academic staff and students on how to overcome challenges on multitude of disciplines today to secure a better tomorrow. We are privileged to have two eminent and distinguished speakers who will deliver the keynote address and the oration. I sincerely thank the esteemed foreign and local faculties for their contribution towards the symposium. Presentations based on completed postgraduate studies and the free paper sessions provide a platform for both undergraduates and postgraduates to disseminate their knowledge and showcase their discoveries. We believe that the undergraduates will utilize the opportunity given to them to improve their presentation skills and be motivated to do more research in the future by presenting their research findings at the FMAS 2021.

I wish to express my gratitude to the Vice Chancellor, University of Ruhuna and Dean, Faculty of Medicine and the organizing committee of FMAS 2021 for their unyielding support to make this event a reality. I sincerely believe that this year's academic sessions will be an intellectual platform for academics as well as students to harness knowledge to be more creative and innovative in research in the future.

Professor Ruwani Hewawasam
Chairperson, FMAS 2021

Message from the Vice Chancellor



Navigating challenges for a healthier and a secure tomorrow

It gives me great pleasure to send this message to FMAS 2021 during a critical period in the history of mankind. The theme Navigating challenges for a healthier and a secure tomorrow is relevant and timely. The entire world has gone through two difficult years with the pandemic of Covid-19. Even organizing an event like this is a huge task. I wish to congratulate the Dean and the organizing committee for achieving that target.

At the moment Sri Lanka and the world is moving forward with the control of the Covid-19 with the vaccination programme. However, the world is not going to be secure or safer or healthier sooner or for several years to come. The medium and long term consequences of the pandemic including organ related late complications of Covid-19, mental health issues of the protracted lockdowns, loss of loved ones are emerging and worse is yet to be seen.

The human development indicators have lost the predicted trajectories. The economic recovery will take decades to catch up. Therefore, it is important to learn lessons from this pandemic and go back in history to learn more. Nobody would remember the Spanish flu but most senior generation in the world might remember WW II. We have heard stories of WW II. The hard life with food control with shortages, taxes, life style restrictions have been part of it. Perhaps all countries, in the world experienced it.

Reality during this pandemic showed that all countries in the world are vulnerable to shocks and disasters. However, the vulnerability levels are different and obviously low and middle income countries are worse affected. This is true even for social strata. The marginalized and underserved in a more routine context have proven to be more vulnerable. I am certain that all professional organizations have realized it.

The dialogue should be on how we should manage these challenges of the post Covid-19 as a low /low middle income country. Thereafter, we must invest on long term projects to resolve the failures of the last century that resulted in the current calamities which produced discriminatory individual and societal outcomes of the Covid-19 and post Covid-19 environment. The attempts at spending on short term gains must be minimized as much as possible.

The world will never be secure or healthier until the entire world is safe and clean. The experience and research have shown that unpalatable policy changes to address the gaps in vulnerabilities must be made as an urgent measure. The concept of “Progressive Universalism” must be implemented with welfare targeted towards the absolutely needy. The focus of welfare must be shifted more towards human capital development for the country selected from marginalized underserved populations for affirmative action. I hope these comments would be given a serious thought during the proceedings of the conference.

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

Senior Professor Sujeewa Amarasena
MBBS(Ruh), MD(Paed-Col), DCH(Col), DCH(Sydney), FSLCPaed
Vice Chancellor, University of Ruhuna

Message from the Dean



It is with satisfaction and enthusiasm that I send this message to the Faculty of Medicine Academic Sessions FMAS 2021. The satisfaction is that we are being able to organize this event to make it a reality under the prevailing uncertainties due to the pandemic. One important lesson that we all learned from the pandemic is that everything is uncertain and not predictable. Probably all of us knew that there are lot of uncertainties in our existence, but by living through the pandemic we realized that this uncertainty is a certainty which is always there. With that reality we realized that there is no room for us to postpone or cancel any of the important events in our academic calendar as a faculty. I appreciate the enthusiasm and interest shown by the Faculty to organize this event without any hesitation under the trying conditions. I feel proud about this attitude and identify it as a strength in our faculty which will inspire our students as well.

The theme of the sessions "Navigating challenges for a healthier and a secure tomorrow" is very relevant to the time period in which the sessions are being held and thereafter as well. There are eminent invited speakers who will share their knowledge, experience and wisdom with us and I am sure that all of us will benefit a lot. This event will provide an opportunity for the academics and the students to be on the same platform to share their knowledge.

My enthusiasm is based on expectations of a very well organized academic activity which will broaden our horizons in scientific knowledge and in humanity. I am confident of a very well organized academic event irrespective of the platform we are using and changes we have to undergo under the circumstances. I have my confidence on the the outcome as I have seen the interest, commitment and enthusiasm shown by the Chairperson and the Steering Committee in taking up the challenges in organizing the event. I appreciate all the invited speakers for accepting the invitation with all the uncertainties, even without knowing the type of platform on which they are expected to participate. I am grateful to the Vice Chancellor and all the academic staff members, the administrative staff, technical staff and the other staff members, medical students and all the others who are with us in this process from the beginning.

I congratulate the Chairperson, Steering Committee and the Members of all the Committees who worked hard to make the FMAS 2021 a reality.

Professor Vasantha Devasiri

MBBS(Ruh), DCH(Col), MD(Paed Col)

Dean Faculty of Medicine

University of Ruhuna

Faculty of Medicine Academic Sessions (FMAS) 2021

University of Ruhuna

Wednesday 15th December 2021

TW Wikramanayake Auditorium, Faculty of Medicine, University of Ruhuna

Theme: “*Navigating Challenges for a Healthier and Secure Tomorrow*”

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 2021 Professor Ruwani Hewawasam
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 “Paediatric research: A kaleidoscopic personal trail” Dr BJC Perera Specialist Consultant Paediatrician Section Editor Ceylon Medical Journal, Joint Editor Sri Lanka Journal of Child Health
0915-0930 hrs	Deans' Awards 2021
0930-0940 hrs	Event organized by the Faculty Cultural Centre
0940-1020 hrs	FMAS - Oration 2021 “Surgery, Success and Happiness: A story within a story” Professor Mohan de Silva Emeritus Professor in Surgery, University of Sri Jayewardenepura Former Chairman, University Grants Commission, Sri Lanka
1020-1025 hrs	Vote of thanks by the Secretary FMAS 2021 Dr. Achala Liyanage
1025-1030 hrs	National Anthem- Closing ceremony
1030-1050 hrs	Tea Break and Poster Session – I
1050-1230 hrs	FMAS Symposium: "Facing the challenges & shaping the future" COVID-19 and Frontline workers: Overcoming the medico-social challenges Prof. Shehan Williams, Professor in Psychiatry, Faculty of Medicine, University of Kelaniya Food safety – are we really addressing the problem?-Prof. Terrence Madhujith Professor of Food and Nutrition, Faculty of Agriculture, University of Peradeniya Smart medicine in healthcare: A game changer? -Prof. Rifdy Mohideen Department of Internal Medicine, International Medical University, Malaysia Critical appraisal of different types of vaccines used for COVID-19 Prof. Suranjith Seneviratne Consultant in Clinical Immunology and Allergy Royal Free Hospital and University College London, United Kingdom

1230-1330 hrs	<p>Postgraduate research presentations</p> <p>Nutritional status and feeding practices of children with asthma in comparison to healthy children: An observational study in Southern Sri Lanka Dr I Kankanarachchi Department of Paediatrics, Faculty of Medicine, University of Ruhuna</p> <p>Associated factors, outcomes and prevention of birth defects among infants in Southern Sri Lanka Dr J de Silva, Department of Community Medicine, Faculty of Medicine, University of Ruhuna</p> <p>Trans-thoracic Echocardiography in patients with acute ischaemic strokes and normal clinical cardiac assessment Dr PDWD De Zoysa, Department of Medicine, Faculty of Medicine, University of Ruhuna</p>
1330-1400 hrs	Lunch Break and Poster Session- II
1400-1500 hrs	Free paper session- Open category
1500-1600 hrs	Free paper session- Undergraduate category
1600-1630 hrs	Awards ceremony
1630-1645 hrs	Tea

Paediatric Research: A kaleidoscopic personal trail



I stand here in all humility, to present some snippets from research endeavours in a professional life spanning over half a century. Intricacies of how to do research are often repeated *ad infinitum* and *ad nauseam*. Repetition of such would indeed be as futile as carrying coals to Newcastle or trying to sell snow to Eskimos.

Research involves an inquisitive mind and sustained commitment, enhanced by challenges and tempered sometimes by desolation while being boosted often by decisive triumphs. In the Health Ministry, there was no compelling need to undertake research; neither for career advancement nor for any other benefits. For me, it was passion, fuelled by opportunities. My professional trek was often directed through variegated and fortuitous opportunities that led to several research ventures. The word opportunity is the Holy Grail of research, from which you drink your fill. It is an enduring word that I hold sacred.

The seminal impact of research opportunities that I was privileged to explore would be the epicentre of this presentation. Sometimes opportunity knocks just once. At other times we create opportunities embracing all prospects offered. Occasionally opportunities fall at our feet. When opportunities are taken, many more vistas of chance could open up. I hope to take you through a steadfast journey of opportunities taken.

In a multi-phased research ramble, there were rewards as well as brickbats; the former outnumbering the latter. One was delighted to bask in the glory, while the rare criticisms became captivating opportunities to reach even greater pinnacles. Research was also the stepping stone to a cherished calling in medical editorship.

If I were to relive my life again, I would opt for the very same life of research opportunities: a kaleidoscopic trail that I would not trade in exchange for any other.

Dr BJC Perera

MBBS(Cey), DCH(Cey), DCH(Eng), MD(Paed), MRCP(UK), FRCP(Edin), FRCP(Lon), FRCPCH(UK), FSLCPaed, FCCP, Hony FRCPCH(UK), Hony. FCGP(SL)
Specialist Consultant Paediatrician and Honorary Senior Fellow,
Postgraduate Institute of Medicine, University of Colombo, Sri Lanka.
Section Editor Ceylon Medical Journal, Joint Editor Sri Lanka Journal of Child Health

Surgery, Success & Happiness A story within a story



From the times of dark ages, over centuries, the specialty of surgery has travelled overcoming numerous tragedies and setbacks. The practitioners of the specialty too have struggled to adopt themselves to face numerous challenges up to the present era. This oration is an attempt to summate few milestones that have made a lasting impact on the profession that helped the advancement of this fascinating invasive specialty, with a critical analysis of the evolution of its practitioners from the times of 'healers' through the era of the 'autonomous clinicians' and how they adopted to the present-day expectation of a surgeon who demonstrate evidence based clinical excellence and dedication to the practice of safe surgery.

The listener is taken through the impact of land-mark discoveries; antiseptics, antibiotics and anesthesia on the progress of surgical practice and the ancient practices of surgery without ancillary tools, surgeons then relying on detailed anatomical dissections and sharp clinical observations, with evidence.

Surgery by its very nature of invasiveness, carries a risk of unintended harm. The decision making in the practice of surgery is to minimize the risk of this unintended harm and to apply safe management strategies. The oration will take the listener through a critical analysis, how the right balance between the decision to proceed with surgery and the potential harm associated with non-performance is achieved while dissecting the importance of procedural skills including technical dexterity and decision making at every step of a surgical procedure, which is a set of sequential steps that is initially reversible.

The main risks of any surgical procedure, bleeding, anesthetic risk, unexpected events and infection and the key determinants of outcome that can be achieved as a result of a set attributes of a team in which surgeon is the key player but not the only player is analysed. As the magnitude of surgical errors on the outcomes became evident, how the surgical profession responded is presented with the introduction of 'checklists', into the practice of medicine, long thought to be a too complex subject due to many variables. The impact of check list approach to patient safety is presented with research evidence.

As the specialty evolved facing challenges of rapidly changing cutting-edge technology to respond to high expectations of patients, how, surgeons too got evolved from the times of the compassionate clinician with a healing hand to become another service tool, sometimes losing the respect of the society they long served with care and compassion is viewed with a true story of a personal tragedy of a surgeon as a patient.

The lessons that can be learnt from this highly emotional story encompassing Success, Wealth and Happiness is scrutinized towards the last part of the oration as an inspiration to help us, the clinical practitioners to help ease physical and mental sufferings of those we serve.

Professor Mohan De Silva MS, FRCS Edin, FCSSL

Emeritus Professor in Surgery

Faculty of Medical Sciences

University of Sri Jayawardenapura

COVID 19 and Frontline workers: Overcoming the medico-social challenges



The world is waging a war against an unseen but deadly virus for nearly two years with little success. Despite mass vaccination the numbers do not seem to be abating globally. In this uncertain and unpredictable environment, there are many who have been unknowingly and unwillingly thrust on to the frontlines. These frontline workers often underprepared, inadequately resourced and ill equipped have risen to their tasks admirably to battle the COVID-19 pandemic.

It is not surprising therefore that they have a heavy price to pay in terms of risking their own health while also dealing with psychological and social issues that stem from their role in the frontline. Fear, anxiety, burnout, substance dependence, post traumatic stress disorder, depression and even suicide are well recognized. These conditions however, only represent the tip of the ice-berg. Submerged below are the greater issues and struggles related to family, children, peer relationships, interpersonal conflicts, emotional and social isolation, exhaustion, lack of control and even moral injury.

How can we identify and deal with these issues? How do we protect ourselves and those around us? These are the challenges that will be explored in this discussion.

Professor Shehan Williams

MBBS, MPhil, MD, FSLCoP, FRCPsych

Professor in Psychiatry, Faculty of Medicine, University of Kelaniya.

Food Safety: Are we really addressing the problem?



The supply of safe food is of paramount importance to any society. The safety of food is defined in terms of physical, chemical, biological or radiological hazards. The World Health Organization defines food safety as producing, handling, storing and preparing food in such a way as to prevent infections and contamination of food in the food value chain. With economic development, assurance of food safety has become a challenging task. Urbanization, industrialization, environmental pollution, issues of waste disposal, global warming, heavy use of agro-chemicals, the use of new processing and packaging technologies, heavy and haphazard use of food additives and processing aids, rising cost of production, emerging and re-emerging food borne pathogens and parasites, irregularities in imports, poor law enforcement and global pandemic are some of the factors that challenge food safety. Aside from these factors, dishonest operations or food fraud, poor food service sector also contribute to this situation in Sri Lanka.

Food safety management systems have been introduced in order to assure food safety during the past few decades. Many large and medium scale food processors in Sri Lanka have already adopted food safety management systems, however, many small scale food processors do not have the potential to adopt them. Moreover, the irregularities in imports of food, ingredients and inputs for crops and animals have also posed serious threats to supply of safe food. There are many parliamentary acts governing the matters relating to food safety in the country while a number of line ministries such as ministries of health, agriculture and trade are involved in. Currently, there is neither proper food safety policy for the country nor an umbrella organizations to coordinate activities and functions pertaining to food safety. It is high time for the country to formulate a policy on food safety and develop a proper structure to assure a safe food supply for the country.

Professor Terrence Madhujith

Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya

Smart medicine in healthcare: A game changer?



Healthcare is becoming increasingly expensive to cater to a growing and ageing population, to adopt advances in new treatments and technologies and fulfil an increasing public expectation of a more personalised, equitable and convenient health service and provide adequate staff, the biggest cost driver. To this end comes SMART medicine, which refers to “self-monitoring, analysis, and reporting technology”, a technology that uses artificial intelligence, machine learning, and big data analysis to provide cognitive awareness to objects that were in the past considered inanimate. Significant advances in computing and processing power, software, wireless technology and miniaturisation have expanded the possibilities further and created the Internet of Medical Things (IoMT). Today, IoMT is efficiently bridging the gap between the physical and the digital worlds by bringing together people (doctors, patients, nurses, caregivers), data (patient and healthcare performance data), processes (care delivery and patient support), and enablers (connected medical devices, cloud and mobile applications). IoMT solutions can engage and empower patients and carers at the same time lower costs by reducing hospital readmissions, improving medication adherence, and increasing wellness management among many other uses. Formidable challenges are present from healthcare professionals such as trust in the accuracy of data, privacy concerns, training for use in clinical settings and for MedTech companies to achieve interoperability between devices and systems, understanding the end-user, maintaining cybersecurity, and navigating regulatory compliance. Notwithstanding these issues, cost effective purposefully designed smart medicine technology solutions are likely to transform healthcare by improving high quality health outcomes and drive down cost compared to traditional services and improve the wellbeing of many and radically change the way healthcare is delivered to patients.

Professor Mohamed Rifdy Mohideen MD, FRCP, FCCP, FRACP (Hon)

Professor, Internal Medicine at the International Medical University, Malaysia and Emeritus

Professor, Medicine, University of Ruhuna.

Critical appraisal of different types of vaccines used for COVID-19



Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has affected more than 250 million individuals worldwide. Whilst its primary effects are on the respiratory system, COVID-19 has been shown to cause a myriad of manifestations in other organ systems. In addition to the many novel strategies proposed for its treatment, vaccination is an important preventive strategy for reduction of morbidity and mortality in COVID-19. In my talk, I would critically appraise the currently available COVID-19 vaccines and discuss the latest perspectives on mixing COVID-19 vaccines and the use of booster vaccine doses. The use of COVID-19 vaccines in children and pregnancy would also be outlined.

Professor Suranjith Seneviratne

**DPhil(Oxon), MBBS, MD, DPath, MRCPath, MRCP, FRCP,
FRCPath, FCCP**

Professor and Consultant in Clinical Immunology and Allergy

Institute of Immunity and Transplantation and Health Services Laboratories, London, UK

Nawaloka Hospital Research and Education Foundation, Sri Lanka

Nutritional status and feeding practices of children with asthma in comparison to healthy children: An observational study in Southern Sri Lanka

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²Teaching Hospital Karapitiya,

³Department of Community Medicine, Faculty of Medicine, University of Ruhuna

⁴Department of Physiology, Faculty of Medicine, University of Ruhuna

Abstract

Background and Objectives

Asthma is a chronic inflammatory disorder of small airways. It has an impact on childhood nutrition due to the chronic nature of the disease. This study aimed to describe the nutritional status and dietary practices among children aged 5-14 years with and without asthma.

Materials and Methods

A cross-sectional study was done among children with asthma attending paediatric clinics, Teaching Hospital Karapitiya (n=86) and an age sex-matched healthy group of school children in the Bope-Poddala health unit area (n=86). A consecutive sample of children with asthma who met the eligibility criteria was recruited from the clinics. Similarly, a sample of age-sex matched controls was recruited from the school children residing in Bope-Poddala health area using convenience sampling. An interviewer administered questionnaire was used to obtain disease related data and feeding practices. Anthropometric measurements were interpreted using the World Health Organisation (WHO) growth charts.

Results

A total of 172 subjects, ranging from 5-14 years, were enrolled in the study. Of them, 50% (n= 86) were children with asthma. In the disease group and in the healthy group, a normal Body Mass Index (BMI) was found among 37.3% and 57.0% respectively, this difference being statistically significant (p=0.002).

The prevalence of stunting, overweight and thinness in the disease group was 8.1%, 14.0% and 52.3%, respectively. In contrast, the prevalence of stunting, overweight and thinness in the healthy group was 4.7%, 4.7% and 38.4%, respectively. These individual differences showed no statistical significance. Food restriction was significantly high among children with asthma compared to healthy children (p<0.001). Dietary restrictions, inhaled steroid dose, and duration of steroid therapy had no relationship with nutritional abnormalities among children with asthma.

Conclusion

Prevalence of nutritional abnormalities and dietary restrictions were significantly more common among children with asthma than healthy children.

Introduction

Asthma is a chronic inflammatory disorder of small airways, which results in airflow obstruction, and it is commonly associated with recurrent exacerbations (1). The prevalence of childhood asthma in Sri Lanka is 15%-25% (2). Childhood nutrition plays a crucial role in adult height and health outcomes (1). Due to multiple reasons, childhood nutrition is adversely affected by chronic illnesses. Asthma is an illness that can affect childhood nutritional status due to the nature of the disease and its treatment. Firstly, due to cultural beliefs and fear of food allergies, food restriction is common among asthma children (3). Secondly, children with asthma can get impaired linear growth if they are exposed to higher doses of systemic steroids for a longer duration (4).

Furthermore, poorly controlled asthma can result in frequent exacerbations, frequent hospitalization and repeated exposure to systemic steroid therapy (4). On the other hand, obesity is a causative factor for childhood asthma, leading to a complex inter-relationship between the nutritional status and the disease status. One explanation is that fat tissues produces cytokines that might affect the lungs. In addition, changes in innate lymphoid cells function in obese adipose tissue is a known contributing factor to asthma. Further, obese children tend to consume more fat and low fiber. Low fiber is associated with changes in gut microbiome and low levels of short chain fatty acids propionate, which is associated with exaggerated airway inflammation leading to asthma (5,6).

A few research attempts have been undertaken to assess the growth and nutritional status of children with asthma. Scepanovic et al. conducted a study on the nutritional status (BMI) of children with asthma from 6 to 15 years, which showed some form of malnutrition (under-nutrition or over-nutrition) in 34.5% of children with asthma (7), though they have not assessed the contributory factors towards the development of malnutrition in these children. According to Ling Kai et al., 60% of children with asthma were on some form of dietary restriction (3). Association of childhood obesity and asthma was studied by Visness et al. in 2010 based on National Health and Nutrition Examination Survey from 1996 to 2006. The study concluded the obesity is an independent risk factor for non-allergic asthma (5). Lowson et al. in 2013 conducted a case-control study to assess nutritional status and dietary practices among children with asthma. According to this study, obesity was significantly associated with nonatopic asthma. However, none of these studies had looked into feeding practices of children with asthma (6).

Though several studies have been conducted on malnutrition in otherwise healthy children, hardly any research attempts have been undertaken to assess children's nutritional status in chronic illnesses such as asthma, particularly in relation to feeding practices. Thus, the main aim of this study was to determine the

nutritional status and feeding practices of children with asthma and its contributory factors compared to healthy children of the same age and gender.

Materials and methods

Study design, setting and participants

The comparative cross-sectional study was conducted in Teaching Hospital, Karapitiya (THK), Galle, the largest tertiary care Hospital in southern Sri Lanka. The study group included 86 children diagnosed with asthma for a minimum of more than three months' duration, followed up at paediatric pulmonology clinic and general paediatric clinics at THK. A community-based, age-sex matched sample of 86 school children selected from the adjacent health unit area Bope-Poddalawere encompassed in the study as the comparison group. The study was carried out from 2018 to 2020.

Sampling method

A consecutive sample of children with asthma attending Paediatric clinics, TH Karapitiya who met the eligibility criteria was recruited. For each participant in the disease group, an age-sex matched control was recruited from among school going children in the community of Bope-Poddala using convenience sampling.

Method of data collection

A pre-tested interviewer-administered questionnaire was used to obtain demographic details and dietary practices of children. Disease-related data were extracted from the clinic records of individual participants. Birth weight was obtained from the Child Health Development Record (CHDR). Investigators obtained anthropometric measurements using standard protocols. A Stadiometer was used to measure the height, and measurements were taken to the closest 0.1cm. Weight was measured using an electronic weighing scale (Secca R France) to the closest 100g. BMI was calculated by investigators using the standard formula (weight in kilograms /height in meters²). All anthropometric measurements

were interpreted using the WHO growth charts (9). In addition, height for age was also assessed in the study; however, weight for age was not assessed since the WHO growth chart contains reference values for only up to 10 years. Parents were asked whether they curtail any food items due to the illness. Further, they were inquired about the reason behind the restriction of some food items. If the child was not allowed to consume at least one food item due to the disease, it was considered as a form of food restriction.

Data interpretation and analysis

Stunting was defined as height for age $< -2SD$. Based on the BMI value, five categories of nutrition status (severe thinness, thinness, normal BMI, overweight and obesity) were considered. Normal BMI was defined as $-2SD$ to $+1SD$. Thinness and severe thinness were defined as BMI between $-2SD$ to $-3SD$ and $< -3SD$, respectively. Overweight and obesity were defined as BMI between $+1SD$ to $+2SD$ and $> +2SD$, respectively.

Data were analysed using SPSS 21.0 statistical software. Z test for two proportions was used to compare the nutritional status between the asthma group and the comparison group. During the analysis of BMI values, overweight and obesity categories were amalgamated. Similarly, thinness and severe thinness were considered as one group. The Chi-square test was used for all analyses within the asthma group.

A probability level of 0.05 was considered in all analyses except in assessing the association between BMI categories and asthma, where the Bonferroni-adjusted p-value of 0.016 (0.05/3) was used to determine the statistical significance in order to reduce the Type I error as the comparisons between these two variables were performed at multiple levels.

Ethics and consent

Ethical approval for the study was obtained from the Institutional Ethics Review Committee (Ref. No. 17.05.2018/3.1). All participants enrolled voluntarily.

Administrative approval was sought before the implementation of the study. The nature of the study, its' importance, procedures, potential risks and benefits were clearly explained to all participants, and their written consent was obtained in the local (Sinhalese) language. Informed written consent was obtained from the parents, and assent was obtained from children. All records were kept anonymous and confidential by coding. Children with nutritional abnormalities were referred to the nutrition clinic, THK.

Results

The response rate was 100%. Out of 172 children, 61.6% ($n=106$) were males. The mean age was 8.8 ($SD \pm 2.6$) years. The birth weight ranged from 1300g to 4500g. The mean birth weight was 2841.5 ($SD \pm 490.3$) g. There was no difference among the two groups of the maternal educational level. However, the proportion with low birth weight (LBW) in the study group and the comparison group was 34.9% and 16.3%, respectively, the difference being statistically significant ($p=0.018$).

In the study group, the severity of asthma ranged from mild persistent to severe persistent category. The majority of children ($n=80$, 93%) in the asthma group belonged to the mild persistent asthma category. All of them were on steroid inhalers. The majority were on metered-dose inhalers (MDI). In most cases, children were on 200 -400 micrograms/day of steroids dose. The percentage of children who were on montelukast therapy was 11.6% ($n=10$) (Table 01).

The mean age at the diagnosis of asthma was 4.4 ($SD \pm 3.4$) years. The mean age at starting treatment was 5.4 ($SD \pm 3.2$) years. Twenty-nine per cent ($n=25$) of them had at least one asthma exacerbation during the last month, and 39.5% ($n=34$) had at least one hospitalisation due to asthma during the previous year (Table 01).

Table 1: Disease-related data of children with asthma (n=86)

Variable	Number (Percentage)
Asthma category	
Mild persistent	80 (93.0%)
Moderate persistent	5 (5.8%)
Severe persistent	1 (1.16%)
Inhaler device	
Meter dose inhaler	75 (86.0%)
Dry powder inhaler	11(14.0%)
Duration of therapy	
3months -2 years	20 (23.2%)
2-5 years	46 (53.4%)
>5 years	20 (23.2%)
Montelukast therapy	
Yes	10 (11.6%)
No	76 (89.4%)
Number of exacerbations during the last month	
No exacerbations	61(70.9%)
1	18 (20.9%)
≥ 2	7 (8.1%)
Number of hospitalisations during last year	
No admissions	52 (60.5%)
1	19 (22.1%)
2	9 (10.5%)
≥ 3	6 (7.0%)
Inhaled Corticosteroid (ICS) dose (µg/day)	
100	4 (4.7%)
200-400	63 (73.2%)
>400	18 (21.0%)

Table 2: Commonly restricted food and beverages among asthmatic children (n=86)

Type of restricted food and beverages		Number (%)*
1.	Refrigerated food and beverages-	61 (70.9%)
2.	Eggs	33 (38.4%)
3.	Fresh milk	29 (33.7%)
4.	King coconut water (“Thambili”)	24 (27.9%)
5.	Mung beans	23 (26.7%)
6.	Milk rice	23 (26.7%)
7.	Cucumber	21 (24.4%)
8.	Curd	9 (10.5%)
9.	Banana	9 (10.5%)
10.	Watermelons	9 (10.5%)
11.	Papaw	7 (8.1%)

*Percentages do not add up to 100% due to multiple responses

Nutritional status

A BMI in the normal range was observed in 33.7% of children with asthma and in 57% of healthy children, the difference being statistically significant ($p=0.002$). The prevalence of stunting in asthmatic and healthy children was 8.1% ($n=7$) and 4.7% ($n=4$), respectively, though there was no statistically significant difference in the prevalence of stunting in the two groups ($p=0.967$) (Table 03).

The prevalence of severe thinness ($BMI < -3SD$) among children with asthma was 23.3% ($n=20$), whereas, in the comparison group, severe thinness was seen in 15.1% ($n=13$). A similar pattern was observed in the prevalence of thinness ($BMI -2SD$ to $-3SD$). However, the observed difference was not statistically significant at a Bonferroni-adjusted p -value ($Z=1.838$, $p=0.07$). In the disease group, the prevalence of overweight and obesity was 5.8% and 8.1%, respectively. Conversely, only 4.65% of

healthy children had a BMI above the overweight level. However, this difference was not statistically significant at a Bonferroni-adjusted p-value of 0.016 ($p=0.036$).

The proportion with a normal BMI value for age and

sex was higher among the healthy children compared to the children with asthma in this sample ($p=0.0002$). This indicates that nutritional abnormalities are more common among asthmatics compared to healthy children.

Table 3: Comparison of nutritional status of children with asthma and the healthy children

Nutritional status		Asthma group (n=86) (%)	Comparison group (n=86) (%)	p-value
Height	Stunting (<-2SD)	7 (8.1)	4 (4.6)	Z= 0.934
	No stunting	79 (91.9)	82 (95.3)	p=0.352
BMI				
	Severe thinness (<-3SD)	20 (23.3)	13 (15.1)	Z=1.838
	Thinness (<-2SD)	25 (29.1)	20 (23.2)	p=0.07*
	Normal BMI (-2SD to +1SD)	29 (33.7)	49 (57.0)	Z=-3.063
	Overweight (>+1SD)	5 (5.8)	2 (2.3)	Z= 2.101
	Obesity (>+2SD)	7 (8.1)	2 (2.3)	p=0.036**

*For the analysis, thinness and severe thinness amalgamated together

**For the analysis, overweight and obesity amalgamated together

Table 4: Relationship of stunting and overweight with the sex of the child, food restrictions, ICS dose and duration among children with asthma (n=86)

	Height			BMI		
	Stunting No (%)	No Stunting No (%)	Chi-square value (p- value)	Overweight or obesity No (%)	No overweight No (%)	Chi- square value (p –value)
Sex						
Male	2 (3.8)	51 (96.2)	3.5212	7 (13.2)	46(86.8)	0.064
Female	5(15.2)	28 (84.8)	(p= 0.06)	5(15.2)	28(84.4)	(p=0.80)
ICS dose (µg/day)						
200-400	4 (6.1)	61 (93.9)	1.403	7 (10.8)	58(89.2)	2.248
>400	3 (14.2)	18 (85.7)	(p=0.236)	5(23.8)	16(76.2)	(p=0.13)
Duration of ICS						
<3 years	2 (5.1)	37(94.9)	0.865	3 (7.7)	36(92.3)	2.330
>3 year s	5 (10.2)	42 (89.8)	(p=0.35)	9 (19.1)	38(80.9)	(p=0.12)
Food restrictions						
Yes	5(8.1)	57(91.9)	0.159	8 (12.9)	54(87.1)	0.204
No	2 (8.3)	22(91.7)	(p=0.67)	4 (16.7)	20(83.3)	(p=0.65)

Among children with asthma, no statistically significant associations were observed between stunting and the sex of the child ($p=0.06$), the duration of an inhaler therapy ($p=0.23$), the inhaler dose ($p=0.35$) and presence of food restrictions ($p=0.67$) (Table 03). The duration of inhaler treatment and the dose of inhaled steroids did not show any significant association with the prevalence of overweight and obesity (Chi square value- 2.248, $p=0.12$ and chi square value – 2.330/ $p=0.13$, respectively). Similarly, there was no sex preponderance in the prevalence of overweight.

Feeding practices

Food restriction was reported in significantly higher proportions among children with asthma than healthy children ($p<0.001$). Seventy-two per cent ($n=62$) of children's parents have restricted at least one food item due to the underlying disease. In the comparison group, the proportion with at least one or more dietary restrictions was 9.3% ($n=9$). Out of children with asthma, 59.0% of parents restricted food mainly during acute asthma exacerbations, whereas 29.1% of parents practised food restrictions every day.

The most typical reason behind food restriction was the belief in asthma exacerbations due to certain food items. The most commonly restricted food items were refrigerated food and beverages, eggs, fresh milk and king coconut water. (Table 02) However, there was no positive association found between nutritional abnormalities and dietary restrictions in asthmatics.

Discussion

This study's main aim was to describe the nutritional status and dietary habits of children with asthma in comparison to healthy children. In addition, investigators attempted to identify any association between dietary restrictions and nutritional abnormalities. The findings showed that nutritional problems and dietary restriction practices are common among children with asthma compared to the healthy group. However, no association was found between dietary restrictions and nutritional abnormalities.

There was male predominance among children with asthma and which is compatible with many other studies done in the past (10,11).

Since the comparison group was age and sex-matched, the sex distribution was identical to the disease group. Two groups were similar in maternal educational level. Low birth weight (LBW) was more prevalent among children with asthma compared to healthy children. A similar finding was observed by Teumzgiet al. in a cohort of 13734 newborns who concluded that wheezing in later life was positively correlated with low birth weight (12). Another study carried out in Europe by Anger MM et al. showed that prematurity was associated with the occurrence of asthma in later life, but a weaker relationship was found when the birth weight was adjusted to the gestational age (13). In the current study, we did not obtain the gestational period at the time of birth. Therefore, it is not possible to comment on whether the observed difference of LBW in the two groups was due to prematurity, and we believe this is a limitation of the study.

In the current study, 66.3% of the children with asthma had some form of nutritional abnormality. Conversely, in a study done in Serbia in 2013, Scepanovic et al. revealed that under-nutrition or over-nutrition exists in 34.5% of children with asthma (4). In the present study, the most prevalent nutritional abnormality was thinness or severe thinness (an overall proportion of 45.3%). However, the proportions did not show a statistically significant difference between children with and without asthma. Moreover, in this study, 38.4% of the healthy children had either thinness or severe thinness. Similarly, a study done in 2016 by the Medical Research Institute, Sri Lanka, in collaboration with United Nations International Children's Emergency Fund (UNICEF) and World Food Programme, revealed a 30.2% prevalence of thinness community. In the same study, the prevalence of thinness in the southern province was 34.8% (14), indicating that the nutritional status of the comparison group was fairly representative of the general paediatric population.

Overweight and obesity were common findings among children with asthma. This finding is compatible with most of the research conducted in other settings such as Poland and the United States (15,16,17). In the present study, 14.0% of children with asthma were either overweight or obese. In a study done in Poland by Umławska W in 2014, 18.7% of children with asthma had BMI above the cut off level for overweight (16). Among healthy children,

4.6% were either overweight or obese. Similarly, the prevalence of overweight or obesity was 6.0% in a large scale study in Southern province in Sri Lanka in 2016 (14). It is possible that the increasing trend of childhood overweight and obesity is reflected by the higher prevalence of the same observed in this study.

Obesity is a recognised complication of long term systemic steroid therapy (5). However, in this study, the duration and the dose of inhaled steroids did not show significant associations with the presence of obesity in children with asthma. Some studies reveal that long-term inhaled steroid usage could affect the children's linear growth (5,18,19). In contrast, a recent study done in Sri Lanka by Anuradha et al. showed that inhaled corticosteroids (ICS) do not affect the growth and bone profile; however, the long-term ICS usage can result in adrenal suppression (20). There was no significant difference in the prevalence of stunting among children with asthma compared to healthy children in our study. Further, the duration and the dose of ICS showed no relationship with the stunting within the asthma group.

Some form of food restrictions was seen among 72.0% of children with asthma. Similarly, a study done by Ang KL et al. in Singapore revealed that 60% of children with asthma were on some form of dietary restrictions (3). Parents tend to restrict refrigerated food, eggs and dairy products. However, there was no statistically significant association between nutritional abnormalities and dietary restrictions in the asthma group. There could be a high prevalence of micronutrients deficiencies, especially vitamin D levels among children with asthma.

This study is a maiden attempt to identify the relationship between nutritional abnormalities among children with asthma in relation to healthy children of the same age and sex, particularly in reference to their restrictive dietary practices. However, in the present study, we have not considered other confounding factors for overweight and obesity, such as physical activity, screen time and monthly income of the two groups, which can be considered as a limitation. Also, we did not address micronutrient abnormalities, which could be a potential nutritional risk considering the restriction of food such as eggs and dairy products.

The small sample size could have been another limitation leading to the failure in detecting

associations with nutritional abnormalities within the asthma group. Furthermore, the disease group consisted of children attending one tertiary care centre in Sri Lanka. Therefore, there will be limitations when it is extrapolated into the population.

Conclusions and recommendations

Nutritional abnormalities are common among children with asthma even though this study showed no significant difference of overweight, obesity, thinness or severe thinness between children with asthma compared to healthy children. The duration of the ICS therapy and the steroid dose showed no relationship with nutritional abnormalities among children with asthma. Though dietary restrictions were significantly more common in children with asthma, there was no association found between dietary restrictions and nutritional abnormalities within this group.

The authors would like to recommend conducting further studies in different setups to assess nutritional status among children with chronic asthma in larger samples to elicit significant associations. Furthermore, it is essential to look into micronutrient deficiencies among children with asthma.

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Associated factors, outcomes and prevention of birth defects among infants in Southern Sri Lanka

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Abstract

Background and objectives

Birth defects among children is a significant public health problem because of the higher morbidity and mortality associated with it. This study was carried out to assess the awareness of the mothers on birth defects, to identify the associated factors of structural birth defects (SBD), to detect the outcomes of the SBD among infants and to assess the effectiveness of the newly designed health education materials in increasing knowledge on birth defects among public health midwives (PHMs) and mothers.

Materials and methods

This study was carried out under four phases. A cross-sectional study to assess the knowledge and awareness of the mothers regarding birth defects. A case-control study to identify the factors associated with SBD, a follow-up study to identify the outcomes of SBD and an interventional study to assess the effectiveness of health education materials developed.

Results

The overall knowledge on birth defects in antenatal mothers was moderate (56.4%). The knowledge was positively associated with educational ($p<0.001$) and socio-economic status of the mother ($p<0.05$) and number of antenatal clinic visits made by the mother ($p<0.001$).

Low birth weight, family history of birth defects, gestational diabetes mellitus and antenatal pyrexia have an increased risk for SBD. Higher educational ($p<0.001$) and higher socio-economic status of the mother ($p<0.001$), receipt of pre-conceptional care ($p<0.001$) and regular micronutrient intake during pregnancy ($p<0.001$) were associated with a reduced risk of SBD.

About 14% of the children with birth defects in the

sample died eventually. A considerable proportion of survivors had growth impairment (28%) and developmental delay (25%). Among the survivors, about 28%, 15% and 57% of the SBD were completely corrected, partially corrected and uncorrected by the age of one year respectively.

Health education materials developed for this study were effective in increasing birth defects knowledge among eligible females ($p<0.001$) and PHMs ($p<0.001$).

Discussion and Conclusions

The knowledge on birth defects among the eligible females is inadequate. The rate of cure of the SBD during infancy is suboptimal. Mortality among infants with SBD is high. Health education materials developed by the principal investigator were effective in increasing knowledge on birth defects among mothers and PHMs. Preconceptional care coverage and community awareness on birth defects should be increased to prevent birth defects in the target population. Health care services should be expanded to provide optimal and timely management to the affected infants.

Key words - Associated factors, Galle, Sri Lanka, prevention, structural birth defects

Introduction

Birth defects, also known as congenital anomalies or congenital malformations, are defined as “structural or functional abnormalities, including metabolic disorders, which are present from birth” (1). They are a diverse group of complex disorders of prenatal origin. As a whole, these defects are identified as a serious public health problem, which contributes significantly to childhood morbidity and mortality (2,3).

It is found that the prevalence of birth defects is rising or remains static in the developed as well as in the developing world (2,4). It is estimated that about eight

million children, which is six percent of the total births in the world are born with a serious birth defect of genetic or partially genetic origin in every year. It is found that additional hundreds of thousands of more children are born with serious birth defects of post-conception origin, including maternal exposure to environmental agents or the teratogens (2). The prevalence of birth defects in Sri Lanka is found to be 4.3% (5).

Some birth defects are lethal while some birth defects cause lifelong disability. The survivors of birth defects are made to suffer from lifelong mental, physical, auditory or visual disability, which adversely affect individuals, families, health-care systems and societies. According to the March of Dimes Global Report on Birth Defects, at least 3.3 million children under five years of age die due to birth defects (2), while the WHO (2016) has reported 303,000 neonatal deaths every year due to birth defects worldwide (4). Another 3.2 million among the survivors of birth defects are found to be disabled for life (2). Apart from the morbidity and mortality caused among live births, birth defects are known as a significant contributor for spontaneous abortions and still births (3).

With this background this research was planned to describe the associated factors and outcomes of structural birth defects (SBD) among infants in Southern Sri Lanka and to develop and evaluate a prevention programme for birth defects.

Materials and Methods

This study was carried out under four phases. In phase I, a cross-sectional study was carried out to identify the knowledge on birth defects among the antenatal mothers in Galle. Three hundred and fifty antenatal mothers (n=350) attending the antenatal clinics in Bope-Poddala health unit area were recruited and data were collected using a self-administered questionnaire. The total scores of knowledge on birth defects were calculated and converted into percentages. Linear regression was used to identify the factors associated with knowledge on birth defects.

In the second phase a case-control study was carried out to identify the risk and protective factors of SBD among infants. A sample of 315 infants with SBD (cases) and 630 infants without SBD or any chronic disease condition (controls) aged up to six months, residing in Galle district were recruited. An interviewer administered questionnaire was used to

collect data and univariate and multivariate regression analysis were performed to identify the associations between independent and dependent variables.

A prospective follow-up of the infants with SBD (n=312) was carried out in the third phase to identify the outcomes of SBD at one year of age. An interviewer administered questionnaire was used to collect data, and information on SBD were extracted from the medical records of the infants. Descriptive statistics were used to present the results.

Finally, a health education leaflet and a health education handbook on birth defects and prevention strategies were developed for eligible females and for PHMs respectively. Then the effectiveness of these health education materials was tested. The effectiveness of the health education leaflet was assessed recruiting 139 antenatal mothers selected conveniently from Bope-Poddala (intervention group, n=70) and Matara Municipal Council (control group, n=69) Health Unit areas. The effectiveness of the health education handbook was assessed recruiting the PHMs attached to Bope-Poddala (intervention group, n=16) and Matara Municipal Council (control group, n=17) Health Unit areas. A self-administered questionnaire was used to assess the knowledge on birth defects in pre and post assessments of intervention. Paired *t* test was used to assess the mean differences in knowledge after the normality assessments of the data.

Data were analyzed using SPSS version 20. The level of significance was considered as $p < 0.05$. Ethical approval to conduct the study was obtained from the Ethical Review Committee of the Faculty of Medicine, Galle (Reference No: 17/11/14.3.4).

Results

Phase I

Characteristics of the participants

A sample of 350 antenatal mothers residing in the selected Health Unit was included in the analysis. The majority 313 (89.4%) of the participants were Sinhalese while 35 (10%) were Muslims and 2 (0.6%) were Tamils. The mean age of the participants was 29 years (SD = 5 years) and the age range was 17 to 44 years. The majority (n=275, 78.6%) have passed or

studied above the GCE O/L exam and 51 (14.6%) out of them have had higher education. Eighty-two participants (23.4%) were employed. The monthly income of the majority of the participants (n=166, 47.4%) was between 25000-49000 Sri Lankan Rupees (SLR). Hundred and fifty-four (n=154, 44%) were primiparous mothers. Among the multiparous mothers (n=196), 14 (7.1%) had a child with birth defects.

The knowledge on birth defects and the correlates of knowledge on birth defects

The average scores of knowledge on birth defects, associated factors and prevention and management were 57.6% (95% CI= 52.3%-62.9%), 55.1% (95% CI= 49.8%-60.4%) and 58.8% (95% CI= 53.5%-64.1%) respectively. The average score on overall knowledge was 56.4% (95% CI= 51.1%-61.7%).

Linear regression analysis results on the effect of socio-demographic characteristics on overall knowledge on birth defects are shown in the Table 1. Mothers with higher educational attainment ($p<0.001$), higher monthly income ($p<0.05$) and higher number of antenatal clinic visits ($p<0.001$) were found to have a higher overall knowledge. Age ($p=0.480$) and parity ($p=0.348$) of the mother and having children with birth defects ($p=0.878$) were not associated with the overall knowledge on birth defects.

Phase II

Characteristics of the sample

The sample consisted of 315 cases and 630 controls. There were 56.8% and 56.3% male infants respectively among the cases and the controls. The mean age of the cases was 43 days and the mean age of the controls was 31 days. The age range of infants of both case and control groups were 01 to 180 days. The infants were classified as cases and controls based on the presence or absence of SBD respectively.

Bivariate analysis was carried out to find out the socio-demographic, maternal and familial factors associated with the SBD among infants. Then multivariate regression analysis was carried out to find out the independent predictors of birth defects.

Factors associated with SBD

Low birth weight ($p<0.05$), family history of birth defects ($p=0.001$), gestational diabetes mellitus ($p<0.05$) and antenatal pyrexia ($p<0.05$) have an increased risk for SBD. Higher educational ($p<0.001$) and higher socio-economic status of the mother ($p<0.001$), receipt of pre-conceptional care ($p<0.001$) and regular micronutrient intake during pregnancy ($p<0.001$) are associated with a reduced risk of SBD. The table 2 shows the factors associated with SBD among infants according to the multivariate regression analysis.

Table 1: Effect of socio-demographic characteristics on overall knowledge on birth defects

Variable	B	SE	t	p
Constant	0.125	0.128	0.973	0.331
Maternal age	0.002	0.002	0.882	0.378
Educational level of the mother	0.118	0.019	6.194	0.000
Monthly income	0.003	0.000	2.455	0.015
Parity	0.018	0.014	1.286	0.199
Having children with birth defects	0.010	0.054	0.184	0.854
Total number of clinic visits attended	0.009	0.002	3.953	0.000

Table 2: Multivariate analysis results on the factors associated with Structural Birth Defects

Factor	OR	95% CI	p
Infant factors			
Low birth weight	3.0	2.2 – 4.1	0.004
Prematurity	1.2	0.7 – 2.3	0.529
Socio-demographic factors			
Maternal age ≤ 19 years	0.6	0.2 – 1.8	0.374
Maternal age ≥ 35 years	1.1	0.6 – 2.0	0.671
Father age ≥ 35 years	1.1	0.7 – 1.7	0.692
Low maternal education	4.0	2.7 – 5.9	0.000
Low socio-economic status	8.9	4.4 – 17.8	0.000
Genetic/ familial factors			
Consanguinity among parents	0.8	0.3 – 2.4	0.667
Other children with birth defects	18.5	3.6 – 96.2	0.001
Maternal obstetric factors			
Primiparity	1.3	0.8 – 2.0	0.275
Previous abortions	1.1	0.6 – 1.8	0.868
Previous stillbirths	0.9	0.1 – 6.3	0.944
Maternal health			
BMI < 18.5 (kg/m ²)	0.9	0.5 – 1.4	0.574
BMI ≥ 25.0 (kg/m ²)	1.0	0.6 – 1.5	1.000
Antenatal comorbidities			
Diabetes mellitus	2.8	1.2 – 6.7	0.017
Hypertension	0.7	0.3 – 2.2	0.367
Anaemia	0.9	0.6 – 1.4	0.712
Fever	4.1	1.4 – 12.3	0.012
Long term medication	1.2	0.5 – 2.6	0.676
Health behaviour of the mother			
Receipt of preconception care	0.4	0.2 – 0.7	0.000
Preconception folic acid intake	1.1	0.7 – 1.7	0.768
Regular micronutrient intake	0.1	0.1 – 0.3	0.000
Regular clinic attendance	0.6	0.2 – 1.6	0.317

Phase III*Characteristics of the sample*

There were 315 infants with SBD in the study sample and 179 (56.8%) were males and 135 (42.9%) were females. One infant had ambiguous genitalia. Fifty-six (17.8%) infants were preterm. A total number of 620 SBD were recorded among the infants. One hundred and forty-one SBD (22.7%) were found among the infants who died and six (1%) SBD were lost to follow-up.

The prevalence of structural birth defects

The majority of the SBD were cardiovascular system (CVS) defects (n=398, 64.2%) followed by musculoskeletal (n=56, 9.0%) and the central nervous system (CNS) defects (n=52, 8.4%). Table 3 shows the number of defects in each system classified according to the Royal College of Pediatrics and Child Health adaptation of International Classification of Disease 10th version (ICD 10-RCPCH). The more common SBD among the infants are shown in the Table 4.

Table 3: The Structural Birth Defects present in the systems (n=620)

ICD10-RCPCH* code	Involved system/ organs	n	%
Q00-Q07	Nervous system	52	8.4
Q10-Q18	Eye, ear, face and neck	3	0.5
Q20-Q28	Circulatory system	398	64.2
Q30-Q34	Respiratory system	9	1.4
Q35-Q37	Cleft lip and palate	36	5.8
Q38-Q45	Digestive system	30	4.8
Q50-Q56	Genital organs	11	1.8
Q60-Q64	Urinary system	22	3.9
Q65-Q79	Musculoskeletal system	56	9.0
Q80-Q89	Other	3	0.5

*Royal College of Pediatrics and Child Health adaptation of International Classification of Disease 10th version

Table 4: The more common SBD among infants

ICD10-RCPCH code	Involved system/organs	Defects	n	%
Q20-Q28	Cardiovascular system	Ostium secundum atrial septal defect	219	35.3
		Patent ductus arteriosus	79	12.7
		Ventricular septal defect	48	7.7
Q65-Q79	Musculoskeletal	Congenital talipes	23	3.7
Q35-Q37	Clefts	Cleft lip and palate	21	3.4
		Cleft palate	15	2.4
Q00-Q07	Central nervous system	Congenital hydrocephalus	18	2.9
		Neural tube defects	15	2.4
Q38-Q45	Digestive system	Imperforate anus	11	1.8
		Intestinal stenosis	10	1.6

The outcomes of the SBD among infants

Three hundred and twelve (312) infants having 614 defects were included in the follow-up study.

About 14% (n=44) of the children with SBD died eventually. A considerable proportion of survivors had growth impairment (28%) and developmental delay (25%). The risk of mortality was higher in infants with cardiovascular, nervous and muscular defects. Among the survivors, about 28%, 15% and 57% of the SBD were completely corrected, partially corrected and uncorrected by the age of one year respectively. Spontaneous correction was accounted for 60% of the corrected defects.

Phase IV*Evaluation of the effectiveness of the leaflet*

In the intervention group 70 pregnant mothers from Bope-Poddala MOH area participated in the pre-evaluation and 64 (91.4%) mothers completed the post evaluation. Posttest response rate was 91.4%. In the control group responses were obtained from 69 mothers from Matara municipal council MOH area in the pretest. Sixty-one (88.4%) mothers among them

completed the post evaluation. Posttest response rate of the mothers of control sample was 88.4%.

Majority of the mothers in both intervention (n=65, 60%) and control (n=67, 97.1%) groups were Sinhalese. Majority of the mothers were within the age range of 25-34 years (n= 42, 60% in intervention and n=54, 78.2% in control groups).

The mean percentage scores of knowledge on birth defects, associated factors and prevention and management among the participants of the intervention group were 68.1%, 59.2% and 64.9% before the intervention and 81.7%, 75.5% and 79.9% respectively after the intervention. In the control group the mean percentage scores of knowledge on birth defects, associated factors, and prevention and management were 68.6%, 59.1% and 66.2% respectively in the pre intervention and they were 67.4%, 62.1% and 67.7% respectively in the post intervention.

Before the intervention, there was no significant difference found in any of the knowledge component among the participants of the intervention and control

Table 5: The effect of health education leaflet on mean percentage scores of knowledge among the mothers of the intervention and the control groups

Knowledge component	Pre intervention		p	Post intervention		P
	x ₁ (int)	x ₁ (cont)		x ₂ (int)	x ₂ (cont)	
	n=70	n=69		n=64	n=61	
Birth defects	68.1	68.6	0.908	81.7	67.4	0.000
Associated factors	59.2	59.1	0.974	75.5	62.1	0.000
Prevention/management	64.9	66.2	0.742	79.9	67.7	0.001

x₁ (int) – mean percentage score of knowledge before the intervention among the mothers of the intervention group

x₁ (cont) – mean percentage score of knowledge before the intervention among the mothers of the control group

x₂ (int) – mean percentage score of knowledge after the intervention among the mothers of the intervention group

x₂ (cont) – mean percentage score of knowledge after the intervention among the mothers of the control group

groups ($p < 0.05$). After the intervention, the intervention group showed a significant increase in all the components of knowledge ($p \leq 0.001$) compared to the control group (Table 5).

Evaluation of the effectiveness of the handbook

Sixteen PHMs (94%) from Bope-Poddala MOH area participated in the pre-evaluation, as the intervention group. All of them (100%) completed the post-evaluation after providing them with the handbook. Response rate was 100%. For the control sample 17 PHMs (85%) from Matara municipal council area participated in the pre-evaluation and 15 (88.2%) of them completed the post-evaluation. Response rate at the post evaluation was 88.2%.

The mean percentage scores of knowledge on birth defects, knowledge on associated factors and knowledge on prevention and management were 66.9%, 69.9% and 81.9% respectively, in the pre evaluation among the intervention sample. After the

intervention with the handbook the mean percentage scores on knowledge on birth defects, associated factors and prevention and management were 88.8%, 88.7% and 91.9% respectively.

In the evaluation among the control sample the mean percentage scores on knowledge on birth defects, associated factors and prevention and management were 80.0%, 69.2% and 76.5% respectively in pre intervention and in post intervention they were 70.7%, 70.2% and 82.0% respectively.

Before the intervention, the intervention and the control group did not show significant differences in knowledge on associated factors and the knowledge on prevention and management. The knowledge on birth defects was found to be higher among the control group before intervention. However, after the intervention, the intervention group reported a significant increase ($p < 0.05$) in all the components of knowledge compared to the control sample (Table 6).

Table 6: The effect of health education leaflet on mean percentage scores of knowledge among the public health midwives of the intervention and the control groups

Knowledge component	Pre intervention		p	Post intervention		p
	x ₁ (int)	x ₁ (cont)		x ₂ (int)	x ₂ (cont)	
	n=16	n=17		n=16	n=15	
Birth defects	66.9	80.0	0.006	88.8	70.7	0.001
Associated factors	69.9	69.2	0.888	88.7	70.2	0.001
Prevention/management	81.9	76.5	0.400	91.9	82.0	0.031

x₁ (int) – mean percentage score of knowledge before the intervention among the PHMs of the intervention group

x₁ (cont) – mean percentage score of knowledge before the intervention among the PHMs of the control group

x₂ (int) – mean percentage score of knowledge after the intervention among the PHMs of the intervention group

x₂ (cont) – mean percentage score of knowledge after the intervention among the PHMs of the control group

Discussion

The knowledge on birth defects among the eligible females in Galle, Sri Lanka is inadequate. Low birth weight, family history on birth defects, gestational diabetes mellitus are the risk factors for SBD while better educational and socio-economic status of the mother and receipt of preconception care are protective factors for SBD. The rate of cure of SBD during infancy is suboptimal and mortality among infants with SBD is high. Health education materials developed by the principal investigator were effective in increasing birth defects knowledge in mothers and PHMs.

The knowledge on birth defects

The categorical knowledge on birth defects, associated factors and prevention and management of birth defects and the overall knowledge on birth

defects were found to be moderate among the antenatal mothers in Galle district.

Better knowledge on birth defects among the antenatal mothers with higher educational attainment was demonstrated by several studies (6-9) which is similar to the present study. A better health seeking behaviour before and during pregnancy through various sources like consultants, medical officers, printed and electronic media and internet by the mothers with a higher educational attainment and higher socio-economic status would be a possible explanation.

In the present study the mothers who had made more visits to the antenatal clinics or to the health care workers had a higher overall knowledge on birth defects in contrast to the findings of some other studies. (9,10). The well-established maternal care services delivered through the hospital and field-

based set-ups in Sri Lanka might be a reason behind this improved knowledge noted among the clinic attendees.

We demonstrated the effectiveness of health education on birth defects carried out through printed health education materials; a health education leaflet and a health education handbook. Consistent with the results of the present study, an intervention study conducted in India, has shown the effectiveness of a health education handbook in increasing birth defects knowledge among health care workers at a rural setting (11).

The factors associated with SBD

The results of the present study indicated that, low birth weight of the infants, family history of birth defects, gestational diabetes mellitus (GDM) and antenatal pyrexia are associated with an increased risk for SBD among infants in Galle district.

Association of LBW with birth defects has been shown by several studies carried out in other countries (12-15). In the present study the prevalence of LBW among the infants with SBD was found to be two times higher compared to the LBW of Sri Lanka (16) and three times higher compared to that of Galle district (17). The higher prevalence of SBD among infants with LBW, indicates the excess morbidity caused by SBD among infants with LBW. The results stress the need to take measures to reduce the LBW rate in Sri Lanka.

The present study showed that positive family history of birth defects is associated with an increased risk of birth defects among infants in Galle district similar to several other studies carried out in various communities and various countries (8, 18-21).

Pre-existing and gestational diabetes mellitus (GDM) are well known risk factors for birth defects among children (2, 19-23) and GDM was found to be a risk factor for SBD in present study as well. Corea (1982) has found diabetes as a risk factor for birth defects among children in Sri Lanka (24). This was an island wide study carried out about 45 years back. The prevalence of GDM among the mothers of infants with SBD was found to be four times higher than the reported prevalence of GDM in Galle district (17).

The findings of the present study stress the urgent need to carry out measures to reduce the incidence of diabetes among females in child bearing age in Sri Lanka.

Association of the higher maternal educational status in reducing the incidence of SBD was shown by several other studies (13,20,22,25,26). Also, the higher socio-economic status of the family, has been identified as a protective factor against birth defects by many other studies (20,27,28). The reduction of SBD among the infants of mothers with higher educational and higher socio-economic status could be due to the better knowledge on birth defects and their prevention, good health behaviours in seeking and practicing health care and better access to nutrition and healthcare services compared to the mothers with low educational and low socio-economic status.

In our study, mothers who received preconceptional care reported a low prevalence of SBD among infants compared to the mothers who did not receive preconceptional care. A meta-analysis carried out by Wahabi and colleagues (2010) has found the effectiveness of preconceptional care in reducing diabetes related birth defects (29). Therefore, Sri Lanka should take measures to increase its periconceptional care coverage which is reported to be around 50% among newly married couples (16).

The present study has found that the regular intake of micronutrients during pregnancy is protective against SBD among infants. Raza and colleagues (2012) found about the abstention of micronutrients during pregnancy and the incidence of birth defects. A hospital based; case-control study conducted in Iran found poor nutritional status of the mother as a risk factor for the occurrence of NTD (30). Nutrition is one of the key important factors that needs to be dealt with each and every pregnancy. Therefore, the eligible females in Sri Lanka must be educated thoroughly on proper nutrition with regard to both macro and micro nutrients before and during pregnancy when targeting a reduction of birth defects in the country.

There were few limitations to the study. Since, this study was confined to Galle district, the results may

not be generalized to the other areas. In the case-control study only live births were recruited and this might have led to under representation of lethal SBD which resulted in fetal deaths. Since, this study excluded the SBD of known genetic origin, the study derives associations on isolated or multiple non-genetic or non-syndromic SBD only.

Health education on birth defects, on risk and protective factors of birth defects and on prevention of birth defects needs to be carried out for eligible females of Sri Lanka as a preventive measure of birth defects. The health education leaflet and the health education handbook, developed in the present study can be distributed among the eligible females and the PHMs of Sri Lanka to increase the knowledge on birth defects.

The preconceptional care coverage should be increased in Sri Lanka and special attention should be paid to the females in low resource settings. Birth defects prevention programmes should reach the mothers with low education and low socio-economic status. Measures to reduce low birth weight in Sri Lanka should be strengthened further. The nutrition of the prepregnant and pregnant females should be optimized. The antenatal mothers with comorbidities should be paid special attention. Effective measures to reduce the incidence of preexisting and gestational diabetes mellitus in Sri Lanka need be carried out by the health care workers. Blood sugar levels of the antenatal mothers should be closely monitored and controlled. The antenatal mothers with positive family history of birth defects and the mothers with known risk factors of birth defects should be screened for possible birth defects of the fetus.

The infants with birth defects should be diagnosed early and they should be provided with the effective management modalities without delay. The health care delivery system of Sri Lanka should allocate more infrastructure facilities and manpower, to screen, to diagnose and to manage the birth defects effectively.

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Trans-thoracic echocardiography in patients with acute ischaemic strokes and normal clinical cardiac assessment

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ABSTRACT

Introduction: Stroke is one of the leading causes of disability and mortality in Sri Lanka. Cardiac sources of embolism account for 15 – 30% of ischaemic strokes and for the optimal treatment aiming at secondary prevention it is crucial to identify the source of the embolism. We aimed to assess the influence of routine echocardiography in the management of patients with ischaemic strokes who had no evidence of cardiac abnormality on routine medical history, physical examination and 12-lead ECG.

Method: Trans-thoracic echocardiography (TTE) was performed in consecutive patients admitted to University Medical Unit, Teaching Hospital Karapitiya with an acute ischaemic stroke and normal clinical cardiac evaluation including 12-lead ECG. The echocardiogram findings were categorized as therapeutically significant or insignificant based on the 2013 American Heart Association/ American Stroke Association guidelines for the prevention of strokes in patients with strokes and transient ischaemic attack, by the cardiologist who performed the echo and the treating physician.

Results: Of the 110 patients with acute ischaemic stroke and normal clinical cardiac evaluation, 14.5% had therapeutically significant echo findings; left ventricular systolic dysfunction with ejection fraction <35% in 13 (11.8%), left ventricular aneurysm with intraventricular clot in 2 (1.8%), and tight mitral stenosis in 1 (0.9%).

Conclusion: In this study, TTE revealed cardiac abnormalities that needed specific treatment in 16 (14.5%) patients with acute ischaemic stroke and normal clinical cardiac evaluation. TTE should be considered an essential test in the evaluation of all ischemic stroke patients regardless of findings in the clinical evaluation of heart.

Key words: Acute ischaemic stroke, clinical evaluation, electrocardiography, echocardiography,

Introduction

Stroke is one of the leading causes of disability and mortality worldwide. Ischaemic stroke accounts for about 70 – 80% of all strokes and is caused by embolic or thrombotic occlusions in the cerebral vessels (1). Large artery atherosclerosis is the commonest aetiology of ischaemic strokes while cardiac sources of embolism account for 15 – 30% of cases (1). The latter is associated with poor prognosis and fatal recurrences. In order to establish an optimal preventive strategy, it is crucial to identify the source of the embolism.

To find the cardiac source of embolism a detailed medical history and physical examination are required. In addition, ECG and chest radiograph are routine investigations performed in order to find cardiac abnormalities which can be potential sources of embolisation. There is a considerable disagreement, however, among clinicians regarding the extent of cardiac testing that should be performed in patients with ischaemic stroke, especially in less resourceful settings (2).

The routine use of echocardiography in all patients with ischaemic strokes is debatable, particularly when the detailed history, physical examination and ECG fail to show any evidence of previous or ongoing cardiac pathology (2). Furthermore, routine echo may show the existence of cardiac abnormalities which are unlikely to be the cause of ischaemic stroke, hence have no therapeutic implications. They include degenerative changes in the cardiac valves especially mitral and aortic valves.

A recent hospital-based study from Canada involving patients with ischaemic strokes reports that TTE has a low yield, diagnosing only 4% of significant cardiac abnormalities (2). A similar single centre study from Pakistan revealed 15.5% patients to have TTE abnormalities suggestive of cardioembolic aetiology (3). We were unable to find previous studies with similar objectives done in Sri Lanka. Therefore, this study was planned to assess the usefulness of routine TTE in patients with ischaemic strokes who have no evidence of previous or ongoing cardiac abnormality on routine medical history, physical examination or 12-lead ECG.

Method

This study was carried out in the University Medical Unit of Teaching Hospital Karapitiya which is the largest hospital in the Southern Province with the highest patient turnover. Consecutive patients with acute ischaemic strokes admitted to the above unit via outpatient department were included in the study.

All patients admitted with non-traumatic acute focal motor and or sensory neurological deficit who underwent urgent cranial CT imaging. All the CT images were examined by a qualified radiologist and a neurologist for the presence of cerebral bleeding or space occupying lesions that could explain the current clinical presentation. Those with normal CT images as well as those with CT evidence of recent cerebral ischaemia were considered to have cerebral infarctions and were eligible for this study. In these patients' other causes of acute focal neurological manifestations such as hypoglycaemia, alcohol intoxication and hemiplegic migraine were excluded. A senior registrar with postgraduate qualifications gathered clinical information using an interviewer-

administered questionnaire and at the end detailed clinical examination was done. Those who had atrial fibrillation, cardiac enlargement or valvular abnormalities detected during clinical assessment were excluded from the analysis. Patients with hypertension, diabetes or dyslipidaemia were not excluded from the analysis. For this analysis only, those patients who had normal clinical cardiac evaluation (history and examination) and 12 lead ECG were considered.

All 110 patients recruited for the study underwent echocardiogram by a qualified cardiologist and the findings were categorized as therapeutically significant (those needing therapeutic interventions) or therapeutically insignificant (age-related and those not needing further investigations or therapeutic interventions) based on the 2013 American Heart Association/ American Stroke Association guidelines for the prevention of strokes in patients with strokes and transient ischaemic attack (4). Categorization was done by the caring physician in consultation with the cardiologist who performed the TTE. The ethical clearance for the study was obtained from the Ethics Review Committee Faculty of Medicine, University of Ruhuna, Sri Lanka. Informed written consent was obtained from all the patients prior to the echocardiography.

Results

Of 110 subjects included in the study sample, 60 (54.5%) were males. Sixty-three (62.7%) had evidence of cerebral ischaemia in the initial CT while initial CT was normal in others. Fifty-three (52.7%) patients were within 50-70 years while 14 were below 50 years. Thirty-eight patients were older than 70 years. Past history of stroke or transient ischaemic attacks was observed in 8.2% and 7.3% of individuals, respectively. Hypertension was the most common risk factor identified in this study (Table1).

Table 1: Selected risk factors of stroke among study participants

Variable	Frequency (%)
Non-communicable diseases	
Hypertension	70 (63.6%)
Diabetes mellitus	29 (26.4%)
Dyslipidaemia	31 (28.2%)
Habits	
Current or past smoking	35 (31.8%)
Past history	
Stroke	09 (8.2%)
TIA	07 (7.3%)
Family History	
Ischemic heart disease	20 (18.2%)
Stroke	20 (18.2%)
BMI	
Low	01 (0.9%)
Normal	62 (56.4%)
Overweight and obese	47 (42.7%)

Table 2: Echo findings of study participants

Echo findings	Frequency (%)
Left ventricular ejection fraction < 35%	13 (11.8%)
Left ventricular aneurysm with a thrombus	02 (1.8%)
Tight calcific mitral stenosis	01 (0.9%)
Therapeutically insignificant or normal	94 (85.5%)

Therapeutically significant echo findings were detected in 16 (14.5%) study participants and the distribution is shown in Table 2.

Discussion

In this study, 14.5% of patients with acute ischemic stroke and normal clinical cardiac evaluation had therapeutically significant TTE findings varying from left ventricular systolic dysfunction to tight calcific mitral stenosis. This highlights the importance of including the TTE in the routine assessment of patients presenting with ischaemic strokes irrespective of their findings in the routine clinical cardiac assessment. All cardiac lesions detected required patients to be anticoagulated and the decision to add anticoagulants on these patients was taken after considering other factors such as the extent of the cerebral lesion and the risk of bleeding.

The association between heart disease and embolisation causing ischaemia in distant organs is well established. Nishide et al., (1981) in a case control study demonstrated that patients with ischaemic strokes have a higher prevalence of structural and functional cardiac abnormalities compared to controls (5). Certain degree of uncertainty prevails, however, whether routine echo is justifiable in ischaemic strokes when clinical evaluation fails to demonstrate a presence of a cardiac lesion. Lovett et al., (1981) found only 6.5% patients with ischaemic strokes to have intracardiac thrombi needing anticoagulation (6). Nearly 70% patients had no echo abnormalities while 23% showed cardiac abnormalities of doubtful significance. Supportive of this data, Greenland et al., (1981) found no cardiac abnormalities in routine echo assessment of 45 patients with ischaemic strokes but no heart disease detectable clinically or electrographically (7). In contrast, however, Todnem et al., (1981) detected 25 patients with significant cardiac lesions undetected by clinical evaluation when they performed routine echo for 194 patients admitted with ischaemic strokes (8).

The reasons for this disparity in echo findings may be due to several reasons. Patients with ischaemic strokes are likely to have incidental cardiac abnormalities with doubtful clinical importance (7). Congenital bicuspid aortic valves, degenerative changes involving valve rings and age-related calcification of valves cannot be directly attributed to the etiology of ischaemic strokes, hence may be ignored during echo

assessment. Furthermore, undetected cardiac abnormalities could be higher in areas with high prevalence of rheumatic heart disease (3). Although rheumatic fever is rare entity in Japan currently, Nishide et al., (1983) reported 32 out of 66 patients with ischaemic strokes and seven out of 21 controls to have echo findings compatible with rheumatic heart disease (5).

There was an 11.8% of patients with asymptomatic left ventricular systolic dysfunction with ejection fraction < 35% in our study. Literature review reveals that the prevalence of stage B heart failure (reduced left ventricular ejection fraction without symptoms of heart failure) varied between 12.9% and 21.4% in the community and also increased with age (9-12). Diabetes and hypertension are the most important underlying causes of heart failure and these two diseases were prevalent among our study participants. Tight calcific mitral stenosis is usually clinically inaudible and small left ventricular aneurysm with an apical thrombus also cannot be detected on clinical evaluation.

Place of routine TTE in the evaluation of patients with stroke and low risk of embolic aetiology is uncertain. However, in this study TTE influenced the therapeutic management of 14.5% of patients with acute ischaemic stroke with normal clinical cardiac evaluation. This study has several limitations. They include small sample size, variable duration of stroke at the time of performing the CT scan, and single center design. However, with those limitations the findings enable commencement of anticoagulation to prevent further stroke in one out of seven patients with normal cardiac examination. Hence these findings are clinically relevant in prevention of stroke especially in resource poor setting.

Therefore, we suggest that TTE should be mandatory in routine investigation in the evaluation of all acute ischemic stroke patients regardless of the clinical findings.

Acknowledgment

Dr PP Sathananthan, Consultant Cardiologist, Teaching Hospital, Karapitiya, for his contribution to carryout echocardiography for the patients included in the study.

Limitations

This study has several limitations. They include small sample size, variable duration of stroke at the time of performing the CT scan, and single center design. Similar research involving more patients across multiple centers would provide more information.

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Ongoing postgraduate research projects & thesis submitted during 2021 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. Antimicrobial properties of five medicinal plants found in Sri Lanka: Possible application as effective disinfectants to nosocomial infections

Candidate – WSG De Soyza , Department of Biochemistry, Faculty of Medicine University of Ruhuna

Principal Supervisor – Dr. MT Napagoda, Department of Biochemistry, Faculty of Medicine, University of Ruhuna

Co-Supervisors

Prof. WMDGB Wijeyaratne, Faculty of Microbiology, Faculty of Medicine, University of Ruhuna

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

Funding – NSF Grant No RG/2015/BS/01

02. 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 – Dr. 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

03. Effects of educational intervention on knowledge and compliance of warfarin among the patients with long term warfarin therapy who are followed up at Teaching Hospital, Karapitiya

Candidate – AKT Ishara Wanniarachchi, Department of Pharmacology, Faculty of Medicine, University of Ruhuna

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

Co-Supervisor – Prof. PLGC Liyanage, Department of Pharmacology, Faculty of Medicine, University of Ruhuna

Funding – Faculty Research Grant

04. 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 of Ruhuna

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

05. 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)

MPhil thesis submitted during 2021

01. Age related trends and population specific reference ranges of bone mineral density and biomarkers of bone turnover in adult females

Candidate – MRP Hasanga, Department of Biochemistry, Faculty of Medicine, University of Ruhuna

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

Co-Supervisors

Prof. CM Wickramathilake, Department of Biochemistry, Faculty of Medicine, University of Ruhuna

Prof. RSJ Lenora, Department of Physiology, Faculty of Medicine, University of Ruhuna

Funding – UGC Block Grant No RU/PG-R/16/02

Date of Submission- March 2021

02. Effect of core stability training of physical performance and knee jerk reflex in army male rugby players in Sri Lanka

Candidate – SADCS Senavirathna, Department of Physiotherapy, Faculty of Allied Health Sciences, Sir John Kotelawala Defense University, Werahara

Principal Supervisor – Prof. S Gunawardena, Department of Physiology, Faculty of Medicine, University of Ruhuna

Co-Supervisors

Prof. AL Karunanayake, Department of Anatomy, Faculty of Medicine, University of Kelaniya

Mr. ASP Mallawaarachchi, Instructor Education, Department of Physical Education, University of Peradeniya

Funding – Self funded

Date of Submission- April 2021

PhD Degrees

PhD studies in progress

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 of Ruhuna, 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 of Ruhuna

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 – Dr. 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 Sir 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 – Dr. 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 of Ruhuna

Prof. MB Samarawickrama, Department of Anatomy, Faculty of Medicine, University of Ruhuna

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

Dr. AS Dissanayake, Department of Medicine, Faculty of Medicine, University of Ruhuna

Prof. MB Samarawickrama, Department of Anatomy, Faculty of Medicine, University of Ruhuna

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 – WASD Wickramasinghe, Department of Biochemistry, Faculty of Medicine, University of Ruhuna

Principal Supervisor – Dr. 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

PhD thesis submitted during 2021

01. Effects of metformin and lifestyle modifications on the progression of atherosclerosis among individuals with impaired glucose tolerance

Candidate – ATIM Amarasinghe, Department of Pharmacology, Faculty of Medicine, University of Ruhuna

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

Co-Supervisors

Prof. TP Weeraratna, Department of Medicine, Faculty of Medicine, University of Ruhuna

Dr. Manilka Sumanathilaka, Diabetes and Endocrinology Unit, Teaching Hospital, Karapitiya, Galle

Funding – UGC grant No- 2016-UGC/2015/RUH/01

Date of Submission- June 2021

02. Nephroprotective activity of a novel herbal nutraceutical mixture derived from selected medicinal plant extracts in rats with chemically induced nephrotoxicity

Candidate – AMSS Amarasiri, B.Sc. Medical Laboratory Science Degree Programme, Faculty of Medicine, University of Ruhuna

Principal Supervisor – Dr. AP Attanayake, Department of Biochemistry, Faculty of Medicine, University of Ruhuna

Co-Supervisors

Prof. KAPW Jayatilake, Department of Biochemistry, Faculty of Medicine, University of Ruhuna

Prof. LKB Mudduwa, Department of Pathology, Faculty of Medicine University of Ruhuna

Funding – UGC Block Grant No – RU/PG-R/16/14 & NSF Grant No – RG/2016/HS/03

Date of Submission- May 2021

03. Vasculopathy, systemic inflammation, body composition and cardiometabolic risk among patients with chronic kidney disease

Candidate – EH Silva, B.Sc. MLS Degree Programme, Faculty of Medicine, University of Ruhuna, Galle

Principal Supervisor – Prof. CM Wickramatilake, Department of Biochemistry, Faculty of Medicine University of Ruhuna

Co-Supervisors

Prof. S Lekamwasam, Department of Medicine, Faculty of Medicine, University of Ruhuna

Prof. LKB Mudduwa, Department of Pathology, Faculty of Medicine University of Ruhuna

Dr. RA Udayasiri, Consultant Vascular and Transplant Surgeon, Teaching Hospital, Karapitiya

Funding – UGS Block Grant No- RU/PG/16/06

Date of Submission- August 2021

04. Double blind placebo controlled randomized clinical trial of a herbal capsule of *Coccinia grandis* (L.) Voigt in newly diagnosed patients with type 2 diabetes mellitus and its' bioassay guided isolation of antidiabetic compounds

Candidate – KGP Wasana, Department of Biochemistry, Faculty of Medicine, University of Ruhuna,

Principal Supervisor – Dr. AP Attanayake, Department of Biochemistry, faculty of Medicine, University of Ruhuna

Co-Supervisors

Prof. TP Weeraratna, Department of Medicine, Faculty of Medicine, University of Ruhuna

Prof. KAPW Jayatilaka, Department of Biochemistry, Faculty of Medicine, University of Ruhuna

Dr. JMS Jayasinghe, Department of Chemistry, Faculty of Science, University of Peradeniya

Funding – NRC Research Grant (N0.17 -029)

Date of Submission- July 2021

Dean's Awards-2020

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 2020 were awarded the following students.

Dean's Award for the Best 2nd MBBS student of 2020.



Miss Charuni Wijesinghe completed her primary and secondary education at Mahamaya Girls' College Kandy. She entered The Faculty of Medicine University of Ruhuna in 2017. She passed her 2nd MBBS examination with First-class honours and Distinctions for all three subjects; Anatomy, Physiology and Biochemistry. She is a member of the Faculty dancing troupe and participated in many Interfaculty dancing competition, and placed 3rd in the free style event in 2018. She also participated in the Orator of the year competition in 2018. She is member of the Faculty women's basketball team and placed 2nd runner up in Inter-Medical Faculty Championship in 2019. She is a member of the Faculty swimming team and placed 2nd in the women's 100m breaststroke and 3rd in the 50m butterfly event in the Inter Faculty Swimming Meet in 2019. She has participated in a multitude of faculty level tournaments of badminton, athletics, swimming and basketball.

Dean's Award for the Best 3rd MBBS student in 2020



Mr. PN Sanjaya Lakmal Priyadarshana studied at the Rahula College, Matara and entered the Faculty of Medicine, University of Ruhuna in 2016. He passed the 2nd MBBS Examination with First-class honours with Distinctions in Anatomy and Physiology and won the Dean's Award for the Best 2nd MBBS student in 2018. He passed his 3rd MBBS examination with First Class honours with distinctions in Parasitology, Pathology and Pharmacology.

He is a member of the Eastern Dancing Troupe of the Faculty and was a member of teams placed runners-up and 2nd runners-up in Inter-faculty dancing and literature competitions in 2016 and 2018. Also, he has participated as a member of the dancing team in Sri Lanka University Games, Faculty of Medicine Academic Sessions and many other University and faculty functions. He was the captain of the Faculty chess team in 2016, 2017 and 2018, and placed the 2nd runners-up in Inter Faculty chess championships in 2017 and 2018. He was also the captain of the Faculty scrabble team in 2019, and has placed 2nd runners-up in Inter Medical Faculty scrabble championship in 2019. He was the President of Self Help Fund, Vice Secretary of the Horticulture society in 2018, and a volunteer member of the first aid committee in SLUG 2019. He presented his research in the 3rd National undergraduate research symposium, organized by the University of Ruhuna in 2018, and also presented another research in the FMAS 2020.

Dean's Award for the Best final MBBS student in 2020

Dr. JGGD Akalanka Jayasekara had his primary and secondary education from Theraputta National School Ambalanthota and was selected to the Faculty of Medicine University of Ruhuna in 2014. He passed the Second MBBS examination with a Second class Upper Division with Distinction in Anatomy and passed his Third MBBS examination with First class Honors with Distinctions in Pathology, Forensic Medicine, Microbiology and Parasitology. He obtained the Dean's award for the best third MBBS Student in 2018. He passed the final MBBS examination with Second class Upper Division with Distinctions in Surgery and Psychiatry. He was awarded the Caroline Mohotti Memorial Gold Medal for the best final MBBS Student with the highest total aggregate and the Vice Chancellor's Gold Medal for the most outstanding medical undergraduate in 2020.

He graced the University nationally and internationally. There he placed where he represented the University of Ruhuna in Japan East Asia network of an exchange student in Tokyo and Nagasaki in 2019. And he was placed among the top ten narrators in Sri Lanka in an interuniversity narrative competition organized by Sri Lanka Medical Association in 2019. He has authored and published several research works and presented in prestigious forums including GMA, FMAS and GELSA. He has immensely served during his tenure as Junior Treasurer and Editor in Medical Faculty Buddhist Association, and editor and convener in Art Circle. Also he was a member of the Medical Faculty Eastern Dancing troupe and became the runner up in Inter Faculty Dancing and Literature Competitions in 2014, 2015, and 2016 respectively.

FMAS Winners of Free paper Sessions 2020

Best Oral Presentation in Open Category

Effect of Parity and breast feeding duration on measures of sarcopenia in women aged 40-60 years: a community based cross-sectional study

Presented by: Rathnayake N

Authors: Rathnayake N, Alwis G, Lenora J, Lekamwasam S

Commended Oral Presentation in Open Category (2 places)

1. Study on “Non-Invasive Follicular Thyroid neoplasm with Papillary-like nuclear features (NIFTP)”, in a Sri Lankan cohort.

Presented By: Wijesiri TW

Authors: Wijesiri TW, Mudduwa LKB, Liyanage TG

2. Prediction of insulin resistance by simple clinical parameters in patients with newly diagnosed type 2 diabetes mellitus

Presented by : Wasana KGP

Authors: Wasana KGP, Attanayake AP, Weeratarhna TP, Jayatilaka KAPW

Best Oral Presentation in Students' Category

Prevalence of burnout syndrome and associated factors among undergraduates of Medicine and Allied Health Sciences of intake of 2015/2016 of University of Ruhuna

Presented by: Thathsara PHN

Authors: Thathsara PHN, Thilana WG, Udayanga AM, Udeshika KAG, Viduranga MAO, Vitharana SB, Wanasinghe WLMS, Darshana ILAN

Commended Oral Presentation in Students' Category

Correlates of breast feeding difficulties among mothers of children below six months in Galle municipal health unit area.

Presented by : Jayasinghe HC

Indeewari GKP, Iranga JW, Jayarathne KDKDR, Jayasinghe HC, Jayasinghe MNY, Jayasiri LNH, De Silva KKWCI

FMAS Winners of Poster Presentations 2020

Best Poster Presentation in Open Category

Association of bone turnover markers with body composition and serum high sensitivity C-reactive protein levels in adult women

Presented by : Rathnayake H

Rathnayake H, Lekamwasam S, Wickramatilake CM, Lenora J, De Zoysa E

Commended Poster Presentation in Open Category

Quantification of polyphenol and flavanoid content in aqueous leaves extract of Ivy gourd collected from different geographical locations in Sri Lanka

Presented By : De Silva WN

Authors: Shanmuganathan E, De Silva WN, Attanayake AP, Arawwawala LDAM

Best Poster presentations in Students' Category

Quality of life and associated factors among patients with type 2 diabetes mellitus attending diabetic clinic of Teaching Hospital, Karapitiya

Presented by: Gunaratna LVT

Authors: Fernando MCL, Fernando MLS, Gajanayake TR, Galappaththi HGKN, Gamage KMKM, Gunarathne SGMM, Gunaratna LVT, Gunathilaka PGKA, De Silva PV

Commended Poster presentations in Students' Category

Pattern of transfer of patients from General, Base, Divisional Hospitals to Teaching Hospital, Karapitiya and its association with their clinical outcomes

Presented by: Sumanathilaka TGHK

Authors: Sumanathilaka TGHK, Silva GS, Sudeshika WKH, Sulochana GAI, Sumanadasa UMM, Suriyaarachchi DMAHS, Tharindi MDN, Wijesinghe CJ

Haematological characteristics in patients with chronic kidney disease attending a tertiary care hospital in Sri Lanka

Riyas FR¹, Wickramaratne KAC², Bandaranayaka KO³, Chathuranga BAG⁴, Wijewickrama DC⁵, Wijesundara CR⁶

¹ Management and Science Institute, Sri Lanka, Management and Science University, Malaysia

² Department of Pathology, Faculty of Medicine, University of Ruhuna

³ Management and Science Institute, Sri Lanka

⁴ Department of Medical Laboratory Sciences, Faculty of Allied Health Sciences, University of Sri Jayewardenepura

⁵ Department of Physiology, Faculty of Medicine, University of Ruhuna

⁶ Ministry of Health, Colombo.

Abstract

Background: Complete blood count parameters and blood cell morphology show changes with progression of chronic kidney disease (CKD).

Materials and methods: Descriptive cross-sectional study was carried out to assess haematological characteristics in a cohort of patients with CKD. Disease related information were obtained using an interviewer administered questionnaire, complete blood count data were obtained from clinic records and blood cell morphology was assessed in blood smears.

Results: Of 116 patients, 68 (58.6%) were males and 48 (41.4%) were females. Mean age of males was 57.2±15.8 years and females of was 57.8±14.2 years. 69 and 47 patients were in CKD stages 1-3 and 4-5 respectively. Hypertension, dialysis and erythropoietin treatment showed statistically significant association with CKD stages ($p<0.05$). 78 (67.2%) patients were anaemic and majority ($n=40$, 51.3%) belonged to CKD stages 1-3. 55 (70.5%) had normochromic normocytic anaemia and 97 (83.6%) had mild anisopoikilocytosis. Hypersegmented neutrophils were observed in 78 (67.2%) patients. Percentage of hypersegmented neutrophils were higher in patients with CKD stages 1-3 ($n=50$, 72.5%) than 4-5 ($n=28$, 59.6%) and in patients with anaemia ($n=56$, 71.8%) than in patients without anaemia ($n=22$, 28.2%) ($p>0.05$). RBC, The Hb, PCV, WBC and platelet count of patients in CKD stages 4-5 were significantly lower than those of CKD stages 1-3 ($p<0.05$).

Conclusion Advanced CKD is associated with significantly low RBC, WBC and platelet counts and significantly high RDW CV%. These haematological parameters can be used as surrogate markers to predict progression of CKD. A substantial number of patients with CKD had hypersegmented neutrophils.

Key words: Anaemia, Anisopoikilocytosis, Chronic kidney disease, Complete blood count, Hypersegmented neutrophils

Introduction

Chronic kidney disease (CKD) is progressive deterioration of renal function and is an emerging healthcare problem in Sri Lanka (1-4). CKD is evenly distributed in all provinces in Sri Lanka, while CKD of unknown origin is restricted to two (North Central and North West Province) of the nine provinces with some spill over into two other provinces (Uva and Eastern Province) (5). Anemia is a well-known complication and is a major determinant of the quality

of life and morbidity of patients with CKD (6). Other than reduction of haemoglobin, changes of many other haematological parameters have been observed in these patients (7, 8).

Persistent, low-grade inflammation plays an important role in the aetiology of CKD (9). Patients on haemodialysis and non-responders to erythropoietin therapy have shown high neutrophil counts with increased inflammation (10, 11) highlighting the importance of white blood cell (WBC) indices as

surrogate markers of inflammation in CKD (12). Recent studies have shown associations between increased WBC counts and declining kidney function (7, 13). The ratio of neutrophil-to-lymphocyte count has been suggested as a novel measure of inflammation and has been shown to have a prognostic value in patients with CKD (12) (14, 15). Inflammatory diseases were found to be significantly associated with red cell distribution width (RDW) (16, 17). Patients with high RDW were shown to have a greater impairment of renal function (18) and high RDW in dialysis patients was found to be a strong predictor of death (19, 20). Platelet count, platelet distribution width and mean platelet volume were also found to be significantly high in CKD patients with proteinuria (21).

Thus, the assessment of alterations in complete blood count (CBC) parameters and blood cell morphology with stages of CKD would increase the understanding of their potential role in predicting progression of CKD. Hence, this study was conducted to assess the haematological characteristics in CKD patients and to ascertain their association with the stages of CKD.

Material and methods

This descriptive, cross-sectional study was carried out in 2018 in an institute specialized for nephrology dialysis & transplantation in Sri Lanka after receiving the approval from the ethical review committee of the Faculty of Medicine, University of Ruhuna {reference number 2018/P/072 (23.10.2018)}. The permission to carry out the study was obtained from the management of the institution where it was carried out.

According to the National Health and Nutrition Examination Survey (NHANES; 2007–2010), anemia was estimated to be present in 15.4% of people with any stage of CKD (22). For a p value of 15%, the sample size calculated was 196 therefore, the target was to include 200 patients to the study. Consecutive 200 patients with confirmed CKD over the age of 18 years attending outpatient clinics in one month period were recruited to the study. Informed, written consent was obtained from all the patients before collection of data. Those who were - mentally unfit, did not comply and consent and those who did not have clinic records were excluded from the study.

Demographic data and clinical information such as exact disease type (diagnosis), stage and associated

co-morbidities were obtained using an interviewer administered, pretested questionnaire and from the clinic records of patients. Complete blood count (CBC) results of patients were obtained from the laboratory records and following parameters were extracted; red blood cell count (RBC), haemoglobin (Hb), packed cell volume (PCV), mean corpuscular volume (MCV), mean corpuscular haemoglobin concentration (MCHC), red cell distribution width (RDW CV%), white blood cell (WBC) count and platelet count. The blood samples collected for routine CBC were used to prepare stained blood smears which were assessed using bright field microscope (Olympus CX 32) under high power (magnification 40X) as per the criteria of International Council for Standardization in Haematology in order to evaluate the morphology of blood cells (23).

According to glomerular filtration rate, CKD was categorised into stages 1 ($\text{GFR} > 90 \text{ mL/min/1.73 m}^2$), 2 ($\text{GFR} = 60\text{--}89 \text{ mL/min/1.73 m}^2$), 3 ($\text{GFR} = 30\text{--}59 \text{ mL/min/1.73 m}^2$), 4 ($\text{GFR} = 15\text{--}29 \text{ mL/min/1.73 m}^2$) and 5 ($\text{GFR} < 15 \text{ mL/min/1.73 m}^2$) (24). Anaemia was diagnosed in males when the Hb level was below 130 g/L and in females when it was below 120 g/L and was categorised into mild (Hb: 110–129 g/L for males and 110–119 g/L for females), moderate (Hb: 80–109 g/L for both) and severe (Hb: $< 80 \text{ g/L}$ in both) (25). Anaemia was classified morphologically as normochromic normocytic (MCHC 34, MCV 80–100fl), hypochromic microcytic (MCHC < 34 , MCV $< 80\text{fl}$) and macrocytic (MCHC 34, MCV $> 80\text{fl}$) as per the standard classification based on MCV and MCH (23). These findings were further verified in the blood smears. RDW measures the broadness of red cell size distribution and RDW CV% is calculated by dividing the standard deviation of the mean cell size by the mean cell volume (MCV) of red cells and is expressed as a percentage. The reference interval for RDW CV% in the laboratory where the study was carried out is 11.5–14.5.

Anisocytosis is the presence of red cells with various sizes and poikilocytosis is the presence of red cells with various shapes. Description of both together is anisopoikilocytosis. Size variation in red cells were classified as microcytes and macrocytes. Poikilocytes studied in this study were acanthocytes, echinocytes and pencil cells. According to ICSH recommendations, presence of any of these cell types $< 5\%$, between 5–20% and $> 20\%$ per high power field

were considered mild, moderate and marked respectively (23). Presence of hypersegmented neutrophils was confirmed when a single neutrophil had six or more lobules or when there were more than 5% of neutrophils with five lobes in a smear (26). During the analysis, data were grouped as anaemic, non-anaemic, CKD stages 1, 2, 3 and CKD stages 4, 5 to assess the associations with demographic characteristics and haematological findings. All the data were documented and analysed with IBM SPSS Statistics software package version 25. The Fisher exact probability test, Chi square test and Student t-test were applied in grouped analysis appropriately. A p value of <0.05 was considered as statistically significant.

Results

Of the 200 patients recruited, only 116 patients consented to participate in the study. Of them, 68 (58.6%) were males and 48 (41.4%) were females.

The mean age of males was 57.2 ± 15.8 years and females was 57.8 ± 14.2 years. Majority (n=106, 91.4%) were married. The education level was below post primary in 40 (24.0%). Of all the patients, 34 (29.3%) were employed (professional, skilled and semi-skilled), 62 (53.4%) were unemployed and 20 (17.2%) were retired. There were 69 patients in CKD stages 1-3 and 47 patients in CKD stages 4-5. The duration of CKD ranged from less than one year to over ten years. It was difficult to ascertain the duration of illness in 17 (14.6%) patients due to incompleteness of clinic records. Age, gender or the duration since diagnosis showed no significant association with the stages of CKD ($p > 0.05$) (Table 1). There were 28 (24.1%) patients undergoing regular dialysis. Of the total anaemic patients, 19 (24.4%) were on dialysis and 21 (44.7%) were in CKD stages 4-5. There was a statistically significant association between the state of dialysis and the stages of CKD ($p < 0.05$) (Table 1 and 4).

Table 1: Association of demographic characteristics with stages of chronic kidney disease among study population

Characteristic	Stages 1-3 (n=69)	Stages 4-5 (n=47)	p value
Age			
<50 years	16 (23.2%)	9 (19.1%)	$p > 0.05$
≥ 50 years	53 (76.8%)	38 (80.9%)	
Gender			
Male	37 (53.6%)	31 (65.9%)	$p > 0.05$
Female	32 (46.4%)	16 (34.0%)	
Duration since diagnosis			
1 – 5 years	38 (55.1%)	31 (65.9%)	$p > 0.05$
6 – 10 years & >10 years	18 (26.1%)	10 (21.3%)	
Unknown	13 (18.8%)	6 (12.8%)	
Dialysis			
Yes	7 (10.1%)	21 (44.7%)	$p < 0.05$
Comorbidities			
Hypertension	42 (60.9%)	37 (78.7%)	$p < 0.05$
Diabetes	37 (53.6%)	30 (63.8%)	$p > 0.05$
Erythropoietin (EPO) usage			
Yes	16 (23.2%)	24 (51.0%)	$p < 0.05$
No	57 (76.8%)	23 (49.0%)	

Table 2: Haematological characteristics of patients with chronic kidney disease

Characteristic	Stages 1-3 (n=69)	Stages 4-5 (n=47)
Anaemia		
No (n=38)		
Male	12 (17.4%)	4 (8.5%)
Female	17 (24.6%)	5 (10.6%)
Yes (n=78)		
Male	25 (36.2%)	27 (54.4%)
Female	15 (21.7%)	11 (23.4%)
Severity of anaemia		
Mild*	18 (45.0%)	13 (34.2%)
Moderate**	19 (47.5%)	22 (57.9%)
Severe***	3 (7.5%)	3 (7.9%)
Morphological type of anaemia		
Dimorphic	6 (15.0%)	5 (13.2%)
Hypochromic microcytic	5 (12.5%)	6 (15.8%)
Macrocytic	1 (2.5%)	0 (0.0%)
Normochromic normocytic	28 (70%)	27 (71.0%)
Anisopoikilocytosis		
Mild	59 (85.5%)	38 (80.8%)
Moderate	10 (14.5%)	9 (19.2%)
Neutrophils		
Hypersegmented	50 (72.5%)	28 (59.6%)

CKD - chronic kidney disease, *Hb 110-119 g/L for females and 110-129 for males, **Hb 80-109 g/L, ***Hb lower than 80 g/L

Table 3: Association of complete blood count parameters with the stages of chronic kidney disease among the study population

Parameter	Stages 1-3 (n=69)	Stages 4-5 (n=47)	<i>p</i>
Red cell count x10 ¹² (L)	4.22 (1.28-5.9)	3.83 (2.37-6.21)	p<0.05
Hb (g/L)	117.8 (52-168)	108.4 (6.1-16.8)	p<0.05
PCV (%)	34 (14.9-47.1)	31.4 (17.9-50)	p<0.05
MCV (fL)	81.1 (49.9-115.8)	82.5 (65.0-94.2)	p>0.05
MCHC (g/dl)	34.1 (13-38.3)	34.2 (29.7-38.4)	p>0.05
RDW CV%	14.4 (5.1-21.4)	14.8 (5.2-30.8)	p>0.05
WBC x10 ⁹ (L)	8.6 (1-18.3)	7.5 (2.6-12.0)	p<0.05
PLT x10 ⁹ (L)	243 (20-475)	209 (71-363)	p<0.05

Hb – Hemoglobin, PCV – Packed cell volume, MCV – Mean Corpuscular Volume, MCHC – Mean Corpuscular Hemoglobin concentration, RDW – Red Cell Distribution Width, WBC – White Blood Cell Count

Table 4: Association of clinical characteristics and the haematological changes with anaemia among the study population

Characteristic	Anaemia (n=78)	No anaemia (n=38)	<i>p</i>
Comorbidities			
Hypertension	54 (69.2%)	25 (65.8%)	p>0.05
Diabetes	49 (62.8%)	17 (44.7%)	
Both present	44 (56.4%)	11 (28.9%)	
Both absent	18 (23.0%)	8 (21.0%)	
Dialysis			
yes	19 (24.4%)	9 (23.6%)	
Anisopoikilocytosis			
Mild	62 (79.5%)	35 (92.1%)	p>0.05
Moderate	16 (20.5%)	3 (7.9%)	
Neutrophils			
Hypersegmented	56 (71.8%)	22 (57.9%)	p>0.05
Blood picture			
Dimorphic	11 (14.1%)	5 (13.2 %)	p>0.05
Hypochromic microcytic	11 (14.1%)	1 (2.6%)	
Macrocytic	1 (1.3%)	0 (0.0%)	
Normochromic normocytic	55 (70.5%)	32 (84.2%)	
CBC parameters			
RDW CV%	14.4 (5.1-21.4)	14.5 (12.1-30.8)	p>0.05
WBC x10 ⁹ (L)	7.9 (1.0-17.8)	8.5 (4.4-18.3)	p>0.05
Platelet x10 ⁹ (L)	225 (20-365)	238 (114-475)	p>0.05

RDW – Red Cell Distribution Width, WBC – White Blood Cell Count

As comorbidities, there were 79 (68.1%) patients with hypertension and 67 (56.8%) patients with diabetes mellitus. A total of 56 (48.2%) patients had both diabetes and hypertension and of them 44 (78.5%) were anaemic (Table 1 and 4). Of the patient characteristics assessed, hypertension, dialysis and erythropoietin treatment showed statistically significant association with CKD stages ($p < 0.05$) (Table 1). The mean Hb concentration of the study population was 114 g/L (52 - 168 g/L). There were 78 (67.2%) patients with anaemia and of them, 52 (66.6%) were males and 26 (33.3 %) were females (Table 2). The mean Hb of the anaemic group was 104 g/L (52-129 g/L) and of the non-anaemic group was 135 g/L (120-168 g/L). Of the total anaemic patients, the majority ($n=40$, 51.3%) belonged to CKD stages 1-3 (Table 2).

Majority of patients had normochromic normocytic anaemia ($n=55$, 70.5%) and mild anisopoikilocytosis ($n=97$, 83.6%) (Table 2). Of the total anaemic patients, 34 (43.6%) were on erythropoietin and 9 (11.5%), 2 (2.6%) 15 (19.2%) were on iron, folate and vitamin B12 supplements respectively. Participants were categorized into two groups based on the median (14.1%) of baseline RDW of the study (low: RDW < 14.1%; high: RDW \geq 14.1%). RDW CV% ranged from 5.1 to 30.8 and 46.5% of all the participants had RDW CV% above 14.1. Of the anaemic patients, 51.2% and of non-anaemic patients 36.8% had RDW CV% above 14.1 ($p > 0.05$). CKD stages 1-3 had 26% and CKD stages 4-5 had 46.8% patients with RDW CV% above 14.1 ($p < 0.05$). Hypersegmented neutrophils were observed in blood smears of 78 (67.2%) patients (Table 2). The percentage of hypersegmented neutrophils were higher in patients with CKD stages 1-3 ($n=50$, 72.5%) than 4-5 ($n=28$, 59.6%) and in anaemic patients ($n=56$, 71.8%) than in non-anaemic patients ($n=22$, 28.2%) ($p > 0.05$) (Table 2 and 4). The RBC, Hb, PCV, WBC and platelet counts of patients in CKD stages 4-5 were significantly lower than those of the CKD stages 1-3 ($p < 0.05$) (Table 3). There were no significant differences between comorbidities, anisopoikilocytosis, hypersegmented neutrophils, blood picture findings, RDW CV%, WBC count and platelet count of anaemic patients and non-anaemic patients ($p > 0.05$) (Table 4).

Discussion

In this cross-sectional study on patients with CKD, we explored the association of haematological

findings with CKD stages and severity of anaemia. Similar to previous studies carried out in Sri Lanka, in this study too more males had CKD (27, 28). Although the mean age of this study (57.5 years) was in consistent with a similar study carried out in several districts of Sri Lanka (58.4 years) (29), one study carried out on 130 CKD patients in three cities of different provinces demonstrated that younger patients being affected more by the disease (Madawachchiya: 44.05 years, Yatinuwara: 52.06 years, Hambantota: 49.55 years) (30). A study carried out in Anuradhapura district showed a mean age of 46 years while another study carried out on 125 patients in Madawachchiya showed a mean age of 43 years (27). The predilection of the disease to male gender and to the working age group increases the economic burden of the country.

The high prevalence of CKD in western countries is attributed predominantly to hypertension, type 2 diabetes mellitus and ageing population (31). Confirming a similar trend of comorbidity in East Asia during the past 10 years (32), our study too showed high prevalence of hypertension (68.1%) and diabetes mellitus (56.8%) as associated comorbidities. Highlighting the influence of demographic and geographical factors on comorbidities, the study carried out in three cities on 130 CKD patients in different provinces in Sri Lanka showed different prevalences of diabetes mellitus (Madawachchiya: (3.9%, Yatinuwara: 73.5%, Hambantota: (42.4%) and hypertension (Madawachchiya: (52.3%, Yatinuwara: 64.7%, Hambantota: 34.6%) (30).

A significant number of patients in the CKD stages 4-5 in this study were on dialysis ($n=21$, 44.7%) and erythropoietin ($n=24$, 51%). The percentage of anaemic patients in this study on erythropoietin was 43.6%. According to literature, erythropoietin treatment rates reported are typically low (10–15%) (22). Erythropoiesis stimulating agents such as erythropoietin are effective only when iron is readily available thus, iron supplements should be given with erythropoietin. However, in this study only 9 (11.5%), 2 (2.6%) and 15 (19.2%) patients were given iron, folate and vitamin B12 supplements respectively. National Ambulatory Medical Care Survey (1996– 2002) analysis has shown that supplemental iron was prescribed only for 10% of outpatients with CKD who had anemia (22). Another study in the United States revealed that anaemia in CKD is treated only when the Hb

levels are <110g/L (33). NHANES; 2007–2010 study reported a treatment rate of 22.8% of CKD patients with anaemia (22). A substantial number of patients in this study were unaware of the supplements they were given. This highlights the importance of education of patients even on their drug treatment to increase the compliance and the outcome.

Anaemia, a well-known complication of CKD, is multifactorial in origin. The prevalence of anaemia in this study was 67.2%. The prevalence of anaemia in a study carried out on 119 CKD patients in Girandurukotte and Wilgamuwa, Sri Lanka was 72.3% (34) and in another study done in Kandy, Sri Lanka, it was 77.31% (35). Similar to other studies, this study too did not show any association between the prevalence of anaemia and level of education, employment, and duration since diagnosis of CKD (36). The cross-sectional nature of the study and the limited information received narrowed the ability to show any direct cause and effect relationship between the collected data and the development of anaemia in these patients.

The RBC, WBC and platelet counts were significantly lower in patients with CKD stages 4-5 than CKD stages 1-3 in this study. Mixed results have been shown in different studies on the predictive role of WBC on declining kidney function. While some have shown elevated WBC count as a strong predictor of declining kidney function (7) others have shown that in the elderly, low WBC count was associated with progression of CKD (8). However, few studies could not find any association between RBC and WBC counts with progression of CKD (37, 38). Although the potential role of the high neutrophil/lymphocyte ratio as a predictor of poor renal outcomes have been demonstrated in some studies (14, 15), it was not analyzed in this study as these variables were not available. The predictive value of RDW on CKD and its outcomes have been suggested in few studies (15, 39). RDW measures the broadness of red cell size distribution which is usually called anisocytosis and is considered a marker of iron, vitamin B12, and folate deficiencies, inflammation, and other haemopoietic disturbances (16). CKD stages 4-5 had a significantly higher percentage of patients with RDW CV% compared to CKD stages 1-3 in this study. This finding is consistent with the observations of other studies which show the association of RDW and progression of CKD (18-20, 40).

Anisopoikilocytosis is seen in blood disorders (e.g. thalassaemia intermedia), chronic disorders (e.g. CKD) and in nutritional deficiencies (e.g. iron, vitamin B12, and folate deficiencies) (16). The presence of moderate anisopoikilocytosis more in anaemic patients than in non-anaemic patients in this study probably reflects the progressiveness of anaemia, the multifactorial nature of its pathogenesis and the deranged erythropoiesis in advanced CKD.

Hypersegmentation of neutrophils and macrocytic anaemia are usually found together in patients with chronic vitamin B12 or folate deficiency. Interestingly, 78 (67.2%) patients in this study had hypersegmented neutrophils in their blood smears which was predominant in the anaemic group but only one patient had macrocytosis. Studies have demonstrated the presence of hypersegmented neutrophils without macrocytosis in folate deficiency and uraemia (41, 42). The high percentage of CKD patients having hypersegmented neutrophils and high RDW CV% (>14.1) in this study might be reflecting their poor nutritional status or deteriorating kidney function. Further studies are recommended to ascertain the underlying causes for above findings in patients with CKD.

Conclusion

Advanced CKD is associated with significantly low RBC, WBC and platelet counts and significantly high RDW CV%. Therefore, these haematological parameters can be used as surrogate markers to predict progression of CKD. A substantial number of patients with CKD had hypersegmented neutrophils. This needs further studies to ascertain underlying pathological basis.

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Institutionalization of postpartum intrauterine device service: A story of successful implementation

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Abstract

Many women wanted to delay the next pregnancy after a child birth, but are unclear about post-partum family planning (PPFP). The Postpartum Intra-Uterine Device (PPIUD) is a new modality of contraception which is a long acting, reversible and low-cost contraceptive option. It can be placed within 48 hours of delivery. The process of planning and implementing the initiative of PPIUD in Sri Lanka with the Federation of International Gynaecologists and Obstetricians (FIGO) and sustainability of the programme with the analysis of available evidence are described. The Collaboration of Sri Lanka College of Obstetricians and Gynaecologists (SLCOG) and Family Health Bauru (FHB) and hospital-based leadership for the training-the-trainer models were successful. As the initiative progressed, additional steps were addressed with the involvement of the project steering committee and a data safety monitoring committee, audits of structure and process, and regular feedback of each center's performance to stimulate maintenance and enhancement of activities. Uptake rate remained low at 3.1%. There were no major complications reported in keeping with the safety of the procedure. Postnatal follow-up was challenging in many centers. The successful implementation of PPIUD initiatives in Sri Lanka backed by the commitment of the professional leadership.

Keywords: Counseling; Family planning, FIGO initiative, Implementation, PPIUD, Postpartum intrauterine device.

Introduction:

Postpartum Family Planning (PPFP) is one of the most important strategies to accomplish goals of achieving a healthy newborn and mother to avoid unwanted births in order to ensure a healthy inter-pregnancy interval and limit the number of children according to the parents' wishes¹. On average fertility returns after three weeks in a non-breast-feeding mothers, six weeks while breast feeding and two weeks after a miscarriage respectively². It has been estimated that two out of three women have an unmet need (i.e., woman needs to prevent pregnancy but does not use any form of contraception) of contraception in the first year following a child birth³. Inter-pregnancy intervals of two to four years are recommended by WHO as it was evident that significant benefits for both the mother and the baby⁴.

Reduced inter-pregnancy intervals have numerous adverse effects to mothers, newborns and older siblings^{5,6}. Inadequate spacing of pregnancies can lead to unplanned and unwanted pregnancies ending with illegal terminations. It has been estimated that for every 10 babies delivered seven had been aborted⁷. The commonest reason for seeking abortions in Sri Lanka has been found to be that the youngest is too small⁸.

Immediate PPFP gives an excellent opportunity to

provide women with this much needed services. Women and their partners have the right to receive accurate information regarding contraception. They have the right to be provided with safe, effective, affordable and acceptable contraception methods of their choice and the freedom to decide when and how many children they should have. These are considered as reproductive and health rights for a couple. Female sterilization is the only immediate PPFP option currently available to women in the local setting.

The Postpartum Intra-Uterine Device (PPIUD) is possible after vaginal delivery as well as caesarean delivery. The failure rate is about 1 in 1000 insertions⁹. It is a convenient, cost-effective method specially for women who cannot return for follow up because of distance, travel costs, time constraints, or other barriers to access. Compared to interval insertion PPIUD as three important advantages which are hardly any perforations, minimal or no discomfort and less infections. However expulsion rates could be higher. Proper training, correct insertion and use of long curved Kelly forceps significantly reduce the expulsion to 2% which is equal to the expulsion rate of the interval procedure¹⁰. Sri Lanka has very well organized maternity and child care service which enables adequate counseling for postpartum

contraception antenatally. Since more than 99 % deliveries occur in hospitals, implementation of the PPIUD initiative was feasible. As approximately 80% postnatal women are visited by community midwife effective follow up was also possible. As virtually all infants are brought back for immunization this enables follow up of mothers as well¹¹. A Cochran review carried out in 2003 has shown that PPIUD program to be safe and effective in different setting¹². In 2015 and 2016 offering PPIUD insertion within 48 after delivery has been recommended both in UK¹³ and USA¹⁴ respectively.

PPIUD Initiatives:

The PPIUD Initiative was a national project conducted by Sri Lanka College of Obstetricians and Gynaecologists (SLCOG) in collaboration with Family Health Bureau (FHB) and funded by the International Federation of Obstetrics and Gynecology (FIGO). Sri Lanka was the first country to be selected for this as we have a well-structured maternity care delivery system with excellent health care indicators. Further, the SLCOG which is committed to promote and ensure women's health in the country. Figure 1 provides how the project was managed at international, national and facility levels.

The national steering committee consisted of the SLCOG president and consultant Obstetricians and Gynaecologists who the leaders were promoting the initiative. It also included a FIGO representative /facility coordinators /representative from FHB and

Medical Officer of Maternity and Child Health (MO MCH). Data collecting officers (DCOs) were recruited as full time or part time basis for different periods. DCO were pre-interns, nursing officers and Public Health Midwives (PHM'S). The Teaching Hospital Mahamodara (THM) was one of the six teaching hospitals where phase one of the multi centre initiative was implemented for a period of four years from 2014 to 2018. Ethical approval was obtained from the Faculty of Medicine, University of Ruhuna prior to the commencement of the initiative.

Approval was also obtained from SLCOG to publish THM data separately in addition to these data being included in the national report. The Steering committee worked hard to develop a roadmap and blueprint for the project. Several brainstorming workshops were conducted for this purpose. This was followed by education and training of trainers, hospital staff, community staff and DCOs. A group of Master trainers were identified and trained in each center by cross country experts. The training included counseling, obtaining informed written consent, insertion and follow up as well as how to train others to do the same. Several brainstorming sessions were conducted in different settings which were well attended and all the participants enthusiastically contributed. Community training programs were arranged as one day workshops and these too well attended. Several hands-on training workshops were conducted for the hospital staff. And these included lectures, video demonstration and hands on training of insertion on mannequins.

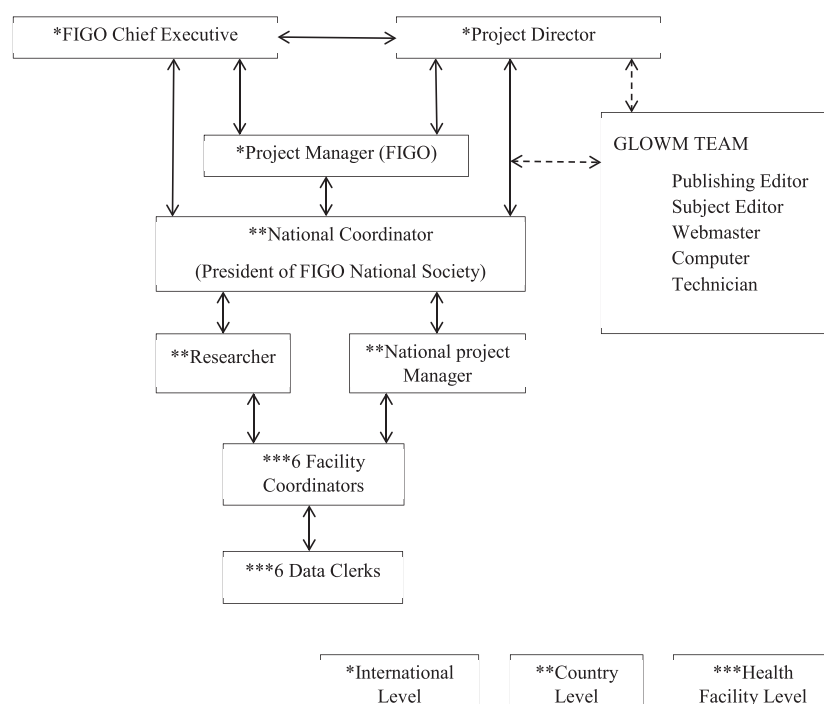


Figure 1: Monogram of the PPIUD Initiatives

The learning curve for insertion of PPIUD was very short, and a certificate of competence was issued. Device used as a PPIUD is the same Cu T that was used for interval insertion. Proper placement of the IUD was the most important step in order to reduce spontaneous expulsion. A 33 cm long Kelly forceps were used for the insertion of PPIUD. The IUD was inserted up to the isthmus of the MAMA-U manikin, and then the manikin was pushed ventrally to straighten the uterine axis. Then the IUD was pushed upwards to ensure proper fundal placement. The DCOs had comprehensive training on a web-based cloud application data entry portal.

For effective counseling information, education and communication materials were developed in both Sinhala and Tamil. Antenatally, education and counseling were provided in both hospital and community settings. The importance of PPFP, available methods and timing were explained, with special emphasis on the PPIUD. Women who made an informed verbal choice had purple stickers pasted on their hand held notes. Upon admission to hospital for delivery IWC was obtained from women wishing to have PPIUD. Post-placental insertion was done in the labour room or in the operating theatre by a trained clinician. Ultrasound scan was carried out prior to discharge to confirm that the PPIUD is in situ. The FHB provided an uninterrupted supply of PPIUD insertion packs. A Follow up card was issued at the time of discharge. Data entry was done in three different settings. Part A was completed by the doctor who inserted PPIUD. Part B was completed by a DCO in the postnatal ward prior to discharge of women. Part C was completed by the MOH at each follow up visits at the field/community levels. The field staff carried the responsibility of the subsequent follow up. Women were advised to come for review at 6 weeks, 6 months and 18 months. During each visit the nursing sister attached to the medical health division carried out a speculum examination to visualize the threads. If there were any complications related to the PPIUD, she was urgently referred to the hospital. Follow up data were entered at each follow up visit to the part C of data collection form by the relevant MOH and sent monthly to the center. Maintenance of uniformity and quality assurance of the initiative were major challenges that we faced in this multi centre initiative. The Data Safety Monitoring Board monitored the clinical risk to the clients. Facility coordinators evaluated the initiative on a continuous basis. Grouped data were compiled and evaluated monthly

at national level. Feedback was obtained from the community and hospital staff to maintain sustainability of the initiative. Refresher training was arranged for the staff on a regular basis.

Studies

Study1: Preliminary Study on PPFP

Preliminary study was conducted to answer three questions regarding PPFP in women of reproductive age: what do they know about PPFP? what are their attitudes towards it? And whether the multiparous women practiced it? This was a cross sectional study conducted in the postnatal wards at THM in 2015. It included a convenient sample of 300 women. A validated interviewer administered questionnaire was used to collect data. Study found that approximately half the women had a poor knowledge about PPC. However, 80% of women wished to use some form of contraception after the current delivery. 30% of women had not used any form of contraception. Therefore, this is an unmet need of 30 %. About 40 % of them had used the COCP, but the timing of method was unfortunately not documented. 20% of mothers had IUD after 6 weeks of delivery as an interval procedure. Therefore it was concluded that overall awareness of PPFP was unsatisfactory among postnatal mothers and that it needed improvement. Many women wanted to use a contraceptive method after childbirth, but were unclear about PPFP. Unmet need of contraception among postnatal mothers remained unacceptably high. This was published in the GMJ in 2018¹⁵.

Study2: Post Implementation Evaluation of PPIUD Initiative at THM

After the implementation of the PPIUD services at THM, A study was conducted to describe how we implemented the PPIUD services and also to determine its feasibility, success and safety. It was a retrospective cross-sectional study on women who had delivered their babies at THM during the period of four years from 2014 to 2018. Data was analyzed from hospital delivery notes, postnatal records and follow up details. There were forty six thousand eight hundred fifteen deliveries during the study period. But only about half of them had been counseled antenatally regarding PPFP. Although 14051 of these women had made an informed choice to receive PPIUD, when these women were interviewed again on admission to hospital only 772

reconfirmed their choice of a PPIUD and gave IWC. Of these only 470 of them had a PPIUD inserted. This corresponded to approx. 1% out of the total deliveries. Out of these 470 insertions 309 were after vaginal delivery and 161 were after caesarean delivery. Unfortunately, there was no data available as to the reasons for non insertion of PPIUD in 263 women who had made an informed choice and given IWC (figure 2).

The complications and outcomes of follow up women with PPIUD were described in Table 1. In 20 women there were technical problems at insertions. One mother changed the decision and underwent sterilization. Unfortunately, only 25% of women returned for follow up and therefore we were unable to properly evaluate either the safety or effectiveness of the PPIUD. 14 expulsions and 13 discontinuations were reported.

Table 1: Safety and Effectiveness (n= 470)

	Frequency	%
Did not return for follow up	351	74.6
PPIUD in situ (Uncomplicated)	95	20.2
Complications		
Perforation	0	
Abdominal pain	1	
Infection (Vaginal/ Pelvic)	3	
Irregular bleeding	4	
Effectiveness		
Pregnancy	0	
Expulsion	14	2.9
Discontinuation	13	2.7

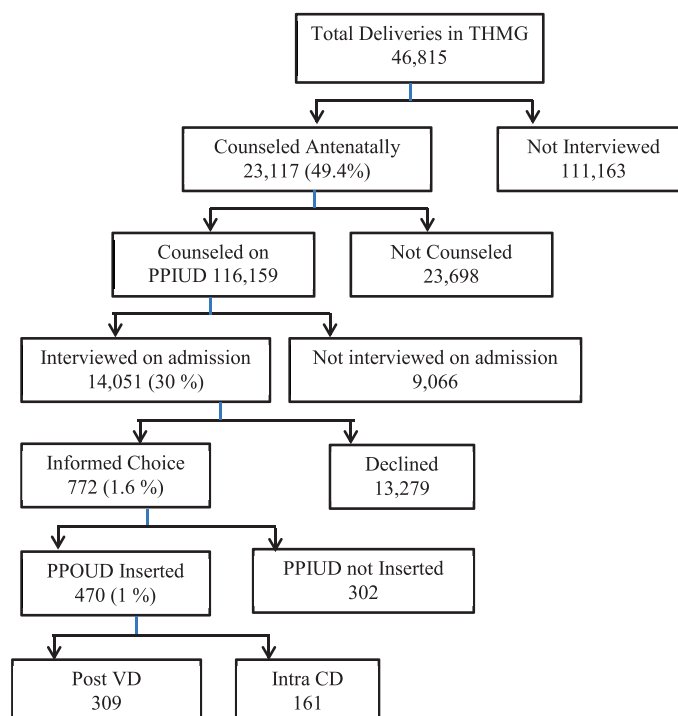


Figure 2: Results of Post Implementation Evaluation of PPIUD Initiative at THM

In conclusion, PPIUD was successfully implemented at the THMG after education and training of health staff. However the uptake was very low. In addition, the safety and effectiveness also could not be evaluated because of a very low return for follow up (25%). This study was published in BMC Research note as single centre experience on implementation of the PPIUD in Sri Lanka in 2020¹⁶.

We faced several challenges during this initiative. Fundamentalists interpreted PPFP as an unjustified option for postnatal women. They believed that enhancement of FP and introduction of new methods of FP would lead to a reduction in the proportion of the major ethnic group in Sri Lanka. Many clinicians were reluctant to participate although they knew the benefits of birth spacing and expanding choices in FP. Further, there was inaccurate and adverse publicity from the media which had caused everlasting damage. FP being introduced to limit the size of certain ethnic groups meant that obstetricians became reluctant to participate despite their clinical understanding of benefits of birth spacing and expanding choices in FP. Despite all challenges the team had all courage to continue the project with the understanding of the ultimate outcome as benefit to women's health in the country. FIGO recognized the project as a successful initiative. The Government of Sri Lanka issued a circular in 2017 in order to strengthen the PPFP services provided by curative institutions. Master trainers were appointed to different regions of the county to train other doctors to provide PPIUD services and also to evaluate the services.

Study 3: Four Years of the FIGO Postpartum Intrauterine Device in SRI Lanka: Pilot initiative to national policy

This study was carried out four years after the commencement of the PPIUD initiative. The Objective was to analyze the difficulties and challenges which arose when PPIUD services were introduced into the health system. In 2013, the initiative commenced in six teaching hospitals across the country. This was phase one. In 2015, it was expanded to another 12 hospitals. This was phase two and it continued up to 2017. There were training programmes for the stakeholders, counseling of women and insertion of PPIUD and follow up.

There were 295,596 deliveries during the four years of the initiative (Figure 3). 62% of them had been interviewed antenatally and more than half of them had been considered to be suitable and therefore counseled for the insertion of a PPIUD. Therefore 116,159 women had a purple sticker attached to their antenatal clinics records. When admitted for delivery 11,339 women which was about 3.8% of the women who had delivered, had given written informed consent. PPIUD insertion was carried out in 9,346 women. Therefore the uptake was 3.1% of the total deliveries in the 18 hospitals during the periods of study. Unfortunately only 34% of women who had a PPIUD insertion during the period of study returned for follow up. Therefore a proper evaluation of safety and effectiveness could not be carried out. The reported perforation rates and expulsions were zero and 2.9% respectively.

As the PPIUD was successfully introduced into the 18 participating hospitals, as a method of contraception, the PPIUD was included as a method to the national family planning programme of Sri Lanka in 2017. This was published in the IJGO which is the official journal of the FIGO in 2018¹⁷.

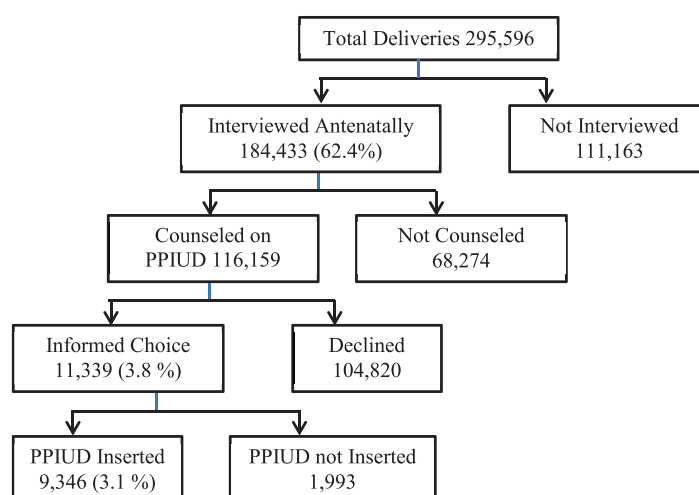


Figure 3: Summary results of four years of the FIGO PPIUD insertion in Sri Lanka

Study 4: Location & Content of Counseling and Acceptance of PPIUD in Sri Lanka

This study was carried out in four hospitals in Sri Lanka with the objective of determining the relationship between the location & content of counseling and the women choosing the PPIUD as a method of PPFP. This was a descriptive cross sectional study done for five months from January 2015. Data were collected from all postnatal mothers regarding place/s of counseling, content of counseling (quality), acceptance of PPIUD and insertion of PPIUD. Almost all pregnant women were counseled antenatally on PPIUD. Most common place of counseling was the field clinic. PPIUD insertion rate was 4.9%. It was concluded that high quality counseling was more likely to be provided in hospital wards and hospital clinics. Hospital-based counseling was also linked to higher PPIUD uptake and women of were more likely to be given information about the risks and alternatives to PPIUD. This study was published in the International journal of Reproductive health in 2017¹⁸.

Study 5: The effect of a PPIUD intervention on counseling & choice: evidence from a cluster-randomized, stepped-wedge trail in Sri Lanka

The objective was to determine whether the incorporation of the PPIUD as a method of PPFP had an effect on the counseling of women by HCW and the informed choice of PPIUD by women. Six hospitals,

consisting of three pairs matched according to geography, ethno linguistic composition and obstetric load, were randomized into two groups and conducted from September 2015 onwards for more than 2 years.

Flow chart in Figure 4 explains the summary result of the study. 39,084 postnatal women (i.e., 96.8% of all who delivered during the period of study) participated in the trial. The key interventions of the PPIUD initiative were implemented. Interventions were introduced in two groups of hospitals with different timing: three and nine months after baseline data collection. Outcomes were rate of counseling/informed choice in two different settings. The incorporation of the PPIUD as a method of PPFP increased the rates of counseling of women by HCW in the community & Clinicians in hospitals by an average of 30.7 percentage points & also possibly increased rates of women choosing PPIUD by an average of 2.7 percentage points.

It was shown that the incorporating PPIUD services into the postpartum care was feasible and potentially effective in Sri Lanka. It had a generally positive impact on women receiving counseling regarding the PPIUD and, to a lesser degree, on their choosing the PPIUD for PPFP. It was published in the journal "Trials" in 2019¹⁹.

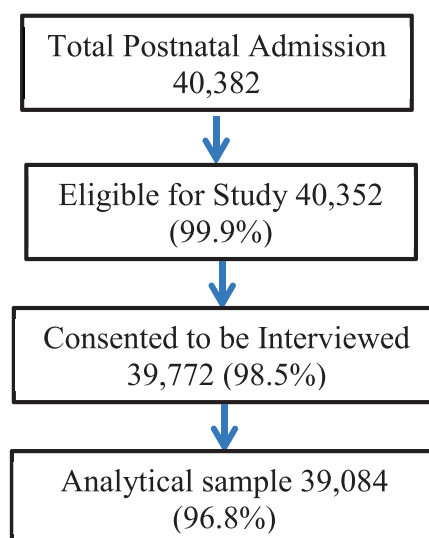


Figure 4: Summary results of the effect of a PPIUD intervention on counseling & choice

Study 6: Planning and Implementation of a FIGO Postpartum Intrauterine Device Initiative in Six Countries

This was a study carried out to describe the process of planning and implementing a program of counseling and delivery of postpartum intrauterine devices (PPIUD) in 48 hospitals across six countries in Africa and Asia. Under the phase one six facilities were selected for initiative in Sri Lanka from July 2013. Then expanded to five additional countries in January 2015. There was a high level of data collection reaching 75%. Approximately 6000 clinicians and 2800 field staff trained. Performance of community staff was better than doctors with regards to counseling of women. There was poor follow up rate especially in peripheral clinics. As published in the IJGO which is the official journal of FIGO²⁰, the FIGO PPIUD initiative lead to a great deal of learning regarding planning and implementation of such a project internationally. There was very good involvement of country level and hospital-based leadership. The training the trainer models were successful. Postnatal follow-up was a challenge in many countries which did not have well organized maternity care systems.

Postpartum implants have recently become a popular method of postpartum contraception because they do not require an internal examination and a woman can feel the device in her arm at any time and hence be reassured that she has a contraceptive method in place. This is an important factor in Sri Lanka, where termination of pregnancy is not a legal option. The low follow-up rate of 34% was a concern. It is difficult to motivate women to attend follow-up clinics, especially after delivery when they do not have any problems. Therefore, it can be assumed that women who did not attend did not have any complications. Collaboration with the Ministry of Health and its directorates was crucial from the start for implementation and subsequent successful nationalization of this initiative. The government's Family Health Bureau was involved from the outset in the planning, design, and implementation of the initiative over the 4-year period. The importance of this cannot be understated when discussing the successes of the initiative and ease of adoption into the government family planning program. Through ongoing research and development of a shared-learning culture, it is possible to bring the PPIUD service to a more widely available level across Sri Lanka.

Acknowledgement

The investigator is thankful to study participants, all authors and co-authors of studies for their different level of contribution to PPIUD initiative. I appreciate the assistance given by Mrs Rohini Alahapperuma and Miss Kinkini Yatalamaththa for preparation of the manuscript.

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Abstracts

FMAS - 2021

OP-01 Adverse drug reactions among inward patients: An active surveillance at Teaching Hospital Karapitiya

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Background

Adverse drug reactions (ADRs) are a major cause of morbidity and mortality and a significant economic and health burden to most of the countries.

Objective

The aim of the study was to identify the severity of ADRs reported among inward patients of Teaching Hospital Karapitiya (THK).

Methodology

Department of Pharmacology, Faculty of Medicine, University of Ruhuna, a regional center of ADR collection is conducting an active surveillance to report ADRs from THK. This study was based on ADRs reported among patients admitted to Medicine, Surgery, Paediatrics and Dermatology wards of THK from June 2020 to April 2021. The ADRs were classified according to the severity by Modified Hartwig and Siegel scale. Descriptive statistics were obtained using SPSS statistical software.

Results

A total of 79 ADRs was collected. The majority (64.6%) of the victims were females. Among the total, 75.9% were adults and 24.1% were paediatric patients. Out of ADRs collected 14 (17.7%), 42 (53.2%), 22 (27.8%) and 1 (1.3%) were categorized as mild, moderate, severe and fatal reactions respectively. The fatal reaction was due to a transfusion-associated circulatory overload.

Among 22 of severe ADRs, 18 (81.8%) were anaphylactic reactions. Other four were seizure, lower limb paralysis, Stevens-Johnson syndrome and DRESS syndrome. Fifteen (68.2%) severe reactions were due to antibiotics. Two were due to vaccines. Intravenous immunoglobulin, anti-rabies serum, diclofenac sodium, antacid and omeprazole caused one severe reaction each. Among the antibiotics 4 (26.7%) were due to cloxacillin. Ceftriaxone and co-amoxiclav caused 3 (20%) reactions each. Eight (34.8%) patients with severe reactions had a history of drug allergy.

Conclusions

One third of ADRs reported from THK during last year were severe and fatal reactions. The majority of them were due to antibiotics. One third of patients with severe reactions had a history of drug allergy.

Key words

Adverse drug reactions, Anaphylaxis, Antibiotics

OP- 02 Assessment of risk of relapse following institutional rehabilitation of males addicted to drugs in Sri Lanka: Survival analysis approach

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Background: Institutional rehabilitation is the main option available in Sri Lanka for addiction treatment. Relapse is a major problem encountered following rehabilitation.

Objective: This multicenter study aimed to estimate the survival without relapse and associated variables among males addicted to drugs in Sri Lanka using the survival analysis approach.

Methods: An institution and/or community-based cross sectional study with a follow up was conducted among 189 males addicted to illicit drugs who were randomly selected among total admissions of 431 in 2018 from five rehabilitation centers in Sri Lanka. Male drug addicts who were discharged from the rehabilitation centers after completing their rehabilitation period were included in the study. The relapse rate was calculated as the number of drug addicts who relapsed after rehabilitation per 100 of rehabilitated drug addicts followed up during the same time period. The survival without relapse was assessed at three months and at six months after discharge. To assess associated variables, relevant data were extracted from the survey database on drug use behavior and related information during the institutional rehabilitation process. Survival analysis was performed using SPSS software to determine the survival without relapse and associated factors at 0.05 significance level.

Results: At the end of six months, the relapse rate was 59.6%, excluding six drug users (3.2%) who were lost to follow-up. The mean (SD) and median duration (IQR) of survival without relapse was 5.6 ± 5.2 weeks and 4 (7) weeks respectively. In the first three months, the cumulative survival rate without relapse was 51.3%, while at the end of six months it was 40.4%. Drug users less than 25 years of age (OR=0.504, 95% CI; 0.26 to 0.96) and who had satisfactory follow-up by respective rehabilitation center after discharge (OR=0.614, 95% CI; 0.38 -0.99) had statistically significant survival without relapse based on the Cox regression model.

Conclusion and Recommendation: Survival without relapse following rehabilitation was unsatisfactory with a very low mean survival duration. More attention should be paid to follow-up after the rehabilitation process, especially among older drug users, to prevent relapses following rehabilitation.

Keywords: male illicit drug users, rehabilitation centers, relapse, survival analysis

OP-03 Evaluation of *in vitro* anticandidal properties of *Allium sativum*

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Background:

Candida albicans and non-*albicans Candida* are known to cause invasive infections increasingly in immunosuppressed individuals. Antifungals used to treat these infections have become limited in value due to toxicity and the emergence of resistance. This necessitates the development of novel antifungal agents with low toxicity and novel mechanisms of action.

Objective:

To determine the anticandidal action of *Allium sativum* (garlic)

Methodology:

Dried garlic extractions were prepared using different solvents hexane, dichloromethane, ethyl acetate, methanol, and distilled water. Aqueous extract of fresh garlic was also prepared following the domestic preparation method that has been employed in folklore medicine. Extracts were tested in duplicate against control isolates of *C. albicans* and *C. glabrata* and ten clinically isolated *C. albicans* and non-*albicans Candida* by agar well diffusion method and broth microdilution method.

Results:

Out of the six extracts, only the aqueous extract prepared by domestic preparation method showed zones of inhibition, 25.5 ± 2.1 mm and 21.5 ± 0.7 mm respectively against control strains of *C. albicans* and *C. glabrata*. All the clinical isolates except one showed zones of inhibition around domestically prepared extract. Clinical isolates did not show zones of inhibition around fluconazole. Only the domestically prepared extract gave minimum inhibitory concentration (MIC) of $< 1/256$ for both *C. albicans* and *C. glabrata*. All the clinical isolates showed MICs $\leq 1/8$ with the domestic preparation. Minimum fungicidal concentrations (MFC) of it against both control strains were $< 1/64$ and against clinical isolates, MFCs were either $\leq 1/8$. Low MICs and MFCs were observed with the garlic domestic preparation than with fluconazole.

Conclusion:

In conclusion, garlic has a potent anticandidal activity, when prepared by the domestic preparation method. These observations rationalize its traditional use as an antifungal remedy.

Key Words: anticandidal action, *Allium sativum*, *Candida albicans*, non-*albicans Candida*

OP-04 Dengue virus serotype prevalence based on molecular evidence in patients admitted with dengue in the Galle district, Sri Lanka

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Background

Dengue is an important endemic disease in Galle district with frequent deaths associated with severe disease. Antibody prevalence data and serotype distributions are important in the management of dengue.

Objective

The purpose of this study was to identify the serological evidence and associated stereotypes in patients admitted with dengue.

Methodology

A cross-sectional study was conducted in Teaching Hospital Karapitiya, Base Hospital Balapitiya and Elpitiya enrolling patients with laboratory confirmed acute dengue with platelet count of less than 100 000/ μ l.; from June 2017- July 2019. NS1, IgM, IgG and serotyping by PCR were performed, depending on the day of fever.

Results

A total of 1679 patients, including 1074 males and 597 females with a median age of 32 (IQR 23-45) years participated. Acute dengue was confirmed by positive NS1 in 464 patients with fever for ≤ 6 days or by IgM in 523 patients with > 6 -day fever. A total of 330 had secondary dengue, confirmed by positive IgG along with positive NS1 or IgM. Amongst monotypic samples the highest proportion was reacting against DEN2 (n=511, 30.4%) followed by DEN3 (n=43, 2.6%), DEN1 (n=29, 1.7%) and DEN4 (n=7, 0.4%). However, there was no significant association with the stereotype and the occurrence of severe disease. There were 24 polytypic samples. DEN2 and DEN3 were seen more commonly in adults rather than children (29.8% vs. 18.2% and 1.8% vs. 0.8%, respectively), while DEN1 was seen more commonly in children (1.5% vs. 1.1%), p=0.047.

Conclusions

None of the stereotypes were significantly associated with severe dengue. However, secondary dengue is more likely to be diagnosed with DEN2 than primary dengue. There is a significant association between the type of the virus and the age group affected. This highlights the importance of dengue surveillance and its influence on policy making on future vaccine approval and the potential need for different vaccine composition.

Keywords: laboratory diagnosis, severe dengue, serotypes of dengue virus

OP-05 Prevalence of *Staphylococcus aureus* and methicillin-resistant *S. aureus* in humans, animals and livestock products in Southern Sri Lanka

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Background: *Staphylococcus aureus* is a pathogenic bacterium that causes both minor and severe infections in humans and animals. Strains that are resistant to methicillin (methicillin-resistant *S. aureus*, MRSA), are often associated with severe infections. It is important to do prevalence studies to plan further investigations.

Objective: This study describes the prevalence of *S. aureus* and MRSA isolated from clinical cultures, nasal swabs of farmers and livestock, and livestock products in the southern province of Sri Lanka using One Health approach.

Methodology: *S. aureus* isolates from consecutive clinical cultures were collected from September 2019 to January 2020 (Teaching Hospital, Karapitiya) and from August 2020 to April 2021 (Distract General Hospital, Matara). From November 2020 to May 2021, nasal swabs were collected from farmers who had direct contact with livestock, as well as from randomly selected livestock (cattle, buffalo, pig, goat, and poultry) in the respective farms. At least one livestock product (milk, meat, or egg) was collected from each related farm or retail shop. Standard microbiological testing and antibiotic susceptibility testing were used to identify *S. aureus* and MRSA, respectively.

Results: *S. aureus* was isolated from 366 clinical cultures (mainly pus-68.3% and blood-16.9%). Out of the total, 59.3% were MRSA (pus-60.4% and blood-54.8%). Of 136 nasal swabs collected from farmers, 38 (27.9%) had *S. aureus* and 9 (6.6%) had MRSA. Out of 142 nasal swabs collected from livestock (cattle/buffalo-38.7%, pig-30.2%, goat-20.6% and poultry-6.3%), 22 (15%) had *S. aureus* and 1 (0.7%) had MRSA. Among 78 livestock products tested (milk-69.2%, meat-10.2% and egg-20.5%), 15 (19%) and 2 (3%) showed *S. aureus* and MRSA, respectively.

Conclusions: MRSA prevalence in clinical cultures was high. MRSA was found in farmers, livestock, and livestock products. The presence of *S. aureus* at a considerable level suggests the potential for transmission.

Keywords: MRSA, One Health, Prevalence, *Staphylococcus aureus*, Southern Sri Lanka

OP-06 Anti-apoptotic and anti-inflammatory effects of three medicinal plants against doxorubicin induced myocardial toxicity in rats.

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Background

Doxorubicin causes cumulative dose dependent cardiotoxicity which ranges from undetectable myocardial changes to severe cardiomyopathy resulting in death. Among the multiple mechanisms responsible for cardiac damage, oxidative stress, apoptosis and inflammation play major roles.

Objectives

To determine the effect of three aqueous medicinal plant extracts (*Cinnamomum zeylanicum* bark, *Murraya koenigii* leaves and *Nauclea orientalis* bark) against doxorubicin induced apoptosis, inflammation and DNA fragmentation in Wistar rats.

Methodology

Treatment groups of rats used in the study were as follows. Group 1: control; groups 2,3,4: plant extract controls; group 5: doxorubicin control; groups 6,7,8: each lyophilized plant extract (2.0g/kg, 14 days) and doxorubicin (18mg/kg) on 11th day; group 9: positive control. All animals were sacrificed on day 15, myeloperoxidase (MPO) activity was measured in serum and inflammatory (TNF- α) and apoptotic markers (caspase-3, Bcl-2) and DNA fragmentation (TUNEL assay) were analyzed in myocardial tissues using immunohistochemical staining and the area of expression was quantified.

Results

MPO activity was significantly increased in the doxorubicin-control (285.32 ± 1.64) whereas it was significantly decreased in all three plant extract-treated groups with the lowest value in the *Cinnamomum* treated group (210.46 ± 4.6). Expression of TNF- α and caspase-3 were more pronounced (0.85m^2 , 0.37m^2) but Bcl-2 expression (0.03m^2) was weak in the doxorubicin control. Plant-treated groups showed a significant reduction ($p < 0.05$) in TNF- α and caspase-3 expression while *Cinnamomum* treated group showed the lowest expression (0.08m^2 , 0.03m^2) among the three extracts. A significant increase ($p < 0.05$) in Bcl-2 expression was observed with all three plant extracts with the highest expression in the *Cinnamomum* treated group (0.11m^2). TUNEL positive nuclei were abundant in the doxorubicin control, but they were significantly ($p < 0.05$) reduced in plant-extract treated groups.

Conclusion

All three plant extracts showed a significant reduction in apoptosis, inflammation and DNA fragmentation indicating their cardioprotective effect which was highest in *Cinnamomum zeylanicum* bark extract.

Keywords: apoptosis, cardio protection, doxorubicin, inflammation, wistar rats

PP-01 Importance of 'recalled history' as an indicator of previous chickenpox infection among a sample of medical undergraduates at the University of Ruhuna

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Background:

The presence of antibody to varicella zoster virus (anti VZV) indicates the immunity following chickenpox infection. Instead, recalled the history of chickenpox is often used as an indicator of immunity when deciding post exposure prophylaxis.

Objective:

To assess the validity of 'recalled history of chickenpox' as an indicator of immunity to chickenpox in a sample of medical undergraduates at the University of Ruhuna

Method:

A cross-sectional descriptive study was carried out with convenient sampling involving medical undergraduates of the first and second year at the University of Ruhuna during the period August 2020 to October 2020. Data and blood sample for anti VZV by ELISA were collected following informed written consent.

Results:

A total of 142 undergraduates participated in the study. Median age was 22 (IQR 22 - 23) years. Of them 45.1% gave a history of chickenpox, 47.9% had no history. Ten (7%) undergraduates had received chickenpox vaccination and were excluded from the analysis. Of the 64 undergraduates who had chickenpox, 43.8% had it at the age < 10 years, 18.8% at 10 to 15 years and 34.4% at > 15 years. Two (3.1%) undergraduates could not recall the age when they had the disease.

Anti VZV was detected in 48.5% (64/132) indicating immunity to chickenpox; 95.3% (61/64) of them reported a history of chickenpox whereas 4.4% (3/68) did not give a history. The positive recalled history of chickenpox has a sensitivity 95.3%, specificity 95.6%, positive predictive value 95.3% and negative predictive value 95.6% in predicting the presence of anti VZV.

Conclusion:

Positive recalled history of chickenpox has a good predictive value of immunity in medical undergraduates at the University of Ruhuna. In the absence of anti VZV testing to detect the immunity, the recalled history of chickenpox can be used in deciding the post exposure prophylaxis.

PP-02 A review on analgesic activity of herbs

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Background:

Pain is an unpleasant and somatic sensation of acute ache which occurs as a result of physical damage or disorder affecting the defence mechanism of the body. It is one of the health problems in the world nowadays. Since pain makes people uncomfortable, they tempt to take analgesic drugs which help to relieve pain. There are mainly two sources of these analgesic drugs which are classified as synthetic and natural sources. Due to the adverse effects of these synthetic analgesic drugs, scientists are investigating various sources to find out alternatives. There are herbal plants all over the world that can be used as a source for analgesic drugs.

Objectives:

The main aim of this investigation is to review the herbs that have analgesic activity and phytochemicals, which can be useful in analgesic activity.

Methodology:

The literature search was performed through specialized search databases (PUBMED, ResearchGate, Google Scholar and ScienceDirect) using different combinations of keywords, analgesic activity, acetic acid-induced writhing test and phytochemicals. The inclusion criterion was studies with analgesic activity test in acetic acid-induced writhings and excluded criteria was analgesic activity checked using essential oils and other test methods.

Results:

Out of 73 articles, 30 plants have been recorded with analgesic activity. Medicinal plants, *Phyllanthus amarus*, *Clusia abyssinica*, and *Margaritaria discoidea* in Euphorbiaceae family showed high inhibition percentages, 81%, 49.77%, and 100% consecutively in the acetic acid-induced writhing test. Asteraceae family also had plants that show a considerable amount of analgesic activity. *Trigonella foenumgraecum* showed 75.73 % inhibition in acetic acid-induced writhing test at a very low dose such as 40 mg/kg. Among all 30 plants, more than 10 medicinal plants had flavonoids, tannins, and alkaloids, and 8 had steroids.

Conclusion:

The family Euphorbiaceae, Asteraceae, and *Trigonella foenumgraecum* can be taken into consideration for further research to isolate valuable analgesic drug leads.

Key words: acetic acid- induced writhing, analgesic activity, herbs, phytochemicals

PP-03 Physical activity levels of Advanced Level students in Colombo district, Sri Lanka during a pandemic

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Background:

There is a remarkable relationship between the lack of physical activities and the prevalence of non-communicable diseases.

Objective:

The objective was to describe the physical activity levels of advanced level students in Colombo district, during a pandemic period.

Methodology:

A descriptive, cross-sectional study, using the convenience sampling technique was conducted among 480 Advanced Level students by administering a google form from September 2020 to June 2021. A questionnaire based on international physical activity that was validated in Sri Lanka and modified according to the country's cultural background was used. The sufficiency of physical activities of adolescents was categorized according to WHO recommendations. Students who engaged in physical activities ≥ 7 hours per week were classified as students with sufficient physical activities. Data were analysed using SPSS 26th version. Ethical clearance was obtained from the ethics committee of the Faculty.

Results:

Only 15.1% of the study population had sufficient physical activities across the week. Out of the respondents, $>1/3$ had not engaged in any physical activity during the considered week. Only 7.5% had engaged in physical activities daily.

Usage of exercise instruments was 29.2% and 17.4% had regularly visited gymnasiums, walking paths.

Students who had screen time of >12 hours per day was 12.3% and the students who had spent >12 hours per day while sitting or reclining were 18.5%.

The majority of the participants from the middle-income families, did not sufficiently engage in physical activities compared to low (76.8%) and high (83.0%) income families. The students who engaged sufficiently in physical activities had significantly higher mean general health score value (51.3) compared to insufficiently engaged individuals (39.0).

Conclusions:

The majority of the population had not sufficiently engaged in physical activities across the considered week and the sedentary behaviour was considerably observed.

Key words: adolescents, exercise, non Communicable Diseases, physical activities, sedentary lifestyle

PP-04 Electrocardiographic changes in breast cancer patients who were treated with anthracycline chemotherapy at the Teaching Hospital, Karapitiya

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Background

Anthracyclines are among the most effective anticancer agents but their therapeutic efficacy is hindered due to the dose-dependent cardiotoxicity. Previous studies done by us revealed that the patients who were treated with anthracyclines show significant changes in biochemical and echocardiographic parameters.

Objective

To determine the electrocardiographic changes in breast cancer patients who were treated with anthracycline chemotherapy at the Teaching Hospital, Karapitiya

Methodology

A prospective cohort study was conducted on newly diagnosed breast cancer patients (196) who were administered with anthracycline chemotherapy for the first time. Relevant clinical and demographic data were collected using a questionnaire. Electrocardiography (PR interval, QRS duration and QTc interval) was obtained; one day prior to chemotherapy; one day after the first dose; one day after the last dose and six months after completion of chemotherapy. Ethical approval was obtained from the Faculty of Medicine, University of Ruhuna (23.10.2014:3.10).

Results

A significant difference ($p < 0.001$) was observed in the QRS duration & QTc interval between the baseline values and one day after the first dose, last dose and six months after completion of anthracycline chemotherapy. In the study group, 5.61% of patients had a QRS duration > 120 ms one day after the first dose and 17.86% and 21.43% of patients, respectively one day after last dose and six months after completion of chemotherapy. There were 14.8% of patients one day after the first dose, 30.1% one day after last dose and 31.63% six months after completion of chemotherapy who had QTc interval > 440 MS logistic-regression analysis revealed, age > 60 years (OR: 9.65) and cumulative dose ≥ 350 mg/m² (OR: 3.86) as significant risk factors for occurrence of cardiac failure with reference to QRS duration and cumulative dose > 350 mg/m² (OR: 5.08) as a risk factor with reference to QTc interval.

Conclusion

Consistent with previous results, significant electrocardiographic changes were observed after anthracycline chemotherapy. Therefore, cancer survivors should be regularly monitored to increase their quality of life.

Keywords: anthracycline, cardiotoxicity, electrocardiogram, risk factors

PP-05 Evaluation of computed tomographic volume assessment of human kidneys – a preliminary study

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Background

The renal volume is a valuable parameter to monitor renal function in renal failure. An accurate volume assessment procedure assures the reliability of results, hence improve the utility. However, data is scarce on the accuracy of computed tomographic (CT) renal volume assessment.

Objectives

To evaluate the CT renal volume measurement procedure and to compare the CT volumes with ultrasonically obtained volumes.

Methodology

Non-contrast CT kidney-ureter-bladder (KUB) studies (n=30) were evaluated under standard imaging conditions to obtain linear measurements of the kidney (n=60). Maximum renal length (L), width (W), and thickness (T) were measured using an electronic calliper to the nearest 0.1mm. Two experienced Radiologists obtained measurements independently by repeating each measurement thrice. The renal volume was calculated using the standard “LxWxTx0.5” formula. Inter and intra-observer measurement variability were evaluated. The CT volume was compared with ultrasonically obtained renal volume to evaluate the accuracy.

Results

The mean age (SD) of the study group was 47 (18) years. Right kidney: mean length 8.78 (1.29) cm; mean thickness 6.08 (0.4) cm; mean width 4.72 (0.45)cm; mean volume 254.6 (51.6)cm³. Left kidney mean length 9.43 (0.97)cm; mean thickness 5.09 (0.85)cm; width 5.43 (0.5)cm; mean volume 264.3 (66.6)cm³. CT linear measurement procedure was reliable with high inter-observer (Chronbach's α =0.998) and intra-observer agreements (Chronbach's α =0.998). There was no significant difference between the two measurements obtained by the same investigator (T=0.438; p=0.664). No significant measurement difference was observed between the two investigators (T=0.777; p=0.443). No significant difference between CT and ultrasound renal volume measurements (T=0.805; p=0.466) with a high correlation between two volumes (R=0.996; p<0.001).

Conclusion

This study has proven the accuracy of CT renal volume measurement procedure. The high inter and intra-observer agreements ensure the reliability of results; thus, CT volume assessment can be recommended when sequential renal volume monitoring is required.

Key words: computed tomography; kidneys, linear measurements, validation, volume estimation.

PP-06 A rare case of acute posterior myocardial infarction associated with right bundle branch block

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Background:

Electrocardiogram (ECG) diagnosis of acute myocardial infarction (MI) is challenging when the ischemia is associated with conduction abnormalities. Posterior MI with right bundle branch block (RBBB) is a rare condition where the prognosis is very poor.

Case history:

A 47-year old gentleman arrived to the emergency department (ED) after 30 minutes of central chest pain. He suffered a cardiac arrest after a few minutes of admission and the initial rhythm recorded was ventricular fibrillation. He was resuscitated and an advanced airway was obtained. Spontaneous circulation and breathing achieved after two cycles of cardiopulmonary resuscitation and his 12 lead ECG showed broad R waves with ST depressions in V1 and V2 leads with RBBB. The V7, V8, V9 leads showed more than 0.5 cm ST elevations and the diagnosis of posterior MI with RBBB was made. The patient was initially thrombolysed in the ED since the facilities for primary percutaneous coronary intervention (PCI) was not available and transferred for PCI. Stenting was performed for proximal circumflex artery and right coronary artery. Left anterior descending artery revealed chronic arterial occlusion. Unfortunately, he suffered another cardiac arrest on the 3rd day of PCI and expired.

Discussion:

RBBB results in an intra-ventricular conduction delay either due to physiological or anatomical dysfunction in the right bundle branch. Disrupted posterior circulation results in posterior MI and represents about 15%-21% of all acute MI. When Posterior MI and RBBB co-exist, classic RBBB pattern on ECG gets altered due to superimposition of the early depolarization and repolarization attributable to the presence of posterior MI. It results in excessive discordance of the ST segment in V1 to V2. This could mislead the clinician resulting in delayed reperfusion therapy.

Conclusion:

Though difficult, diagnosis of posterior MI with RBBB could be appreciated in ECG and early primary PCI should be considered in such occasions.

Keywords- cardiac arrest, posterior myocardial infarction, right bundle branch block,

SOP -01 Access to health services and risk factor control during lockdown due to COVID-19 pandemic among patients with chronic diseases attending Teaching Hospital, Karapitiya

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Background: Proper health care and risk factor control are important for successful outcomes in patients with chronic diseases. These patients faced various difficulties in receiving health care during the lockdown due to COVID-19 pandemic.

Objective: This study assessed the access to health services and risk factors control measures adopted during lockdown due to COVID-19 pandemic by patients with chronic diseases attending Teaching Hospital, Karapitiya (THK).

Methods: In a hospital-based, cross-sectional study, a sample of 236 patient attending diabetic, endocrine and three medical clinics of THK was recruited. Data were collected using an interviewer-administered questionnaire and a data extraction form and analyzed using SPSS. Associations were assessed using Chi-Square test.

Results: Majority who utilized health care services during the lockdown were females (58.5%) aged between 60-70 years (40.7%). Diabetes (63%) and hypertension (29.2%) were the commonest chronic diseases for which treatment was sought. A majority (52%) could not consult a doctor; however they obtained their medication from hospital via registered post (15.5%), from government pharmacies (33.3%) and from private pharmacies (26.0%). Lack of transport and economic problems were commonest barriers in accessing health services. Satisfactory adherence to physical activity recommendations was reported by 14%, dietary recommendation by 25.8%, stress management by 18.6% and control of smoking by 11%, indicating poor control of risk factors.

Conclusions and recommendations: A vast majority of patients with chronic disease attending clinics of THK had managed to receive medication during the lockdown period though many of them could not consult a doctor. However, self- management of risk factors was unsatisfactory among them, emphasizing the need for continued awareness during emergency situations, preferably through mass media.

Keywords: access to health care, risk factor control, chronic diseases, COVID 19

SOP -02 Perceived changes in activity patterns among office workers in Matara district during the lockdown/curfew due to Covid-19 pandemic

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Background: Social restrictions imposed during the corona virus pandemic led to changes in lifestyles and behaviors among working population. Understanding the changes in activity patterns during a period of social restrictions is important in developing interventions to optimize population health.

Objective: This study aimed to describe the perceived changes in physical and recreational activities among office workers in Matara district during the lockdown/curfew due to Covid-19 pandemic.

Methods: A cross-sectional survey was conducted among 270 office workers using an online questionnaire. Data were analyzed using SPSS and Chi-square test was used to assess the associations between variables.

Results: Mean age \pm SD of sample was 33.2 \pm 7.9 years and 56% were males. A decrease in activities such as walking (81.5%) and cycling (50.0%) was found during the lockdown/curfew, while no considerable change was reported in activities such as dancing/aerobics (46.3%), Yoga (45.6%), martial art (51.1%) and sports (30-39%). However, an increase of leisure time activities such as gardening (81.5%), cookery (63.0%), watching TV (84.8%), aesthetic activities (72.2%) and indoor games (46.7%) was reported. Unhealthy changes in physical activities was significantly associated with male gender ($p=0.03$) and lower educational status ($p=0.02$), but not with the area of residence, job category, income category or working time during lockdown ($p>0.05$). Unhealthy changes in recreational activities were significantly more common among males ($p=0.002$) and those reporting higher than normal working times ($p<0.001$), though not associated with other study variables ($p>0.05$).

Conclusions and recommendations: There were considerable changes in activity patterns among office workers in Matara district during the Covid-19 lockdown. Health education interventions are recommended to sustain the healthy activity patterns and to promote adoption of healthy behavioral changes in high risk groups.

Keywords: physical activity, recreational activity, Covid-19, office workers, Matara

SOP -03 Effects of University closure on academic activities of medical students of University of Ruhuna during Covid 19 global pandemic

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Background: Covid 19 pandemic forced universities in Sri Lanka to close indefinitely and moved educational activities on to online platforms. Understanding the impact of this change on academic activities could be beneficial in improving the online teaching-learning experience.

Objective: This study aimed to assess the effects of university closure on academic activities of medical students of University of Ruhuna during Covid 19 global pandemic.

Methods: A descriptive, cross-sectional study was conducted among a convenient sample of 427 undergraduates, selected from pre-clinical, clinical and para-clinical batches of the Faculty of Medicine, University of Ruhuna. A self-administered questionnaire in the form of a Google doc was used to collect data. Data analysis was done using SPSS. Associations between variables were assessed using Chi-square test. Level of significance was considered as 0.05.

Results: A majority of students (65.6%) have changed their study pattern during the pandemic and 56.2% had experienced deterioration of their academic activities due to change in study place. Tendency of changing study pattern was higher in senior batches compared to junior batches and in males compared to females ($p < 0.001$ and $p < 0.05$ respectively).

All the students had at least one device to access online education. Majority (86.9%) had smart phones and 78.9% has 4G signal type at their residences. Of the sample, 3.5% did not have satisfactory IT knowledge to carry out their online education and a similar proportion did not have satisfactory signal strength at their residences.

Majority have changed their study materials to printouts of lecture notes uploaded to Learning Management System (LMS) (67.7%) and PDF (91.8%). Approximately 58% discussed with friends via Zoom/WhatsApp/ other messaging apps. Difficulties in logging into LMS (50.9%) and frequent interruptions in internet connection (58.3%) were identified as common barriers for successful online learning. However, only 14.7% students were not satisfied with online learning. Approximately 76.1% preferred to continue online lectures after the reopening of universities, whereas 55.7% and 68.6% preferred to have online practicals and tutorials after re-opening.

Conclusions and recommendations: A majority of the medical students have experienced deterioration of their academic activities during Covid 19 global pandemic due to changing their study pattern and study place. Online lectures, tutorials and practicals were well accepted by the medical students and the use of online teaching methods through LMS is recommended in future as well.

Keywords: effects, university closure, academic activities, medical undergraduates, Covid 19

SOP -04 Awareness, attitudes and preparedness of the employees towards the operational guidelines issued for the reopening of salons in selected areas of Galle District during the COVID-19 pandemic

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Background: Beauty industry being a service with close physical contact, paves way for rapid infection spread. Therefore the Ministry of Health has issued operational guidelines for the reopening of salons after the lockdown period.

Objective: This study aimed to assess the awareness, attitude and preparedness related to the operational guidelines imposed for the post lockdown period of COVID-19 pandemic among employees in the beauty parlors and salons in selected areas of Galle district.

Methods: This descriptive cross-sectional study with convenient sampling was conducted among 301 employees in beauty parlors and saloons in selected areas of Galle district. A Google form based on operational guidelines was used with a predesigned scoring system based on the responses. Data were analyzed using SPSS version 20.0 and $p < 0.05$ was considered as the level of significance.

Results: Median age (IQR) of 301 salon employees was 29 years and 47.2% have been educated up to GCE A/L. Most of them (89.4%) were aware about the operational guidelines. Majority (98.3%) have reported that the operational guidelines are mandatory for reopening. Among the practices, 100% of the respondents wore face masks and washed hands with soap and water. Between each client 72% used hand sanitizers. Majority (52%) used an appointment system to minimize clients. Only 30% wore face shields and 18% checked the temperature of clients before entering the workplace, which was quite unsatisfactory and 53.7% expressed that physical distancing within the salon premises is not sufficient. There was no statistically significant association between, educational level and awareness on transmission of infection, attitude on operational guidelines and preparedness, awareness on operational guideline and preparedness.

Conclusions and recommendations: Although awareness and attitude towards the guidelines were satisfactory, the preparedness for implementation of the guidelines by the employees was quite unsatisfactory. Therefore it is compulsory to uplift the knowledge of the employees pertaining practices related to the operational guidelines and strict routine inspection by relevant authorities and institutions is required.

Keywords: COVID-19, operational guideline, saloon employees, awareness, attitude and practices

SOP -05 Psychosocial impact of COVID-19 pandemic on Traffic Police Officers in Galle division

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Background: The duties and responsibilities of traffic police officers have noticeably become different during the COVID-19 pandemic. Although not trained in disease control and prevention activities as health care workers, they are more prone for social and psychological issues during engagement of pandemic control activities.

Objective: This study aimed to assess the psychosocial impact of the pandemic on traffic police officers in Galle division.

Methods: A cross-sectional study was conducted recruiting officers from 16 police stations in Galle District adopting consecutive convenient sampling. Data on social problems in relation to work place, neighborhood and public were assessed using a self-administered, predesigned questionnaire. Validated Sinhala version of “Kessler Psychological Distress Scale” questionnaire was used to assess psychological status.

Results: Of 165 traffic officers, 69.3% responded. Among 111 respondents, 81.1% were male and the median age (IQR) was 48 (38–52) years. Psychological distress was observed in 53 (47.7%). Further 29 (26.1%) were severely distressed and 3 (2.7%) had visited a psychiatrist seeking help. Significant social problems were reported in 34.2% which included loss of supportiveness and cooperativeness, social stigma, rejection of social affairs, conflicts and poor satisfaction at work. A significant associations were observed among female officers with increased psychological distress ($p < 0.05$) and among younger officers with the experience of increase social problems ($p < 0.05$).

Conclusions and recommendations: Psychological distress was common among traffic police officers in the Galle district and higher psychological distress was observed in female officers. Necessary policies should be developed and implemented for psychological support for non-health care workers involved in pandemic control.

Keywords: psychosocial, traffic police officers, Kessler scale, Sri Lanka

SOP -06 Psychological well-being among Nursing Officers working in Teaching Hospital Karapitiya during COVID 19 pandemic in Sri Lanka

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Background: Health care workers have been fighting against the COVID 19 pandemic in the forefront and nursing officers play an integral part of the front line during this pandemic in Sri Lanka.

Objective: This study was conducted to assess psychological well-being among Nursing Officers working in Teaching Hospital Karapitiya (THK) during COVID 19 pandemic in Sri Lanka.

Methods: A cross-sectional study was conducted among 228 nursing officers in THK selected using stratified sampling, who work in five different units (medical, COVID, outpatient, emergency treatment and infection control units), with a high risk for COVID 19 exposure. A self-administered questionnaire was used for data collection. Sinhala versions of Patient Health Questionnaire-9 (PHQ9) for depression and Zung Self rating anxiety scale (SAS) for anxiety were used following judgemental validation to assess prevalence of depression and anxiety. Chi square test was used to assess the factors associated with psychological well-being at 0.05 significance level.

Results: Majority of the sample was female (96.1%) with mean age (SD) of 38.8 (6.8) years. A high level of stress (78.9%), being annoyed and irritable than usual (60.5%) and difficulty in concentrating at work (40.8%) were reported as common psychological issues. A considerable proportion had mild depression (15.8%) followed by moderate depression (2.6%) with zero prevalence of severe depression. Interestingly, prevalence of anxiety was zero among the sample based on SAS scale. Considering the overall mental health and wellbeing, 47.3% has rated their mental health and well-being as good or very good while the remaining 52.7% had rated as either bad, very bad, neither good nor bad or I don't know. Nursing officers who had consecutive shift duties, inadequate personal protective equipment, feeling of inadequate support from hospital, fear of spreading the disease to loved ones and social denial due to being labelled as risk health care workers for COVID 19 were more likely to have poor psychological wellbeing ($p < 0.05$ for all).

Conclusions and recommendations: Psychological wellbeing of nursing officers has been affected due to current COVID 19 pandemic. Necessity of tailored interventions to improve mental health of nurses is recommended during pandemic situations.

Keyword: psychological wellbeing, COVID 19, Nursing Officers, depression, anxiety

SPP-01 Experience, perception and difficulties faced in online teaching by university academics of Faculties of Ruhuna University situated in Galle

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Background: With the lockdown due to COVID19 pandemic, the novel educational system from elementary to tertiary level has been collapsed. This in turn transformed formal education into online education. Due to this rapid unplanned and unprecedented move towards virtual education, many challenges have arisen.

Objective:

This study is aimed to investigate the experiences, perception, and difficulties faced by academics of the University of Ruhuna.

Methods: A descriptive cross-sectional study was conducted in Medicine, Engineering and Allied Health Science faculties of the University of Ruhuna. Data was collected using a Google form questionnaire.

Results: Out of 100 responses, a majority of academics (91%) have not done online teaching before this pandemic. Thirty three percent had received guidance about online teaching. Majority (57%) have done online teaching multiple times per week. Percentage of academics who had perceived that they were unable to know whether students follow lectures properly in faculty of Medicine, Engineering and Allied-Health respectively is 18%, 28.9% and 45.8%. Satisfaction about content coverage and delivery of knowledge to students in online teaching is comparatively higher in faculty of Engineering. While 52% academics are satisfied about online teaching, one third of the academics (32%) had Internet accessibility problems. A majority (53%) could not conduct practical and tutorials via online methods and 72% were unsatisfied with online teacher student relationship.

Conclusion and recommendations: One third of academics (32%) had Internet accessibility problems, therefore we recommend to improve facilities for internet access. As majority couldn't conduct practical and tutorials via online methods, we recommend to organize a training on interactive online teaching/learning methods which improve teacher student interactions.

Keywords: online, teaching, experience, perception, difficulties

SPP-02 Socioeconomic & lifestyle changes on families of medical students of University of Ruhuna during lockdown period due to COVID-19 pandemic

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Background: Sri Lanka was locked down from 20.03.2020 to 11.05.2020 due to COVID 19 pandemic.

Objective: This study was carried out to get an overview of socio-economic impact and lifestyle changes during lockdown period due to COVID 19 pandemic.

Methods: A cross-sectional study was conducted targeting medical students of University of Ruhuna and their family members between January-March 2021. Data regarding socioeconomic and lifestyle changes of their families was collected via Google forms from 400 medical students.

Results: During lockdown period, monthly income has increased only in one family (0.25%), than the income before the lockdown and in 116 families (29%) monthly income has decreased during the lockdown period. No significant income change occurred in 283 families (70.75%). Twenty four percent of sample had no psychological issues and 70% had some difficulty in handling the situation (including psychological issues such as considerable degree of fear, worry and concern in the family, stress and anxiety, social isolation, increased loneliness, sleeping disturbances). It was very difficult for 5% of them and 1% found it extremely difficult.

Regarding education, 28.5% had lack of devices for online education, 49.3% had internet connection disruptions and 50.2% faced disturbances while studying away from usual places. When consider the health of the families, 7.2% postponed their surgeries and 21.5% cancelled their investigations due to the lockdown. In 24.3%, reduced income has affected in buying medicines. In 42.5%, pharmacy closure has affected in buying medicines. Forty eight percent postponed their planned cultural or social functions due to lockdown.

Conclusions and recommendations: Majority of families (71%) had stable economy however large majority (76%) of participants had psychological issues. Recommend to organize special programmes to uplift the mental status of general population before, during and after a lockdown period.

Keywords: lockdown, economy, psychological impact, education, impact on health

SPP-03 Perception of usefulness and problems of online teaching and learning methods during Covid-19 pandemic among Grade 12 and 13 students in “Gateway” Education Institute, Galle

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Background: The COVID-19 pandemic has affected the education of the students globally, leading to a near total closure of schools. This intern has caused a shift of teaching and learning methods from the traditional onsite teaching to more modern online teaching and learning methods which were not routinely practiced in the Sri Lankan setting.

Objectiv: The objective of this study was to describe the perception of usefulness and problems of online teaching and learning methods among the grade 12 and 13 students of Galle during COVID 19 pandemic from 1st of April 2020 to 31st of June 2020.

Methods: A cross-sectional study was conducted among 337 grade 12 and 13 students hoping to sit for the advanced level examination in 2021 who attend classes at the in Gateway education institute in Galle. Information were obtained through a self-administered questionnaire and the data were analyzed by the SPSS software (version 25.0). Associations were assessed using Chi-Square test.

Results: Majority of participants were females (n=232, 68.9%). The Highest proportion of participants were belonged to social class II (52.8%). The majority of the students in the sample used their own mobile phone (63.8%) to join the teaching sessions. The majority preferred teaching through the zoom platform (94.3%) over Google classroom, YouTube and WhatsApp.

Participation for online classes was satisfactory with almost all students (99%) joining the sessions regularly. Common reasons for missing classes were poor internet connection (25.5%) and disturbance at the home environment (24%). Students who were participating via zoom stated their ability to concentrate more on lessons (p=0.021).

Online teaching and learning was more useful for students who had a better perception on usefulness (p=0.001), students of the families with a higher income (p=0.037) and students who had uninterrupted internet connection (p=0.008). The ability of the students to understand the lessons was reported to be higher when a blackboard was used (p=0.005) and when opportunities given to ask questions (p=0.0001). The majority of the students (59%) preferred the traditional ways of teaching over the online teaching and believed traditional teaching is more effective.

Conclusion and recommendation: The acceptance and satisfaction on online teaching and learning methods among the grade 12 and 13 students of Galle are low. However, provision of the required facilities to the students would increase the acceptance and usefulness of online teaching and learning methods.

Keywords: COVID-19, Galle, online teaching and learning methods, students, studies, perception, usefulness

SPP-04 Impact of the COVID -19 pandemic on the role played by the Public Health Midwives in the Expanded Programme of Immunization in Galle district

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Background : The duty of the Public Health Midwife (PHM) is compromised significantly due to the prevailing COVID 19 pandemic in Sri Lanka. As PHMs play a major role in the Expanded Programme of Immunization (EPI)

Objectiv: The main objectives of this study are to assess the knowledge and practice of PHMs regarding the COVID 19 pandemic, an, the impact of COVID 19 pandemic on the role played by PHMs on EPI in Galle district.

Methods: A cross-sectional study was conducted among PHMs of ten selected MOH areas using convenient sampling. A Self-administrated questionnaire was used to get information regarding age appropriate immunization during the lockdown period from the participants, and the data were analyzed using Statistical Package for the Social Sciences (SPSS).

Results: The majority of PHMs have a satisfactory knowledge of COVID 19 with a percentage of 51.2 (n=164). The study showed that 75% of PHMs have adequate knowledge of facing a pandemic (n=164). The majority of (97.6%) responses of PHMs (n=161) showed that; there was an interruption to the EPI. According to the study, the provision of all vaccines were interrupted during the lockdown period. The major reasons for interruption were poor attendance of the people (30.5%), and the precautions taken by the government during the pandemic (90.9%). Akmeemana, Habaraduwa and Yakkalamulla MOH areas had the poorest vaccination coverage during this time period while Municipal Council Galle had the highest vaccination coverage.

The study shows a statistical significance of knowledge on COVID 19 with the awareness programmes conducted for the PHMs ($p < 0.05$). There is satisfactory knowledge on using PPEs in PHMs whose duration of service is equal to or less than 20 years. ($p < 0.05$)

Conclusion: There was a significant interruption to EPI, and the duration of interruption is significant with 1-2 months.

Keywords: COVID 19, Public Health Midwife, Expanded Programme on Immunization.

SPP-05 Evaluation of infections control measures adopted by Dental Surgeons in Sri Lanka during COVID 19 pandemic

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Background: Transmission of SARS-COV-2 virus occurs through respiratory route; therefore dental surgeons are at a high risk of exposure as they work in close proximity to the patient's oral cavity and engage in aerosol generating procedures. This study aimed to assess the infection control measures against COVID 19 pandemic adopted by the Dental Surgeons in Sri Lanka.

Methods: In a cross-sectional study, a convenient sample of 156 dental surgeons registered in Sri Lanka Medical Association were recruited. Data were collected using an online survey (response rate was 40.6%) and analysed using SPSS. A scoring system was used to assess the level of adherence to infection control guidelines. Chi-square test and Z test were used in assessing association between variables.

Results: Majority of the sample were females (n=85, 54.5%) in the 25-34 years age range (37.8%) while 30% of the participants had a service duration less than 5 years, 25% had postgraduate qualifications and 68.6% worked as general dental surgeons. Approximately 98% were vaccinated against COVID-19. Compared to pre-pandemic period, 99.3%, 83.9% and 85.2% claimed that there is an increase in the frequency of hand washing, changing gloves and changing surgical masks respectively during COVID-19 pandemic. Nearly 89% disinfected dental chair after each patients, whereas only 10.3% did so before the pandemic. Majority (n=133, 85.2%) reported satisfactory adherence to infection control guidelines.

Time taken for the procedures (80.8%) and cost (72.4%) were the commonest barriers observed in adhering to guidelines. Dental surgeons working in private hospitals (n=9, 5.8%) used significantly more Personal Protective Equipment compared to those in government hospitals (p=0.009). A statistically significant association was observed between longer work experience with more satisfactory adherence to guidelines (p=0.007)

Conclusion and recommendations: Majority of the dental surgeons reported satisfactory adherence to infection control guidelines against COVID-19. Government and public organizations must intervene financially and psychologically to support the dentists during these unprecedented times.

Keywords: COVID 19, infection control, personal protective equipment, dental surgeons, Sri Lanka

SPP-06 Online teaching experience among teachers of national schools in Galle educational division during COVID-19 pandemic

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Background: During COVID 19 pandemic, on-site teaching methods were interrupted and teachers had to switch to online teaching to continue education of the children. This made teachers to face many problems and it is necessary to identify them to improve teaching as the world is shifting towards this new technology. This study aimed to describe the experience of online teaching among teachers working in national schools of Galle educational division.

Methods: A cross-sectional study was done in a sample of 323 teachers from selected 9 national schools of Galle educational division. Data were collected via a self-administrative questionnaire.

Results: There were 323 respondents (78% females) in the age between 23-59 years. A majority (89%) used zoom for online teaching. Many of the teachers complained of having inadequate internet facilities (52%) and computer skills (35%). Also they had poor environment for teaching (51%) and had frequent distractions (65%). Importantly, 85% of them were unsatisfied as they had no direct contact with students. Problems experienced showed significant association with gender and age ($p < 0.05$).

Conclusions and recommendations: This study shows that it is necessary to improve internet facilities and computer skills among teachers to continue with online education. Further, student direct contact should be improved technologically to improve teachers' satisfaction on teaching.

Keywords: online teaching, teachers, COVID-19, Galle educational division

SPP-07 Prevention of COVID-19 Infection: Ward preparedness by Nursing Officer in-charge in Teaching and Base Hospitals in Galle district

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Background: During the COVID-19 pandemic, hospitals operate at their full capacity with limited resources to cater for the rapidly increasing demand for service. In this situation, tight measures should be taken to limit the nosocomial spread of the virus to protect patients, visitors and health care workers. This study aimed to describe the ward preparedness in preventing COVID-19 infection spread by assessing knowledge, protective measures taken and problems encountered by the nursing officer in-charge of the wards.

Methods: A descriptive cross-sectional study was conducted in two Teaching Hospitals and three Base Hospitals in the Galle district. Out of 100 wards in these hospitals, 79 were selected conveniently, and in charge nurses of those wards completed a self-administered questionnaire.

Results: There were 79 in-charge nursing officers (86.1% females), 56 were from two Teaching Hospitals and 23 were from Base Hospitals. The mean age of the sample was 45.8 years. Knowledge on COVID disease was 92% and adherence to protective measures was 96%. They have reported a shortage of regular supply of Personal Protective Equipment (PPE) and insufficient space to maintain proper hygienic practices. Neither knowledge nor adherence to usage of PPE was associated with the in-charge nurse's gender, work experience, or hospital type.

Conclusions and recommendations: Nursing officers had good knowledge and they have adhered to optimal preventive measures to prevent COVID-19 diseases spread in wards even with the shortage of PPE. The regular supply of all different types of protective equipment should be ensured to further improve the condition.

Keywords: prevention, COVID-19, ward preparedness, Nursing Officers in-charge, Teaching and Base Hospitals

SPP-08 Preventive measures and occupational stress among Ambulance personnel in Galle district during COVID-19 pandemic

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Background: Ambulance workers are front liners and their service is necessary in managing this COVID-19 pandemic. They are at high risk of catching the disease and therefore under mental pressure in providing their service. This study is designed to investigate their adherence to preventive measures and their psychological wellbeing.

Methods: A descriptive cross-sectional study was conducted on all government Ambulance workers in Galle district. Phone interviews were conducted and questioned regarding their awareness and usage of preventive measures. Occupational stress was measured by Kessler psychological scale.

Results: There were 102 participants, all males with a mean age of 44 years. Knowledge and adherence to preventive measures on COVID-19 disease were 99%. Adherence to good infection control practices was 89%. The mean occupational stress of the workers was of 15.04 (SD=5.056), and 12% had moderate to severe occupational stress. Occupational stress was significantly associated with knowledge on prevention ($p=0.006$) and having elders at home ($p=0.001$). However, it was not associated with having children at home ($p=0.967$).

Conclusion and recommendations: Ambulance workers have adequate knowledge about the disease and preventive measures, and have satisfactory usage of infection control practices. However, a considerable number of ambulance workers are working under moderate to severe level of occupational stress. This cannot be overlooked and recommend health interventions to improve their psychological wellbeing.

Keywords: COVID-19, preventive measures, occupational stress, ambulance workers, Galle

SPP-09 Impact of COVID-19 pandemic on pharmaceutical sales at main outlets of State Pharmaceuticals Corporation in Galle district

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Background: During COVID-19 pandemic State Pharmaceuticals Corporation (SPC) was the main supplier of pharmaceuticals to all health institutions under Ministry of Health in Sri Lanka. Although identification the pattern of pharmaceutical sales during a pandemic will be helpful to maintain a continuous supply of medications for patient care data on this aspect is sparse. This study aimed to assess the impact of COVID-19 pandemic on pharmaceutical sales at main outlets of State Pharmaceuticals Corporation in Galle district.

Methods: A descriptive cross-sectional study was conducted using the records of pharmaceutical sales from Karapitiya and Galle SPC outlets. Pharmaceutical product list was obtained from the official SPC website. Data on pharmaceutical sales from March to May for both year 2019 and 2020 was extracted from SPC database. Sales on antibiotics, analgesics, antihistamines, corticosteroids, NSAIDs, disinfectants, gastrointestinal medications, endocrine medications, medicines act on the nervous system and drugs use for cardiovascular diseases, respiratory diseases were included while medical devices and equipment were excluded. Independent sample t test was used for statistical analysis and p value of less than 0.05 was considered as significant.

Results: Out of 471 products, 300 were enlisted under 21 categories. During March to May 2020 the highest percentage sale was recorded for disinfectants (14.81 %), followed by analgesics (8.3 %) and antibiotics (4.98 %) while the lowest number of sales was observed in antihistamines (1.47%) followed by NSAIDs (2.32%) and corticosteroids (2.56%). During the period there was a decrease in overall sales despite percentage increase noted for disinfectant (5.54%) and NSAIDs (1.33%). However, in comparison to respective period in 2019, in 2020 the average sales had increased by 10.1% with increment of sales in disinfectants (10.78%), corticosteroids (3.87%), vasodilators (1.98%) and bronchodilators (1.4%) while, antibiotics were decreased by 4.86%. No association was observed between pharmaceutical sales during COVID-19 pandemic with shelf life or dosage forms ($p>0.05$).

Conclusion and recommendation: The overall pharmaceutical sales during selected months COVID-19 pandemic was higher than the respective months of previous year with marked increment of sales for disinfectants. Sufficient stocks should be maintained in drug categories which showed a significant in 2020 with comparing to 2019.

Keywords: pharmaceutical sales, COVID-19 pandemic, State Pharmaceuticals Corporation, Galle district

SPP-10 Experience and perception on COVID control activities of Public Health Inspectors in Galle district during COVID-19 pandemic

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Background: Public Health Inspector (PHI) is a crucial member of primary health care system and the importance of his duties had become greater than before with the COVID-19 pandemic. As frontline health care workers PHIs directly and frequently interacting with the community in prevention and control activities. The objective of the study was to evaluate the experience and perception on COVID control activities of Public Health Inspectors in Galle district during COVID-19 pandemic.

Methods: A descriptive cross-sectional study was conducted among the PHIs attached to 20 MOH areas in Galle District using consecutive convenient sampling method. Data on the level of engagement in COVID-19 control activities, overall public compliance, adequacy of PPE and work satisfaction were collected using a self-administered questionnaire and assessed by a pre-designed scoring system.

Results: Of 113 PHIs 85% responded. Among 96 respondents, the median age (IQR) was 41 (31-48) years. The majority were engaged in quarantine of suspects (99%) followed by inspection of social events (88.8 %). Most PHIs (75%) were in the category of “highly engaged in COVID-19 control activities”. Internet was their main source to obtain information (88.5%) related to COVID-19. The public compliance was perceived as average by 58.3% of PHIs. Personal protective equipment (PPE) were reported to be highly adequate by 79.2%. Most of the PHIs were highly satisfied with overall cooperation available during pandemic (74%) and administrative authority they had for COVID-19 control activities (52.1%). A significant association was observed between highly engaged group in COVID-19 control activities and both adequacy of PPE ($p<0.05$) and the level of satisfaction towards overall cooperation available ($p<0.05$)

Conclusions & recommendations: Engagement of the PHIs in the COVID-19 control activities was high and had received adequate PPE. However, their perception on public compliance was average. Higher level of satisfaction by PHIs was observed with regard to overall cooperation and the administrative authority to engage in COVID-19 control activities.

Key words: experience, perception, PHI, COVID-19 pandemic

SPP-11 Use of hand sanitizers in clinical practice and associated skin related adverse effects reported by general practitioners in Galle district during the COVID-19 pandemic

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Background: Hand sanitizers are the popular modality to maintain hand hygiene in health care settings worldwide due to the efficacy and convenience in preventing cross transmission of diseases. Studies show a higher prevalence of skin related adverse effects among health care workers (HCW) compared to other occupational groups attributed to their higher exposure to hand sanitizers. Since the usage of hand sanitizers has greatly increased with the onset of the COVID-19 pandemic, assessment of its use and related adverse effects on skin among HCW is important.

Objective: Objective of the study was to describe the use of hand sanitizers and associated skin related adverse effects among general practitioners in Galle district.

Methods: A cross-sectional study was conducted among 54 general practitioners registered in the General Medical Practitioners' Association in Galle district using convenient sampling. Data on type and frequency of sanitizer used, and self-reported skin related adverse effects experienced by the respondents were obtained using an online survey form. Exposure to sanitizers was assessed based on a pre-designed scoring system. Data was analyzed using Statistical Package for the Social Sciences (SPSS).

Results: Alcohol based sanitizer was the most popular type (92.6%). High exposure to sanitizers was observed among 14.8% of respondents. Self-reported adverse effects on skin were found in 12.9%. The commonest symptom experienced was the dryness of skin (71.4%). Only 3.7% had used skin care products following use of sanitizer. A significant association was found between the development of skin related adverse effects and both level of exposure to sanitizers and past history of atopic skin diseases ($p < 0.05$).

Conclusions and recommendations: Alcohol based sanitizers were commonly used and the high exposure to sanitizers and past history of skin diseases were associated with skin related adverse effects among general practitioners in Galle district. Measures must be implemented at institutional and individual levels to minimize unnecessary exposure and related skin adverse effects by sanitizers in the health care setting.

Keywords: sanitizers, skin related adverse effects, General Practitioners, COVID-19

SPP-12 Changes in household food consumption patterns among residents of selected districts during COVID-19 pandemic

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Background: Risk perception associated with COVID-19 may influence people's food purchase and consumption behaviors.

Objective: The objective of the study was to describe and compare the changes in food consumption patterns and associated factors during COVID-19 pandemic among the housewives of selected districts.

Methods: A community based descriptive cross-sectional study was carried out based on an interviewer administered questionnaire. The study was conducted among households in the districts, which were under intermittent and continuous lockdown, selected considering the feasibility under the prevailing situation, namely; Gampaha, Kurunegala, Galle, Puttalam, Anuradhapura and Kegalle. A convenient sample of 427 housewives was recruited according to inclusion and exclusion criteria. The Chi-square test was used to detect associations between variables. The collected data was entered and analyzed using SPSS software (V.20.0)

Results: Majority was Sinhalese and this leads to consumption of rice as the staple food regardless of the COVID-19 situation. Vegetables were frequently consumed (80%). Bread and other starchy food consumption markedly reduced (Prior to COVID-19=57, During COVID-19=118). Fruit consumption was frequent in Anuradhapura district (58%). Consumption of sugary beverages, fast food and short eats was reduced during the lockdown period (Prior to COVID-19=63, During COVID-19=36). Considerable change in the food consumption pattern before and during the COVID-19 lockdown (46%) was resulted. 90.3% of the sample did not skip any meals. There was no association of income or educational level with the change of consumption pattern during COVID-19 lockdown (Income; $p=0.556$, Education; $p=0.646$). In the sample 60% of the families had difficulties in accessing food. There was no association between difficulties in access to food and using of delivery services during COVID-19 (CI-95%, $p=0.05$). Half of the sample has practiced specific food behaviors.

Conclusions & recommendations: Changes in food consumption patterns can affect health and nutrition of people. So it is important that the government consider the need for organized campaigns, workshops and education programs to teach them about healthy and nutritional food behaviors. Still COVID-19 pandemic is going on and these results need to be confirmed with further studies among a larger population that also include people with confirmed COVID-19.

Keywords: food pattern, COVID 19 pandemic, consumption, lockdown

SPP-13 Preventive measures practiced by doctors in Teaching Hospital Karapitiya against COVID-19 during the COVID-19 pandemic

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Background: The novel coronavirus disease 2019 (COVID-19) became one of the most widespread pandemics in human history and triggered abrupt challenges for healthcare providers. Since, no effective drug therapy has been approved to treat the disease, prevention of the disease transmission became imperative.

Objective: The aim of the study was to describe the preventive-measures practiced by doctors of Teaching Hospital Karapitiya (THK) against COVID-19, during COVID-19 pandemic and the factors associated with such practices.

Methods: A hospital-based, cross-sectional study was carried out recruiting 422 doctors attached to THK during the pandemic. Data on the socio-demographic characteristics and preventive measures practiced at the hospital and the residence were obtained through a self-administered questionnaire. Data were analyzed using SPSS version 20.0. Frequencies, proportions were used to describe the descriptive statistics and chi-square test was used to detect the associations between the dependent and independent variables. The level of significance was considered as $p < 0.05$. The satisfactory level of practice of preventive measures was assessed using a cut-off level of 75% of the total score.

Results: The response rate was 90%. Hundred and ninety (49.5%) were males. Majority (220, 57.3%) were medical officers. The adherence to basic preventive-measures during healthcare interactions with patients were satisfactory ($n=361$, 94%). Satisfactory practices were noted in hand-washing while engaging in aerosol-generating procedures ($n=281$, 93%), treating suspected patients ($n=165$, 92%). Usage of personal protective equipment (PPE) while treating a confirmed/suspected case and while engaging in aerosol-generating procedure were 92% ($n=164$) and 82% ($n=242$) respectively. The unit attached to was associated with the practice of preventive measures at the residence ($p=0.036$) and the best-practice of infection prevention was observed in doctors attached to medical wards. The designation of the doctors was associated with hand-washing while treating patients ($p=0.009$), hand-washing during aerosol-generating procedures ($p=0.015$) and wearing PPE ($p=0.005$) during aerosol-generating procedures.

Conclusion: Majority of the doctors working in THK had satisfactory adherence to preventive-measures against COVID-19 during work and at residence. However, such practices should be further enhanced irrespective of the unit they are attached to.

Keywords: COVID-19, preventive measures, doctors, Teaching Hospital Karapitiya

SPP-14 Knowledge, attitudes and practices towards infection prevention among the community of Bope-Poddala Divisional Secretariat amid coronavirus disease pandemic

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Background: By emerging as a global pandemic, the novel coronavirus enormously affects the daily routine of the mankind. To break the chain of infection, practicing infection safety precautions in a way appropriate would be the finest thing to be done by the community.

Objective: This study was carried out to assess knowledge, attitudes and practices towards infection safety precautions practiced by the community of Bope-Poddala Divisional Secretariat area during the COVID-19 pandemic.

Methods: A community-based, cross-sectional study was carried out recruiting 427 residents of Bope-Poddala Divisional Secretariat Area, selected conveniently out of the ten randomly selected Grama-Niladhari divisions. Data were collected using an interviewer administered questionnaire. The total scores on knowledge, practices and attitudes were calculated and converted into percentages. A score $\geq 75\%$ was considered satisfactory.

Results: The majority 264 (61.8%) were females. The mean age was 40.2 (SD= ± 11.9) years. Only 41.7% (n=178) participants had adequate knowledge on infection safety precautions and mass-media was the major source of information. Majority (n=390, 91.3%) showed satisfactory infection prevention practices. Almost all the participants (97.9%) showed a positive attitude.

A better knowledge was associated with gender ($X^2=8.06$, $p<0.05$), educational level ($X^2=8.12$, $p<0.005$) and occupational level ($X^2=16.20$, $p<0.005$). A better practice of infection safety precautions was associated with the educational level ($X^2=31.64$, $p=0.000$). A satisfactory attitude was associated with gender ($X^2=5.67$, $p<0.05$), age ($X^2=5.01$, $p<0.05$), educational level ($X^2=7.08$, $p<0.05$) and occupational status ($X^2=9.46$, $p<0.05$). Participants with a better educational level had worn masks adequately ($X^2=29.784$, $p<0.05$). Females have practiced hand hygiene ($X^2=16.024$, $p<0.05$) and respiratory etiquette ($X^2=23.686$, $p<0.05$) adequately.

Conclusions and recommendations: There is an inadequacy on knowledge on infection safety precautions among the community with a positive attitude. However, still there is a space for improvement of knowledge and adherence to preventive measure as we need 100% adherence to hygienic practices to control and eliminate this disease.

Keywords: COVID 19, safety precautions, infection control, Bope-Poddala

SPP-15 Awareness and practices of using face masks among patients attending medical clinics at Teaching Hospital Karapitiya (THK) during COVID-19 pandemic

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Background: The use of face masks in public is an important health measure and new normal after COVID-19 pandemic. As the literature found that the patients with comorbidities are having a high risk of getting fatal complications of COVID-19, it is very important for them to adhere to proper usage of face masks. This study was conducted aim to assess the awareness, practices and associated factors of using face masks among patients attending medical clinics at THK during COVID-19 pandemic.

Objective: This study aimed to describe the awareness and practices and associated factors of using face masks among patients attending medical clinics at Teaching Hospital, Karapitiya during COVID-19 pandemic.

Methods: A cross-sectional study was conducted among patients (n=422) attending medical clinics at THK. Systematic sampling was used to select the study participants. An interviewer administered questionnaire with a pre designed scoring system to assess the level of the awareness and practices by giving +1 and 0 for each positive and negative responses respectively.

Results: The majority of respondent were female patients (55%) and 73% of them were above the age of 50 years. A majority (81.3%) had a good level awareness and good practices (89.1%) in wearing face masks. Meanwhile there was a significant association of the awareness with age category and the educational level with a better awareness in below 50 age category (p=0.024) and above O/L category (p=0.008). When considering the practice, majority were using surgical face masks (86.3%) a significant association was only found with, educational category with better practicing methods among above O/L category.

Conclusions: The patients attending medical clinics are having a good level of awareness and overall good practices about using face masks.

Keywords: COVID-19 pandemic, face masks, awareness and practices, patients

SPP-16 Assessment of care received by the pregnant mothers attending the antenatal clinics of Teaching Hospital, Mahamodara during COVID-19 pandemic

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Background: Proper antenatal care is an integral part of maternity outcomes. Recent COVID-19 pandemic critically influenced delivery of health care services including antenatal care in Sri Lanka.

Objective: This study was conducted to assess the antenatal care received by the pregnant women attending the antenatal clinics of Teaching Hospital, Mahamodara (THM) during COVID-19 pandemic.

Methods: A cross-sectional study was conducted among 427 pregnant women attending the antenatal clinics at THM who were selected via a systematic sampling method. Pregnant women who got pregnant from 15th March to 15th May were included for the study. Data were collected using an interviewer assisted self-administered questionnaire. Associated factors for antenatal care and services received during pandemic were calculated using chi-square test at 0.05 significance level.

Results: Majority were multigravida mothers (64.1%) and educated up to O/L (57.2%). Mean (SD) age of the sample was 29.1 (5.5) years. Majority (74.9%) had registered by Public Health Midwives before 8th week of period of gestation and 93.4% of the sample had attended to antenatal clinics during COVID-19 period with high coverage (95.1%) of basic investigations. However, 29.1% had missed one or more clinics during the pandemic. Nearly 59% were satisfied with received antenatal care. Majority (73.5%) had concern with attending antenatal care due to social gathering while 39.1% were preferred for alternative manner for clinic attendance. Majority (74.3%) of the sample who prefer to attend the clinics were satisfied with the existing hygienic safety and precautions in the clinic set up. There was no significant association between receipt of antenatal care and the educational level, income or parity of the mothers. Preference about gathering in clinics with hygienic safety and precaution ($p < 0.001$) and preference about gathering in clinics with alternative method ($p < 0.05$) showed a statistically significant association.

Conclusions and recommendations: Significant disruption has not occurred to the antenatal care services during recent COVID-19 pandemic, but introduction of alternative service like mobile clinic at homes or telehealth will be beneficial to ensure better and safe antenatal care in pandemic situations.

Keywords: COVID-19 pandemic, antenatal care, pregnant mothers

SPP-17 Use of preventive measures against the spread of Corona virus among bank workers of Galle district during the COVID-19 pandemic in Sri Lanka

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Background: With regard to a preventing a communicable disease, practicing effective preventive measures in the correct way is the cornerstone.

Objective: This study was conducted to assess the use of preventive measures against the spread of corona virus among bank workers of Galle district during the COVID-19 pandemic in Sri Lanka.

Methods: A cross-sectional study was conducted among 427 bank workers selected by multi stage cluster sampling method in 31 selected banks of Galle district using a self-administrated questionnaire. Chi square test 0.05 significance was used to assess the associated factors with preventive measures.

Results: Out of total sample, majority are males (n=256, 60.9%) with mean (SD) age of 33.8 (6.3) years. All the participants were well aware about recent COVID-19 pandemic. All the workers wear face masks at their work place properly while majority use surgical masks (66.6%). One fourth of the sample (25.1%) reused face masks and 59.3% wear a single mask during the whole working hours. Wearing gloves during working (52.7%), use of correct hand washing techniques using soap and water (63.8%), maintaining one-meter distance with customers and other staff members (61.6%) and disinfection of bank premises several times per day (82.2%) were identified as main preventive measures. Use of public transport to travel to the work station (50.8%) and difficulties in following safety measures while attending duties (53.9%) were identified as main challenges faced by them during pandemic. None of the sociodemographic factors and service related factors were identified as statistically significant with use of preventive measures.

Conclusions and recommendations: Practicing preventive measures against the corona virus transmission was identified with significant proportions but need to improve further to minimize risk of COVID-19 transmission. Need to address challenges faced by bank workers to ensure safety themselves as well as customers.

Keywords: preventive measures, bank workers, COVID-19 pandemic

SPP-18 Use of alternative medicine for the management of communicable diseases in the Bope-Poddala MOH area

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Background: Use of alternative medical practices are common many communities even in the presence of sophisticated western medical practices specially for communicable diseases including recent COVID-19 pandemic.

Objective: This study was conducted to assess the use of alternative medicine for the management of communicable diseases, in the Bope-Poddala MOH area.

Methods: A cross-sectional study was conducted among 410 adults in which selected using multi stage cluster sampling method in Bope-Poddala MOH area. An interviewer administered questionnaire was used for collection of data. Chi-square test at 0.05 significance level was used to identify associated factors with use of alternative medicine for the management of communicable diseases.

Results: Out of the total sample majority were females (70.2%) and 40 years and above (61.7%) with a mean age (SD) of 44.5 (10.3) years. The prevalence of usage of alternative medical practices for communicable diseases was 67.8%. Highest percentage of the population used alternative medication as a treatment for conjunctivitis (47.5%) followed by varicella (44.4%), mumps (40.9%) and dengue (20.2%) respectively. Majority (77.8%) has used alternative medical practices for recent COVID-19 as prophylaxis; Ginger & Coriander mixed drinks (89.0%), Asafoetida (42.6%) and turmeric water as disinfectant (3.4%). Knowledge from the parents or neighbours was identified as the commonest source of information (91.5%) while prior experiences or having heard about the success (90.9%) was identified as commonest reason for selection to use alternative medical practices. However, Majority were not aware on scientific basis (83.2%) or adverse effects of the overdose of herbal treatments (65.1%) of alternative medicine use. People who were aged 40 years & above ($p < 0.001$) and educated less than GCE O/L ($p < 0.001$) were more likely to use alternative medicine for the management of communicable diseases.

Conclusions and recommendations: Alternative medical practices for the management of communicable diseases were identified with a high prevalence in the study. With the occurrence of COVID-19 pandemic, the use of alternative medical practices as prophylaxis has become prominent. Proper awareness of alternative medical practices in disease prevention and management will be required as older and less educated adults were more likely to use alternative medicines.

Keywords: alternative medicine, management, communicable diseases, COVID-19



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