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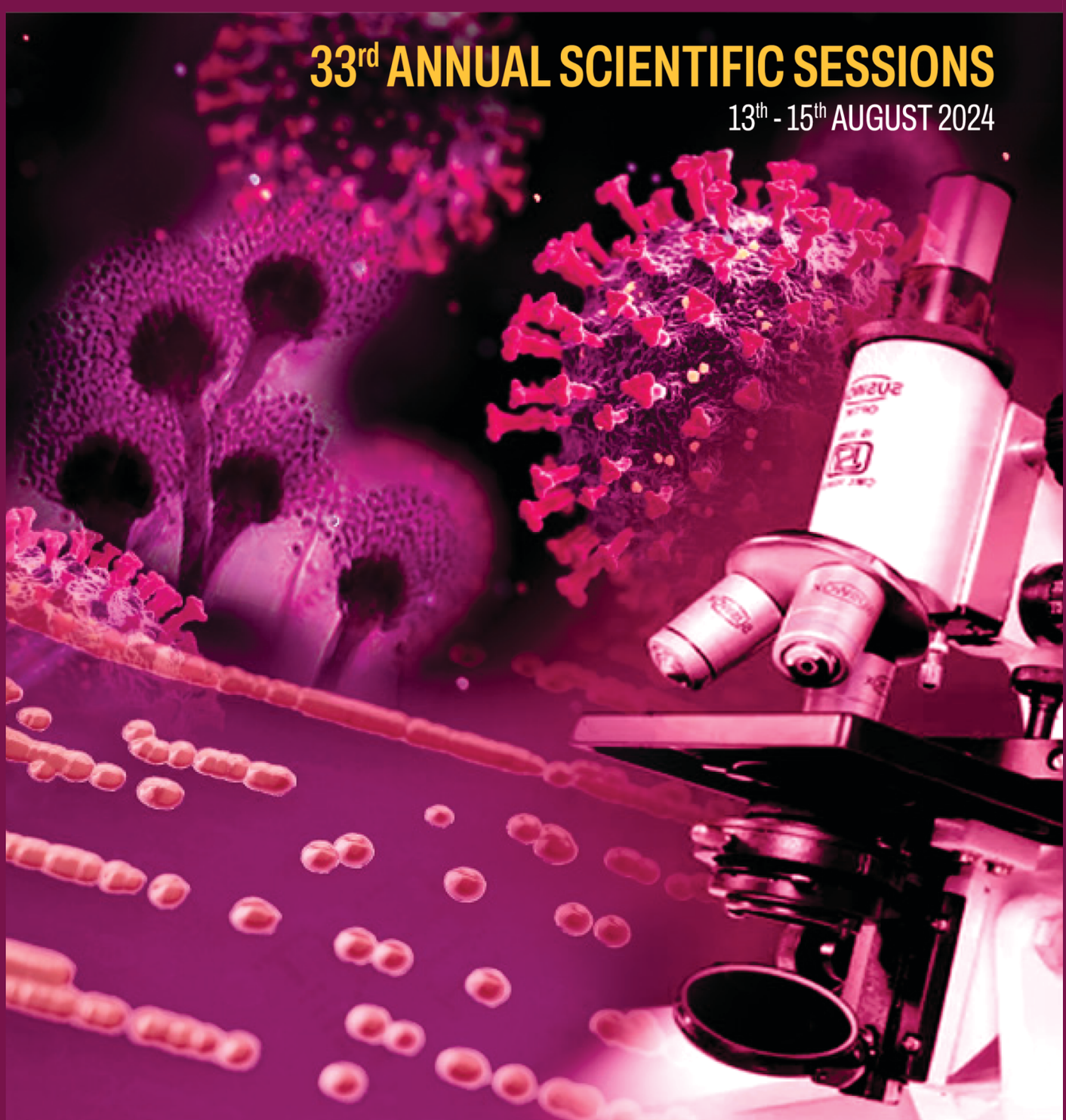
SRI LANKA COLLEGE OF MICROBIOLOGISTS



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The Bulletin
of the
Sri Lanka College of Microbiologists

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Contents

=:

The Sri Lanka College of Microbiologists
Council 2023 / 2024

Seated (L – R) : Dr. Nilanthi Senanayake (Co-Treasurer), Dr. Sujatha Pathirage (President Elect), Dr. Chathuri Gunasekera (Hon. Joint Secretary), Dr. Malika Karunaratne (President), Dr. Naamal Jayawardena (Hon. Joint Secretary), Dr. Varuna Navaratne (Co-Editor), Dr. Saranga Sumathipala (Co-Treasurer)

Standing (L – R) : Dr. Samanmalee Gunasekara, Dr. Thanuja Ranasinghe, Dr. Rohitha Muthugala, Dr. Rohini Wadanamby, Dr. Lilani Karunanayake, Dr. Kishani Dinapala, Dr. Dilini Nakkawita

Absent : Dr. Jayanthi Elwitigala, Dr. Roshan Jayasuriya (Co-Editor), , Dr. Vaithehi Francis

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The Sri Lanka College of Microbiologists

Council 2023 / 2024

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Editorial Board 2024

The Bulletin of the Sri Lanka College of Microbiologists is published annually with the Scientific Sessions of the College.

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33rd Annual Scientific Sessions

and

Dr. Siri Wickremesinghe Memorial Oration

of the

Sri Lanka College of Microbiologists

13th to 15th August 2024

Balmoral
Kingsbury Hotel
Colombo

33rd Annual Scientific Sessions

of the

Sri Lanka College of Microbiologists

"Realizing cost effective, high-quality clinical microbiology"

Pre-Congress Workshop

"Preventing deaths from sepsis: turn the tide"

13th August 2024

Balmoral, Kingsbury Hotel

Colombo

Inauguration Ceremony &
Dr. Siri Wickremesinghe Memorial Oration 2024

13th August 2024

at 6.00pm

Balmoral, Kingsbury Hotel

Colombo

Scientific Programme

14th and 15th August 2024

Balmoral, Kingsbury Hotel

Colombo

Message from the Chief Guest

It gives me great pleasure to pen a congratulatory message on the Inauguration Ceremony & Dr Siri Wickremesinghe Memorial Oration 2024 of the Sri Lanka College of Microbiologists as the Chief Guest.

Sri Lanka College of Microbiologists has progressed immensely from 1969 to present day as the leading professional body facilitating diagnosis and management of infectious diseases and spearheading infection prevention and control activities, while combating antimicrobial resistance in Sri Lanka.

Under the leadership of the Sri Lanka College of Microbiologists, great strides have been made for the advancement of Medical Microbiology in Sri Lanka.

The theme for this year, “Realising cost-effective, high-quality clinical microbiology,” is timely and appropriate for Sri Lanka aligning well with the widely accepted global trend. It addresses fundamental aspects of clinical microbiology to enhance patient outcomes and safety while being cost effective. I believe that it is crucial to foster a multidisciplinary team spirit, among clinicians, policymakers, administrators, with the microbiologists, to realise this objective.

I am confident that the holistic initiative taken by Sri Lanka College of Microbiologists will be a resounding success.

I congratulate the President and the Council of the College for their dedicated efforts in enlightening stakeholders about these health challenges and sustainable solutions, and I wish the Sessions of the Sri Lanka College of Microbiologists every success.

Hon. Dr. Ramesh Pathirana
Minister of Health
Ministry of Health

Message from the Guest of Honour

It is my great pleasure to extend my heartiest wishes to the 33rd annual Scientific Sessions of the Sri Lanka College of the Microbiologists.

The theme for this year's session, "Realising Cost-Effective, High-Quality Clinical Microbiology," is both timely and crucial as we navigate through an era marked by significant advancements in medical science and unprecedented global health challenges.

Clinical microbiology plays a pivotal role in the diagnosis, treatment, and prevention of infectious diseases. The importance of accurate and timely microbiological analysis cannot be overstated, as it directly impacts patient outcomes, infection control, and public health. However, achieving high-quality clinical microbiology services in a cost-effective manner remains a formidable challenge, especially in resource-limited settings.

As we embark on this journey to realize cost-effective, high-quality clinical microbiology, let us be guided by our commitment to excellence and our dedication to improving patient care. The collective expertise and passion within this college are tremendous assets, and I am confident that our discussions and collaborations will pave the way for significant advancements in the field.

I wish all participants a fruitful and inspiring session, and I look forward to witnessing the innovative ideas and solutions that will emerge from our deliberations.

Dr. P. G. Mahipala
Secretary of Health
Ministry of Health

Message from the President

It is with great honour and enthusiasm that I welcome you to the 33rd Annual Scientific Sessions of the Sri Lanka College of Microbiologists.

Embracing this year's theme, "Realizing Cost-Effective, High-Quality Clinical Microbiology", the Annual Scientific Sessions strengthens our collective aspiration to ensure the best patient outcomes and safety.

We are delighted to have a distinguished array of local and foreign guest speakers in our sessions, who will share their insights and expertise with us. This time we have foreign speakers on-site for the first time since the COVID 19 pandemic. This will undoubtedly enrich our scientific discussions and help foster future partnerships to advance medical microbiology in Sri Lanka.

Our program is designed to promote learning, collaboration, and the exchange of innovative ideas. The topics for the symposia and plenary lectures were decided considering the importance of preparedness of the laboratory for early response to future pandemics, the threat of resurgence of tuberculosis worldwide, the growing challenge of antimicrobial resistance, and the need for rational ordering of laboratory investigations.

In addition to the main sessions, we offer a pre-congress workshop focused on sepsis, a critical and timely topic that impacts patient outcomes significantly. This workshop is an excellent opportunity to broaden our understanding and improve the approach in managing sepsis, ultimately saving more lives at a lower cost.

I take this opportunity to thank our chief guest, Honourable Minister of Health Dr Ramesh Pathirana and the guest of honour, Secretary of Health, Dr Palitha Mahipala for accepting our invitations to the inauguration ceremony, amidst their busy schedules. I thank all our guest speakers from near and far for raising our sessions to a higher academic standard.

While extending a special word of thanks to the family of late Dr. Siri Wicremesinghe for gracing the inauguration ceremony and for the continuation of the Dr Siri Wickremesinghe memorial scholarship for best MD dissertation proposal, I congratulate Prof. Neelika Malavige, the Dr Siri Wickremesinghe memorial orator.

I extend my gratitude to the council members for their support and hard work. A special mention should be made of the two honorary joint secretaries, Dr. Chathuri Gunasekera and Dr. Naamal Jayawardena whose tireless efforts have been pivotal in bringing the sessions to life.

I extend a special appreciation to all college members who have actively contributed to the college activities this year in numerous ways. This year we have reached several important milestones of the antimicrobial stewardship programme. Namely, the development of the National Guideline for Antimicrobial Stewardship Programme in Healthcare Institutions of Sri Lanka, the creation of a dedicated antimicrobial prescription chart with the Health Number 1338 and the SR number-60100201, the issuance of the AWaRe classification and its circular and, the launch of the second edition of the National Guidelines on Empirical and Prophylactic use of antimicrobials. Establishing a systematic antimicrobial stewardship programme in hospitals is an immense challenge which needs multidisciplinary team effort. We must join our hands with the Ministry of Health in this landmark endeavour to fight against antimicrobial resistance, save lives, and save antimicrobials for generations to come.

Yet another key activity is developing a guide for clinicians on the rational ordering of microbiology investigations, recognizing its timely need. Ordering the right test, for the right patient, at the right time not only enhances patient outcomes, but undoubtedly holds economic benefits. I happily announce that this guide will be launched at the inauguration ceremony of this year's Annual Scientific Sessions.

I also thank the World Health Organization for the financial support for WAAW 2023 celebrations and the project to develop the multi-stakeholder National Strategic Plan for Combating Antimicrobial Resistance for 2023-2028. It was launched early this year and subcommittees were appointed to roll out the strategies at the national level, together with “One Health” stakeholders.

I am very thankful to our two office secretaries, Mrs. Priyanga Opatha and Mrs. Amanda Jayasooriya, who go beyond the call of duty to ensure the smooth functioning of all college activities and their enthusiasm and dedication to this event is highly appreciated.

On behalf of the council of Sri Lanka College of Microbiologists, I wish to acknowledge and thank our sponsors for their invaluable support, which is crucial in making an event of this magnitude possible. Their commitment to advancing the field of medical microbiology is truly commendable.

Let us work together realizing cost-effective, high-quality clinical microbiology.

Dr. Malika Karunaratne
President,
Sri Lanka College of Microbiologists

Message from Honorary Joint Secretaries
2023/2024

Dr. Chathuri Gunasekera
Honorary Joint Secretary
Sri Lanka College of Microbiologists

Dr. Naamal Jayawardena
Honorary Joint Secretary
Sri Lanka College of Microbiologists

It gives us great pleasure in welcoming you to the 33rd Annual Scientific Sessions of the Sri Lanka College of Microbiologists. The Annual Scientific Sessions is the centerpiece of academic activities in the College calendar year, and we are excited for you to participate at this year's activities.

The theme for this year is ***"Realizing cost-effective, high-quality clinical microbiology".*** As evidenced by the numerous activities to this effect undertaken during the current calendar year spearheaded by the Sri Lanka College of Microbiologists so far, we are certain that this realization is within our reach. Thus, this years' annual academic sessions have also attempted to explore the possibilities and challenges faced in "realizing cost-effective and high-quality clinical microbiology".

We have many prestigious local and international speakers who are leaders in the field of microbiology, including its sub-specialities, gracing us with their presence at this year's annual academic sessions. Additionally, we have several eminent speakers from other specialities, who will speak on their areas of expertise, highlighting the importance of multidisciplinary team work.

The inauguration ceremony of the Annual Scientific Sessions has been combined with the Dr. Siri Wickremesinghe Memorial Oration and we are sure this will be a wonderful evening to remember.

Putting together two and a half days' academic activities is no easy task. We would like to thank everyone who contributed to this enormous task, in their own special way.

We hope you will utilize this opportunity to widen and update your knowledge in the field of microbiology whilst taking the opportunity to strengthen your professional networks.

Inauguration Programme

5.30 pm	Invitees take their seats
5.45 pm	Arrival of the Chief Guest Introduction of members of the Council
6.00 pm	Ceremonial procession
6.05 pm	National Anthem
6.10 pm	Lighting of the traditional oil lamp
6.20 pm	Welcome Address Dr. Naamal Jayawardena Honorary Joint Secretary
6.30 pm	Presidential Address by Dr. Malika Karunaratne President, SLCM
7.00 pm	Introduction of the Guest of Honour by Dr. Malika Karunaratne President, SLCM
7.05 pm	Address by the Guest of Honour Dr. P. G. Mahipala Secretary of Health, Ministry of Health
7.15 pm	Introduction of the Chief Guest by Dr. Malika Karunaratne President, SLCM
7.20 pm	Address by the Chief Guest Dr. Ramesh Pathirana Hon. Minister of Health, Ministry of Health
7.30 pm	Introduction of the orator and award of Dr. Siri Wickremesinghe Memorial Oration Medal to Prof. Neelika Malavige by Dr. Malika Karunaratne, President, SLCM
7.35 pm	Dr. Siri Wickremesinghe Memorial Oration 2024 *'Plugging the vascular leak in dengue'* Prof. Neelika Malavige Professor, Department of Immunology and Molecular Medicine, University of Sri Jayewardenepura
8.15 pm	Awarding of Dr. Siri Wickremesinghe Memorial Scholarship 2024
8.20 pm	Award of SLCM Fellowships
8.35 pm	Vote of Thanks Dr. Chathuri Gunasekera Honorary Joint Secretary

Programme at a glance

Time	14th August 2024	Time	15th August 2024
7.30 a.m. – 8.00 a.m.	Registration	7.30 a.m. – 8.00 a.m.	Registration
8.00 a.m. – 8.45 a.m.	Free paper session 1	8.00 a.m. – 8.30 a.m.	Free paper session 2
8.45 a.m. – 9.00 a.m.	Tea	8.30 a.m. – 9.00 a.m.	Plenary 5 Anti-fungal stewardship in resource limited settings
9.00 a.m. – 10.45 a.m.	Symposium 1 Multi drug resistant (MDR) Gram negative organisms	9.00 a.m. – 9.15 a.m.	Tea
10.45 a.m.–11.15 a.m.	Plenary 1 Urology in urinary tract infections: Prevention, management and improving patient quality of life	9.15 a.m.- 11.00 a.m.	Symposium 3 Important aspects of Tuberculosis
11.15 a.m. –12.00 noon	Plenary 2 Cytokines and infections: friends or foe?	11.00 a.m. – 11.30a.m.	Plenary 6 Drug resistance in malaria
12.00 noon – 1.15 p.m.	Lunch	11.30 a.m.- 12.15 p.m.	Plenary 7 The Clinical application of next-generation sequencing in infectious diseases: Clinical diagnosis, surveillance and detection of emerging infections
1.15 p.m. – 2.45 p.m.	Symposium 2 Pandemic preparedness and response: Upgrading medical defenses	12.15 p. m. – 1.00 p.m.	Lunch
2.45 p.m. - 3.15 p.m.	Plenary 3 HIV associated opportunistic infections	1.00 p.m. – 1.30 p.m.	Plenary 8 Management of Visceral Leishmaniasis and its Elimination from the Indian Subcontinent
3.15 p.m. – 4.15 p.m.	Case based discussion on difficult to manage infections	1.30 p.m. – 2.30 p.m.	Expert Panel discussion Rational use of microbiology – together, for better patient care
4.15 p.m. – 4.45 p.m.	Plenary 4 Strategies to combat AMR	2.30 p.m. – 3.15 p.m.	Plenary 9 Role of antimicrobial consumption and antimicrobial use parameters for an effective antimicrobial stewardship Programme
4.45 p.m.	Tea and End of the Day-1 proceedings	3.15 p.m. – 4. 00 p.m.	Case based discussion in Mycology
		4.00 p.m.	Award ceremony and close of conference
		4.15 p.m.	Tea

Pre-congress workshop and Scientific programme

13th August 2024

Pre-congress workshop - “Preventing deaths from sepsis: turn the tide”

Chairpersons – Dr. Kushlani Jayatilleke and Dr. Shirani Chandrasiri

7.30 a.m. - 8.10 a.m.	**Registration**
8.10 a.m. - 8.15 a.m.	**National Anthem**
8.15 a.m. - 8.20 a.m.	**Lighting of the traditional oil lamp**
8.20 a.m. - 8.25 a.m.	**Welcome Address** Dr. Malika Karunaratne President, SLCM
8.25 a.m. - 8.30 a.m.	**Address by the Chief Guest of the Pre-congress workshop** Dr. Vinodini Wanigasekara Consultant Anaesthetist, National Hospital of Sri Lanka President, College of Anaesthesiologists and Intensivists of Sri Lanka and Ex-officio, Sri Lanka Sepsis Alliance
8.30 a.m. - 9.00 a.m.	***Importance of an implementation of multidisciplinary program for sepsis*** Dr. Mahen Kothalawala Consultant Microbiologist, National Hospital of Sri Lanka, Colombo, Sri Lanka
9.00 a.m. - 9.30 a.m.	***Role of first responders in preventing deaths due to sepsis and septic shock*** Dr. Indika de Lanerolle Consultant Emergency Physician, National Hospital of Sri Lanka, Colombo, Sri Lanka
9.30- a.m. - 10.00 a.m.	***Rapid diagnosis of infections in sepsis: Needs, challenges and solutions*** Dr. Aruna Poojary Laboratory Director, Department of Pathology & Microbiology, In charge Infection Prevention & Control, Breach Candy Hospital Trust, Mumbai. India.
10.00 a.m.- 10.20 a.m.	**Discussion - Part I**
10.20 a.m. - 10.40 a.m.	**Tea**
10.40 a.m. - 11.10 a.m.	***Newer treatment strategies for sepsis and septic shock: Focus of the infectious disease physician*** Prof. David Paterson Infectious Disease Clinician, National University of Singapore
11.10 a.m. - 11.30 p.m.	***Pharmacokinetics and Pharmacodynamics of antimicrobials in sepsis*** Prof. Priyadarshani Galappatthy Senior Professor and Chair Professor of Pharmacology, Faculty of Medicine, University of Colombo, Sri Lanka President, Sri Lanka Association of Clinical Pharmacology and Therapeutics (SLACPT)
11.30 a.m.-12.00 noon	***Immunotherapy and sepsis: Current landscape and future advances*** Prof. Suranjith Seneviratne Professor and Consultant in Clinical Immunology, Allergy and Immunogenetics, Royal Free Hospital, University College London and Health Services Laboratories, London, United Kingdom
12.00 p.m. -12.30 p.m.	**Discussion - Part II**
12.30 p.m.	**Lunch and end of the session**

Day 1 - Scientific programme -14th August 2024

7.30 a.m. – 8.00 a.m.	**Registration**
8.00 a.m. – 8.45 a.m.	**Free paper session 1** Chairpersons – Prof. Nilanthi Dissanayake and Dr. Thanuja Ranasinghe
OP 1	**Association of *Staphylococcus aureus* bacteriuria with *Staphylococcus aureus* bacteremia as an indicator of the prognosis of infection** *Madumali DI[1], Piyasiri DLB[1]* [1]Teaching Hospital, Karapitiya, Galle, Sri Lanka
OP 2	**Study on gut colonisation of carbapenemase producing organisms among patients with haematological malignancies in National Cancer Institute, Sri Lanka** *Dissanayake Y[1], Dissanayake DMBT[2], Gunasekara SP[1]* [1]Department of Microbiology, National Cancer Institute, Maharagama, [2]Department of Microbiology, University of Sri Jayewardenepura
OP 3	**Prevalence of antimicrobial resistance in natural water bodies of Gampaha district** *Jinadasa RJSA[1], Badanasinghe CN[1], Pathirage SC[2]* [1] Department of Microbiology, Faculty of Medicine, University of Kelaniya, [2] Department of Food and Water, Medical Research Institute
8.45 a.m. – 9.00 a.m.	**Tea**
9.00 a.m. – 10.45 a.m.	**Symposium 1 – Multi drug resistant (MDR) Gram negative organisms** Moderators – Dr. Lilani Karunanayake and Dr. Dhananja Namalie ***Laboratory Detection of drug resistant mechanisms in MDR organisms: Conventional to advanced methods*** Dr. Deborah Pakshmala Gnanarajah Consultant Microbiologist, University hospitals of Derby & Burton Royal Derby Teaching hospital, United Kingdom ***Management of infections caused by resistant Gram-negative organisms: Novel Therapeutic Options*** Prof. David Paterson Infectious Disease Clinician, National University of Singapore ***Control the spread of multi drug resistant* Acinetobacter *in Intensive Care Units: A Multifaceted Approach*** Prof. Dale Fisher Professor of Medicine, National University of Singapore
10.45 a.m.–11.15 a.m.	**Plenary 1** Chairperson – Dr. Muditha Abeykoon ***Urology in urinary tract infections: Prevention, management and improving patient quality of life*** Dr. Manjula Wijewardena Consultant Urologist, National Hospital of Sri Lanka, Colombo, Sri Lanka, President, Sri Lanka Association of Urological Surgeons

11.15 a.m. –12.00 noon	**Plenary 2** Chairperson – Dr. Nadisha Badanasinghe ***Cytokines and infections: friends or foe?*** Prof. Suranjith Seneviratne Professor and Consultant in Clinical Immunology, Allergy and Immunogenetics, Royal Free Hospital, University College London and Health Services Laboratories, London, United Kingdom
12.00 noon – 1.15 p.m.	**Lunch**
1.15 p.m. – 2.45 p.m.	**Symposium 2- Pandemic preparedness and response: Upgrading medical defenses** Moderators – Prof. Enoka Corea and Dr. Geethani Galagoda ***Overview of emerging infections with pandemic potential*** Prof. Malik Peiris Chair Professor in Virology, The School of Public Health, University of Hong Kong ***Strengthening early laboratory response to high- consequence emerging infectious disease threats*** Dr. Catherine Houlihan Consultant in Infection, Rare and Imported Pathogens Laboratory, UKHSA. Consultant Virologist, University College London Hospitals NHS Foundation Trust, United Kingdom ***Infection prevention and control: Before, during and after the pandemic*** Prof. Dale Fisher Professor of Medicine, National University of Singapore
2.45 p.m. - 3.15 p.m.	**Plenary 3** Chairperson – Dr Rohitha Muthugala ***HIV associated opportunistic infections*** Dr. Lakmal Fonseka Consultant physician, University Medical Unit, National Hospital, Galle and Department of Medicine, University of Ruhuna
3.15 p.m. – 4.15 p.m.	**Case based discussion on difficult to manage infections** Moderator – Dr. Upeksha Samarakoon Prof. Panduka Karunanayake Professor, Specialist Physician in the Professorial Unit in Medicine Department of Clinical Medicine, Faculty of Medicine, University of Colombo, Sri Lanka & Dr. Geethika Patabendige Consultant Clinical Microbiologist, National Hospital of Sri Lanka, Colombo, Sri Lanka

4.15 p.m. – 4.45 p.m.	***Plenary 4*** Chairperson – Dr. Samanmalee Gunasekera ***Strategies to combat AMR*** Dr. Kirupa Somasundaram Lab Director, Infection Control officer, Consultant Microbiologist, HICO, Prashanth Hospitals, Chennai
4.45 p.m.	**Tea and End of the Day - 1 proceedings**

Day 2 - Scientific programme - 15th August 2024

7.30 a.m. – 8.00 a.m.	**Registration**
8.00 a.m. – 8.30 a.m.	**Free paper session 2** Chairpersons - Dr. Nuwani Manamperi and Dr. Naamal Jayawardena
OP 4	**Strongyloidiasis among primary school children in Anuradhapura district, Sri Lanka** *Jayakody N.K[1], Silva NKA[2], Wickrmamsinghe WDSJ[3], Wijayasekara AE[1], Karunarathne CB[4], de Silva NR[5], Weerakoon KGAD[2]* [1] Department of Parasitology, Faculty of Medicine, Wayamba University of Sri Lanka, [2] Department of Parasitology, Faculty of Medicine and Allied Sciences, Rajarata University of Sri Lanka, [3] Department of Parasitology, Faculty of Medicine, University of Peradeniya, [4] Department of Physiology, Faculty of Medicine, Wayamba University of Sri Lanka, [5] Department of Parasitology, Faculty of Medicine, University of Kelaniya
OP 5	**Identification of *Cryptococcus* species and their antifungal susceptibilities, including synergistic combinations** *Sigera LSM[1], Thabrew HHPM[1], Ediriweera D[2], Fathima Shabry UL[1], Malkanthi MA[1], Jayasekera PI[1]* [1]Department of Mycology, Medical Research Institute, Colombo, [2]Centre for Health Informatics, Biostatistics and Epidemiology, Faculty of Medicine, University of Kelaniya
8.30 a.m. – 9.00 a.m.	**Plenary 5** Chairperson – Dr. Primali Jayasekera ***Anti-fungal stewardship in resource limited settings*** Dr. Arunaloke Chakrabarti Director, Doodhdhari Burfani Hospital & Research Institute, Bhupatwala, Haridwar, Uttarakhand, India
9.00 a.m. – 9.15 a.m.	**Tea**
9.15 a.m.- 11.00 a.m.	**Symposium 3 - Important aspects of Tuberculosis** Moderators – Dr. Nilanthi Senanayake and Dr. Bhagya Bolonne ***Tuberculosis: The growing epidemic and the Sri Lankan situation*** Dr. Mizaya Cader Consultant Community Physician, National Programme for Tuberculosis Control and Chest Diseases, Colombo, Sri Lanka

	Atypical presentations of tuberculosis Dr. Neranjan Dissanayake Consultant Pulmonologist, Teaching Hospital, Kalutara, Sri Lanka, President Sri Lanka College of Pulmonologists ***Laboratory diagnosis of tuberculosis: Basics to the state of the art*** Dr. Marilyn Mary Ninan Associate Professor, Department of Clinical Microbiology, Christian Medical College, Vellore, India ***Halt the Spread of MDR TB in Hospital Settings: Applying Engineering Principles for Isolation rooms*** Prof. Terrence Rohan Chinniah Consultant Clinical Microbiologist, Division of Microbiology, Department of Pathology, Raja Isteri Pengiran Anak Saleha Hospital, Brunei Darussalam
11.00 a.m. –11.30a.m.	**Plenary 6** Chairperson – Dr. Sanath Senanayake ***Drug resistance in malaria*** Prof. Shyam Sundar Professor of Medicine, Institute of Medical Sciences, Baranas Hindu University, Varanasi ,India
11.30 a.m.- 12.15 p.m.	**Plenary 7** Chairperson – Dr. Saranga Sumathipala ***The Clinical application of Next-generation sequencing in infectious diseases: Clinical Diagnosis, surveillance and detection of emerging infections*** Dr. Catherine Houlihan Consultant in Infection, Rare and Imported Pathogens Laboratory, UKHSA. Consultant Virologist, University College London Hospitals NHS Foundation Trust, United Kingdom
12.15 p. m. – 1.00 p.m.	**Lunch**
1.00 p.m. – 1.30 p.m.	**Plenary 8** Chairperson - Prof Shalindra Ranasinghe ***Management of Visceral Leishmaniasis and its elimination from the Indian Subcontinent*** Prof. Shyam Sundar Professor of Medicine, Institute of Medical Sciences, Baranas Hindu University, Varanasi, India
1.30 p.m. – 2.30 p.m.	**Expert Panel Discussion** ***Rational use of microbiology – together, for better patient care*** Moderators – Prof. Nelun de Silva and Dr. Dilini Nakkawita Prof. Ishan de Zoysa Professor in Surgery Department of Surgery, Faculty of Medicine, University of Colombo, Sri Lanka Dr. Upul Dissanayake Consultant Physician, National Hospital of Sri Lanka, Colombo, Sri Lanka, President, Ceylon College of Physicians

	Dr. Kushlani Jayatilleke Consultant Microbiologist, Sri Jayewardenepura General Hospital, Nugegoda, Sri Lanka Dr. Deepal Perera Consultant Paediatrician, Lady Ridgeway Hospital for Children, Colombo, Sri Lanka
2.30 p.m. – 3.15 p.m.	**Plenary 9** Chairperson – Dr. Deepika Priyanthi ***Role of antimicrobial consumption and antimicrobial use parameters for an effective antimicrobial stewardship Programme*** Prof. Shalini Sri Ranganathan Senior Professor in Pharmacology and Specialist in Paediatrics, Department of Pharmacology, Faculty of Medicine, University of Colombo, Sri Lanka
3.15 p.m. – 4.00 p.m.	**Case based discussion in Mycology** Moderators – Dr. Naamal Jayawardena and Dr. Harshani Thabrew Dr. Arunaloke Chakrabarti Director, Doodhdhari Burfani Hospital & Research Institute, Bhupatwala, Haridwar ,Uttarakhand, India
4.00 p.m.	**Award ceremony and close of conference**
4.15 p.m.	**Tea**

List of e-Posters

Date	Time	PP No	
14.08.2024	**12.00 noon to 12.15 p.m.**	**PP 1**	**Association of diabetes mellitus with the disease entity and clinical parameters in culture positive melioidosis** *Piyasiri DLB[1], Jayasekera PK[1], Corea EM[2]* [1] Teaching Hospital Karapitiya, Galle, Sri Lanka, [2] Faculty of Medicine, University of Colombo, Sri Lanka
		PP 2	**Prevalence and predictors of MRSA colonization among healthcare workers in surgical and special units in a tertiary care hospital in the Western Province of Sri Lanka** *Makeen FS[1], Badanasinghe N[2]* [1]Postgraduate Institute of Medicine, University of Colombo, [2]Department of Microbiology, Faculty of Medicine, University of Kelaniya
		PP 3	**Point prevalence survey on usage of antibiotic prophylaxis in surgical wards in Colombo North Teaching Hospital** *Herath HMML[1], Namalie KD[1]* [1]Colombo North Teaching Hospital,
		PP 4	**Prevalence of community-acquired MRSA nasal colonization in outpatients in a tertiary care hospital and antibiotic susceptibility of the isolates.** *Dassanayake NHK[1], Badanasinghe CN[1], Gunaratna GPS[1], Dasanayake D[2]* [1]Department of Microbiology, Faculty of Medicine, Ragama, [2]Department of Immunology, Medical Research Institute, Colombo
	12.15 p.m. to 12.30 p.m.	**PP 5**	**Identification of Shiga Toxin producing *Escherichia coli* in children with diarrhoea in a tertiary care pediatric hospital in Sri Lanka** *Welagedara PGRIS[1], Pathirage S[1]* [1] Department of Enteric Bacteriology, Medical Research Institute, Colombo
		PP 6	**Two-year analysis of respiratory viruses in acute infections: Insights from a National Laboratory** *Ranaweera ME[1], Liyanage GA[2], Kularathna HNS[1], Jayamaha CJ[1]* [1]Department of Virology, Medical Research Institute, Colombo, [2]The National Hospital of Sri Lanka, Colombo
		PP 7	**Viral aetiological agents and clinical presentations in a respiratory outbreak in Kalawana, Ratnapura district, Sri Lanka, June 2022.** *Palipane EG[1], Lokuge DR[2], Rathnawali HGT[2], Jayamaha CJS[1],* [1]Department of Virology, Medical Research Institute, Colombo, [2]Base Hospital Kalawana, Kalawana.
		PP 8	**Efficacy of Germ Tube Method in Differentiation of *Candida* Isolates** *Wanigasekara DN[1], Wickramasinghe SS[2], Wijayaratne WMDGB[2], Napagoda MT[1]* [1]Department of Biochemistry, Faculty of Medicine, University of Ruhuna, Galle, [2]Department of Microbiology, Faculty of Medicine, University of Ruhuna, Galle

		PP 9	**Identification and antifungal susceptibility pattern of fungi causing keratitis in a local setting** *Sigera LSM[1], Fathima Shabry UL[1], Malkanthi MA[1], Jayasekera PI[1]* [1]Department of Mycology, Medical Research Institute, Colombo
	12.30 p.m. to 12.45 p.m.	**PP 10**	**Antifungal sensitivities of common *Mucorales* species isolated from sino-nasal specimens in Sri Lanka from 2014 to 2021** *Welagedara PGRIS[1], Jayasekara PI[1]* [1]Department of Mycology, Medical Research Institute, Colombo
		PP 11	**Anti-Candida activity of *Aegle marmelos* (Bael) and *Munronia pinnata* (Ground bitter): A preliminary study** *Siriwardana KMSCP[1], Jayasekara KG[1], Wickramasinghe SS[2]* [1]Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Ruhuna, [2]Department of Microbiology, Faculty of Medicine, University of Ruhuna

Case Presentations 2024

CP 1	***Streptococcus pneumoniae* meningitis mimicking eclampsia in a 36 -year-old pregnant patient: A case report** *Kuruppu Arachchi KAP[1], Priyaranganie WKAP[1], SK Abeysinghe[1]* [1]District General Hospital, Hambantota, Sri Lanka
CP 2	**Poor dental hygiene leading to *Gemella morbillorum* brain abscess? A case report.** *Silva SCUM[1], Piyasiri DLB[1], Gunasekera N[1], Senaratne WGG[1], Samarathunga MSTN[1] Dias KMGHH[1]* [1]Teaching Hospital Karapitiya, Galle, Sri Lanka
CP 3	**Complicated *Salmonella* Enteritidis sepsis with fatal empyema in a patient with chronic immune thrombocytopaenic purpura: A case report** *Dias KMGHH[1], Piyasiri DLB[1], Uluwattage W[1], de Zoysa MWK[1], Edirisinghe EWB[1], Silva SCUM[1]* [1]Teaching Hospital, Karapitiya, Galle, Sri Lanka
CP 4	***Stenotrophomonas* species pulmonary infection in a patient with Chronic Granulomatous Disease** *Fernando KDL[1], Withana APH[1], Wijesinghe MADPK[1], Senarathne RKCN[1], Bandara KMT[1] Dasanayake D[2], Viknarajah S[1], Vidanagama DS[1], de Silva R[2]* [1]Lady Ridgeway Hospital, [2]Department of Immunology, Medical Research Institute
CP 5	**Case report: Parvovirus B19 induced Pure Red Cell Aplasia (PRCA) in a young patient diagnosed with B-Cell Acute Lymphoblastic Leukemia (B-ALL) in Sri Lanka** *Asmir WM[1], De Silva ADP[1], Chathurani PM[1], Imangi SKU[1], Sumathipala S[1]* [1]Department of Clinical virology, National Cancer Institute of Sri Lanka, Apeksha Hospital, Maharagama

CP 6	**BK virus related haemorrhagic cystitis in an allogeneic HSCT recipient : A single center experience** *Akram MAFA[1], Gunarathna KND[2]* [1]Department of Virology, National Hospital Kandy, Sri Lanka, [2]Department of Oncology, National Hospital Kandy, Sri Lanka
CP 7	**Pulmonary mucormycosis in a patient with uncontrolled diabetes mellitus: a case report** *Pemasiri KACC[1], Wijesinghe CN[1], Mendis S[1], Makarim MFM[1], Malavige RL[1], Masaima MNN[1], Jayasekera PI[2], Chandrasiri SN[1]* [1] Colombo South Teaching Hospital, Kalubowila, [2]Medical Research Institute, Colombo 08
CP 8	**Multiple visceral and cutaneous abscesses caused by *Burkholderia pseudomallei* in a healthy female** *Abeywardena HMW[1], Abeykoon MM[1], Kannangara S[1], Ruwanthi R[1], Samarasena A[1], Samaraweera I[1]* [1]National Hospital Kandy

LIST OF GUEST SPEAKERS

Dr. Mahen Kothalawala
Consultant Microbiologist
National Hospital of Sri Lanka, Colombo,
Sri Lanka

Dr. Indika de Lanerolle
Consultant Emergency Physician,
National Hospital of Sri Lanka,
Colombo, Sri Lanka

Dr. Aruna Poojary
Laboratory Director, Department of Pathology &
Microbiology, In charge Infection Prevention &
Control, Breach Candy Hospital Trust, Mumbai. India.

Prof. David Paterson
Infectious Disease Clinician,
National University of Singapore

Prof. Priyadarshani Galappatthy
Senior Professor and Chair Professor of
Pharmacology, Faculty of Medicine,
University of Colombo, Sri Lanka, President,
Sri Lanka Association of Clinical Pharmacology and
Therapeutics (SLACPT)

Prof. Suranjith Seneviratne
Professor and Consultant in Clinical Immunology,
Allergy and Immunogenetics, Royal Free Hospital,
University College London and Health Services Laboratories,
London, United Kingdom

Dr. Deborah Pakshmala Gnanarajah
Consultant Microbiologist, University hospitals of Derby &
Burton Royal Derby Teaching hospital,
United Kingdom

Prof. Dale Fisher
Professor of Medicine,
National University of Singapore

Dr. Manjula Wijewardena
Consultant Urologist, National Hospital of
Sri Lanka, Colombo, Sri Lanka, President,
Sri Lanka Association of Urological Surgeons

Prof. Malik Peiris
Chair Professor in Virology,
The School of Public Health,
University of Hong Kong

Dr. Catherine Houlihan
Consultant in Infection, Rare and Imported Pathogens Laboratory, UKHSA. Consultant Virologist, University College London Hospitals NHS Foundation Trust, United Kingdom

Dr. Lakmal Fonseka
Consultant Physician, University Medical Unit, National Hospital, Galle and Department of Medicine, University of Ruhuna

Prof. Panduka Karunanayake
Professor, Specialist Physician in the Professorial Unit in Medicine, Department of Clinical Medicine, Faculty of Medicine, University of Colombo, Sri Lanka

Dr. Geethika Patabendige
Consultant Microbiologist, National Hospital of Sri Lanka, Colombo, Sri Lanka

Dr. Arunaloke Chakrabarti
Director, Doodhdhari Burfani Hospital & Research Institute, Bhupatwala, Uttarakhand, India

Dr. Mizaya Cader
Consultant Community Physician,
National Programme for
Tuberculosis Control and Chest Diseases,
Colombo, Sri Lanka

Dr. Neranjan Dissanayake
Consultant Pulmonologist, Teaching Hospital,
Kalutara, Sri Lanka,
President Sri Lanka College of Pulmonologists

Dr. Marilyn Mary Ninan
Associate Professor,
Department of Clinical Microbiology,
Christian Medical College, Vellore, India.

Prof. Terrence Rohan Chinniah
Consultant Clinical Microbiologist
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Raja Isteri Pengiran Anak Saleha Hospital, Brunei Darussalam

Prof. Shyam Sundar
Professor of Medicine,
Institute of Medical Sciences,
Baranas Hindu University, Varanasi, India

Prof. Ishan de Zoysa
Professor in Surgery Department of Surgery,
Faculty of Medicine,
University of Colombo, Sri Lanka

Dr. Upul Dissanayake
Consultant Physician,
National Hospital of Sri Lanka, Colombo,
Sri Lanka, President, Ceylon College of Physicians

Dr. Kushlani Jayatilleke
Consultant Microbiologist,
Sri Jayewardenepura General Hospital,
Nugegoda, Sri Lanka

Dr. Deepal Perera
Consultant Paediatrician,
Lady Ridgeway Hospital for Children, Colombo, Sri Lanka

Prof. Shalini Sri Ranganathan
Senior Professor in Pharmacology and
Specialist in Paediatrics, Department of
Pharmacology Faculty of Medicine,
University of Colombo

Dr. Kirupa Somasundaram
Lab Director, Infection Control officer,
Consultant Microbiologist, HICO,
Prashanth Hospitals, Chennai

Pre-congress Presentations

Importance of an implementation of multidisciplinary program for sepsis

Dr. Mahen Kothalawala

Sepsis is a medical emergency that can appear in many forms. From fever and chills to seemingly unrelated symptoms, its disguise makes timely diagnosis and effective treatment challenging. This complexity arises from how the unique interplay between our immune system, the type of infection, and even the environment influence how sepsis manifests. Ignoring these "different faces" can have devastating consequences.

The fight against sepsis requires a multifaceted approach. Treatment strategies vary depending on the type and source of infection, as well as the stage of sepsis. Early intervention with the right antibiotics and source control is critical. Delays can worsen the condition and lead to organ failure.

Given these complexities, collaboration is key. A multidisciplinary team with experts from emergency medicine,infectious disease, critical care, nursing, and other specialties brings a wealth of knowledge and skills to the table.Through open communication and coordinated efforts, this team ensures a comprehensive and timely approach to sepsis management.

Studies have shown that multidisciplinary programs for sepsis significantly improve patient outcomes. Faster diagnosis and treatment, reduced mortality rates, and improved quality of life are all benefits of this collaborative approach. Sepsis is a formidable foe, but by embracing a multidisciplinary approach, we can unveil its many faces, deliver targeted treatment, and ultimately save lives.

Rapid diagnosis of infections in sepsis: Needs, challenges and solutions

Dr. Aruna Poojary

According to the Global burden of disease study, in 2017, sepsis was responsible for 20% of the deaths occurring worldwide with approximately half of these deaths occurring in children under the age of 5 years. The emergence of antimicrobial resistance (AMR) has made it further difficult to treat patients with sepsis. A study of the global burden of AMR in bacteria in 2019 showed that approximately 1.27 million deaths were attributable to AMR. While conventional methods like blood cultures still remain the gold standard for the diagnosis of sepsis, they are fraught with issues like multiple pre-analytical variables that affect its positivity and delay the turnaround time (TAT).

The need of the hour, therefore, is the rapid diagnosis of the pathogen to optimise sepsis management and improve patient outcomes. This can further be supported by detection of AMR genes, especially in high burden settings allowing rapid initiation of targeted antimicrobial therapy. The common approaches to such newer diagnostics are either rapid testing from positive blood culture bottles or direct blood based analysis for pathogens. These panels adopt a syndromic approach to sepsis diagnosis comprising of a panel of common organisms known to cause sepsis along with the detection of common AMR genes. Mass Spectrometry is another similar tool. Other approaches include use of magnetic resonance based assays and sequencing based techniques which can be performed from direct blood samples. The advantages of these newer techniques can be further improved by continuous communi-cation between the laboratory and the clinical team.

Pharmacokinetics and Pharmacodynamics of antimicrobials in sepsis

Prof. Priyadarshani Galappatthy

Antimicrobial therapy for the treatment of sepsis requires not only appropriate choice of agents but also appropriate dosing strategy, which needs consideration of changes in pharmacokinetics (PK) and pharmacodynamic (PD) during sepsis. Dose optimization requires considering physicochemical properties of antimicrobials, their PD parameters, PK alterations in sepsis, and minimum inhibitory concentrations (MICs) of pathogenic organisms.

Antimicrobial agents are classified into hydrophilic or lipophilic agents according to physicochemical properties. Significant increase in volume of distribution (Vd) of hydrophilic antimicrobials occurs in patients with sepsis, due to capillary leak, administration of large volumes of resuscitation fluids, hypoalbuminemia, fluid retention in body cavities, and extracorporeal circuits. Renal clearance of hydrophilic antimicrobials is significantly altered in patients with sepsis. Both increased or decreased renal clearance of antimicrobials can occur. However, regardless of renal function, hydrophilic antimicrobials, having increased Vd, generally require a loading dose in patients with sepsis.

Lipophilic antimicrobials may experience decreased clearance in patients with liver failure and increased Vd if patients are on Extracorporeal Membrane Oxygenation (ECMO).

Extended/continuous infusion of β-lactams should be considered for the treatment of sepsis,especially in difficult-to-treat infections (e.g. high MIC of pathogens, immuno-compromised patients, and uncontrolled source of infection).

Therapeutic drug monitoring for β-lactams has been increasingly introduced to optimize antimicrobial therapy in ICU. Modification of dosing regimens for commonly used hydrophilic (beta lactams, vancomycin, aminoglycosides, colistin) and lipophilic antimicrobials (quinolone, linezolid) and antifungal agents will be discussed.

Immunotherapy and sepsis: current landscape and future advances

Prof. Suranjith Seneviratne

Sepsis is an important cause of morbidity and mortality, worldwide. During the last century, antibiotic therapy and supportive care significantly improved patient survival following sepsis. However, many immuno-therapy trials for sepsis, done in the 1990s and 2000s, largely failed. This was at least partially due heterogeneity in the underlying immune dysfunction, among the patients who were included in these trials. Technological developments (based on omics-based technologies and systems medicine) made during the past decade, show promise in overcoming the previous hurdles. They have allowed the 'immune-endotypes' of sepsis to be described in greater depth and hence opened up new avenues in precision medicine approaches to sepsis management. Such approach's should increase the potential for establishing immunotherapy as a successful pillar in the treatment of sepsis in the future. My talk would outline the immunological rationale for considering Immunotherapy for sepsis and discuss its current status and future potential.

Plenary Presentations

Plenary 1

Urology in UTI: Prevention management and improving patient quality of life

Dr. Manjula Wijewardena

Urology is the surgical specialty in facilitating urine storage and flow. Broadly, Urologists are involved in prevention and management of UTI in their day-to-day surgical practice. The best urological surgical practices attempt to minimize bacterial contamination of the urinary tract as a result of the operation. Prophylactic antibiotic use is vital in most situations to achieve this goal.

In cases of asymptomatic bacteriuria (ABU) knowledge gaps exist in how best to execute the operations with least infective complications to the patient. Although eradication of bacterial carriage prior to some operations like TURP is vital, the guidelines in screening for ABU and pretreatment principles are not cut and dry as the effect of bacterial carriage may be of benefit in some cases.

In certain urological infections surgical interventions are paramount for minimizing acute kidney injury and mortality. Pyonephrosis, emphysematous pyelone phritis and Fournier's gangrene are classic examples. Infected prosthesis and xanthogranulomatous pyelonephritis are rare infective conditions where surgery plays an important role in recovery.

Although catheter associated urinary tract infection is a scourge in ICU and long stay resident facilities. Apart from early removal of catheter, urology has no specific interventions. In this instance good nursing practices in catheter care are vital.

Plenary 2

Cytokines and infections: friends or foe?

Prof. Suranjith Seneviratne

Cytokines are small proteins released by a range of cells, including cells of the immune system, where they coordinate the body's response against infection and trigger inflammation. Having the right amount of cytokines, that are able to signal correctly, are essential for having a healthy immune system. High levels of cytokines or cytokine storms, may lead to excessive inflammation and organ/tissue damage. My talk would discuss the spectrum of infections and clinical disorders caused by inadequate amounts of cytokines and how they may be diagnosed and managed. At the other end of the spectrum, the clinical characteristics of cytokine storms and how these may be prevented and treated would be discussed.

Plenary 5

Antifungal stewardship in resource limited setting

Dr. Arunaloke Chakrabarti

Antifungal Stewardship (AFS) refers to careful and responsible management of fungal infections. The majority of AFS programs are included under general Antimicrobial Stewardship Programs (ASP), but AFS requires special attention as patients at risk for fungal infections are substantially different, empiric antifungal use is common due to limitation of diagnosis, standardization of antifungal susceptibility test is still evolving, complexity and expertise required to evaluate appropriateness of antifungal use.

Two systematic reviews have claimed better outcome of the patients after implementation of AFS. However, the implementation of AFS in resource limiting settings is not easy due to lack of political commitment of management in the area of fungal diseases, inadequate funding, compromise in infection control due to overcrowded healthcare, lax regulatory framework, non-uniform access to fungal diagnostics, limited knowledge and access to quality antifungal agents, absence of inhouse pharmacy and shortage trained manpower. To implement AFS in this resource limiting settings one requires innovative ideas and better resource mobilisation. Certain action plans may be recommended in this challenged scenario: implementation of 'trained the trainers' program and development of network of expert clinicians, teleconsultation from those experts to overcome shortage of trained staff, motivation to develop local epide-miology data on pathogen and susceptibility for evidence-based implementable guideline, adherence to bundle of care to specific fungal infections, incorporation of point-of-care tests.

Plenary 7

Role of antimicrobial consumption and antimicrobial use parameters for an effective antimicrobial stewardship Programme

Prof. Shalini Sri Ranganathan

Stewardship means careful and responsible management of something entrusted to one's care. When it comes to antimicrobial stewardship (AMS) programmes, it is the careful and responsible management of antimicrobials as the causal association between the use and resistance is well documented. Recognizing its importance, the World Health Organization (WHO) incorporated AMS programmes into the global action plan on antimicrobial resistance (GAP- AMR). Antimicrobial stewardship programmes are recommended as one strategy to achieve the fourth objective of GAP-AMR, viz to “Optimize the use of antimicrobial medicines in human and animal health. The stewardship programmes are expected to monitor and promote approp-riate use of antimicrobials both at local and national levels. Monitoring cannot be done blindly. It needs data. Antimicrobial consumption (AMC) and antimicrobial use (AMU) are recommended by the WHO as two reliable data to monitor use of antimicrobials. The WHO methodology for a global programme on surveillance of antimicrobial consumption recommends that countries separate “consumption data” from “use data” as the objectives, methods and outcomes for these two categories of data are different. “Consumption data” refers to estimates derived from aggregated data, mainly derived from import, sales or reimbursement databases whereas “use data” refers to estimates derived from patient-level. Although identified as the main culprit for the increase in global consumption of anti-microbial, both overall as well as disproportionate increase in watch category antibacterials, many lower middle-income countries have not established surveillance programmes for AMC and AMU. This has to be urgently addressed.

Symposium 1

Laboratory Detection of drug resistant mechanisms in MDR organisms: Conventional to advanced methods

Dr. Deborah Pakshmala Gnanarajah

Antimicrobial resistance (AMR) has dramatically increased worldwide despite the enormous advancement in medical technology & services. World could return to a pre antibiotic era with multi drug resistant (MDR) infections with nearly 10 million deaths by 2050.

Rapid detection and characterization of antibiotic resistance with reliable techniques play an essential role in treatment and controlling further spread. No consensus has yet been reached with regards to a single optimal method.

Detection of drug resistant mechanisms in Gram-negative bacteria has evolved significantly with modern methods (PCR, qPCR, RT-PCR, Multiplex PCR, RAPD, RFLP PCR, LAMP, Micro array assay, WGS, NGS, RNA sequencing) Offering enhanced speed, accuracy, and comprehensiveness.

Conventional methods (AST, 5-disc, e-Test, MHT, multi disc diffusion test, CARBA NP, CIM) remain important in many clinical settings due to the cost effectiveness and simplicity and accessibility with degree of accuracy.

Integrating modern techniques can significantly improve the clinical management of patients and control the spread of antibiotic resistance.

WGS is expensive and needs an automated data interpretation system and publicly available databases for wider use. It would be a powerful tool for molecular characterisation of antibiotic resistant genes and outbreak investigations in the near future.

Control the spread of multi drug resistant *Acinetobacter* in Intensive Care Units: A Multifaceted Approach

Prof. Dale Fisher

Acinetobacter species, rarely colonises non-hospitalised patients but when transmitted to the vulnerable in hospital for instance those intubated in ICUs can colonise and cause disease. It is a resilient organism. While being hydrophilic it can survive desiccation being potentially found on dry hospital surfaces for months. It can grow at a variety of temperatures and pH values. Sources of colonisation, infection or outbreaks with multi drug resistant Acinetobacter include the hands of hospital staff as well as myriad environmental sources such as respiratory therapy and other equipment, infusion pumps, bed curtains and other fomites, tap water, soap dispensers, irrigation solutions and sink traps. Increasing the risk is the difficulty in control and treatment due to drug resistance and the formation of biofilms.

Control of *A. baumannii* transmission is non-specific but cases and outbreaks require strict implementation of IPC protocols including standard and contact precautions, environmental cleaning and disinfection, surveillance, training and monitoring of processes plus antimicrobial stewardship. In an outbreak, identifying the source will help considerably, together with heightened environmental cleaning, which may require unit closure.

Symposium 2

Infection prevention and control: Before, during and after the pandemic

Prof. Dale Fisher

IPC activities were founded on transmission-based precautions and the core components with implementation through trained practitioners via multimodal strategies. Guidelines are developed across different healthcare settings, standards are set and tools created for audits and benchmarking. IPC teams are generally institution based and do not perform outside. Surveillance and other processes are manual in most settings.

During the pandemic the importance of ventilation was highlighted and evidence emerged that droplet compared with airborne spread was not binary. IPC practitioners had to adapt policies and processes. Isolation rooms saw MDRO patients displaced leading to an increase in their transmission. Mask wearing was standard in an attempt to curb hospital outbreaks of COVID-19. Many IPC practitioners directed their efforts outside of hospitals, to advise on respiratory protection; nursing homes, dormitories, hotels and makeshift facilities.

Post pandemic and moving forward ventilation of patient care areas needs to be better planned and monitored. Infrastructure planning must also enable adaptation during future pandemics. Information technology needs to better support data management, while other advancements in devices and cleaning technology could add to IPC effectiveness. IPC as a system could be better integrated to clinical teams and even beyond the hospital.

Automation and artificial intelligence including data analytics could help outbreak management and help assess risk of individuals and populations. From this it could be anticipated that more tailored IPC activities are feasible, empowering patients and their families to be greater role players in a future system of IPC.

Symposium 3

Halt the Spread of MDR TB in Hospital Settings: Applying Engineering Principles for Isolation rooms

Prof. Terrence Rohan Chinniah

Cornerstone in the prevention of airborne infections requires buildings built specifically with the purpose to preventing the spread of airborne pathogens. This is achieved by placing the patients in isolations rooms.

Isolation of a patient is done for the purpose of source isolation or protective isolation. Hence the need of negative pressure isolation rooms or positive pressure isolation rooms, known as Airborne Infection Isolation room (AII room) or Protective Environment room (PE room) respectively.

To achieve this, the isolation rooms should be purpose built with ante-rooms, air seal doors and ventilation system with predetermined in-flow and exit air vents, airflow direction and air exchange rate.

These parameters should be routinely monitored by in-built monitors and frequent, pre-scheduled manual checks. If these rooms are supplied with filtered air maintenance and checking of the filters, namely HEPA filters is essential.

All these will be necessary to prevent the spread of infections, namely Airborne infections, specifically tuberculosis as *Mycobacterium* tuberculosis is an airborne pathogen.

Hence a basic knowledge, in the engineering aspects of isolation rooms is crucial for Clinical Microbiologists and Infection Preventionists.

Case based discussion on difficult to manage infections

Prof. Panduka Karunanayake and
Dr. Geethika Patabendige

The spectrum of microorganisms causing invasive infections and sepsis has been changing markedly over the last decades. Difficult to manage infections caused by them pose a formidable challenge for healthcare providers and represent a growing global health issue. It is evident that many patient, antimicrobial and microorganism related factors contribute to this situation which is associated with increased morbidity and mortality.

However, a multidisciplinary approach, implementation of antimicrobial stewardship and timely interventions would optimize the management leading to favorable outcomes. Implementation of infection prevention and control strategies are essential to fight the spread of multidrug resistant organisms because every infection prevented, reduces the need for and use of antimicrobials.

In this panel discussion two difficult to manage infections will be discussed paying attention to diagnostic and therapeutic challenges faced in the local context.

Expert Panel discussion Rational use of microbiology together, for better patient care

Prof. Ishan De Soyza
Dr. Upul Dissanayeke
Dr. Deepal Perera
Dr. Kushlani Jayatilleke

Diagnostic stewardship, coordinated guidance, and interventions to improve the appropriate use of microbiological diagnostics to guide therapeutic decisions are crucial for optimizing patient care and resource utilization. Effective stewardship ensures accurate diagnoses, timely treatments, and the avoidance of unnecessary tests, thus improving overall healthcare outcomes.

Microbiology tests are invaluable across different medical disciplines. In infectious diseases, they pinpoint the causative agents, enabling targeted therapy and reducing the misuse of broad-spectrum antibiotics. In critical care, rapid pathogen identification can be lifesaving, while in pediatrics and surgery, timely and accurate diagnoses prevent complications and guide appropriate interventions. Public health also benefits significantly through surveillance and outbreak management.

Clinicians are essential in the pre-analytical phase to improve diagnostic stewardship. They must select tests judiciously, based on clinical guidelines and patient presentations, and ensure proper sample collection and transport to avoid contamination and degradation. Providing comprehensive clinical information on test request forms and preparing patients appropriately for sample collection further enhances test accuracy and reliability.

Interpreting microbiology test results requires an understanding of specimen types, test limitations, and correlation with patient characteristics and clinical findings. It is important to be cautious of interpreting results, and consulting with microbiologists when necessary to ensure appropriate use of antimicrobials.

In conclusion, diagnostic stewardship and the rational use of microbiology tests are pivotal in enhancing patient care and reducing healthcare costs. By collaborating effectively, clinicians and laboratory professionals can ensure accurate diagnoses, timely treatments, and optimal patient outcomes.

OP 1

Association of *Staphylococcus aureus* bacteriuria with *Staphylococcus aureus* bacteremia as an indicator of the prognosis of infection

Madumali DI[1], Piyasiri DLB[1]
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Galle, Sri Lanka.

Introduction
Staphylococcus aureus blood stream infection (SABI) is a frequent finding with a high morbidity and mortality in hospitals. However, identifying patients prone to complications and poor prognosis early remains challenging. *Staphylococcus aureus* bacteriuria (SABU) is a rare occurrence indicating asymptomatic colonization, catheter associated urinary tract infection or hematogenous spread in patients with SABI. While some studies suggest SABU as a prognostic indicator for SABI, further research is needed for confirmation.

Objectives
The study aimed to detect the incidence of SABU in patients with SABI and to compare the prognosis of SABI associated with bacteriuria and without bacteriuria.

Design, setting and methods
A cross-sectional study with follow up was performed at a tertiary care hospital among inpatients for 4 months. That included 73 patients with at least one clinically significant *Staphylococcus aureus* blood culture, with two urine cultures collected from each within 72 hours of blood culture positivity. All samples were processed according to standard operating procedure with enrichment of the culture-negative urine samples. Isolates were included based on matching colony morphology, biochemical tests, and ABST with 100% agreement. All patients were followed for at least 2 weeks to assess complications and in-hospital mortality.

Results
Among 73 SABI cases, 50.7% were MSSA, and the rest were MRSA. Urine samples were midstream (63%), catheterized (35.6%) and suprapubic (1.4%). Detection of concurrent SABU was 15.1% while in-hospital mortality was 24.7%. Univariate analysis showed that patients with SABU had significantly higher occurrences of septic shock ($p = 0.011$, OR= 6.240) and in-hospital mortality ($p = 0.022$, OR=5.000) than those with SABI alone. SABU was significantly associated with prior urological procedures ($p=0.021$) and community-onset SABI ($p=0.030$), while the presence of a urinary catheter showed no significant association ($p=1.000$). Patients with concurrent SABU had a greater probability of death than those with SABI alone, according to the univariate survival curve (Kaplan–Meier).

Conclusion
SABU is a useful predictive indicator for in-hospital mortality among patients with SABI. This implies that patients with SABU may benefit from more intensive treatment approaches.

OP 2

Study on gut colonisation of carbapenemase producing organisms among patients with haematological malignancies in National Cancer Institute, Sri Lanka

Dissanayake Y[1], Dissanayake DMBT[2], Gunasekara SP[1]

[1]Department of Microbiology, National Cancer Institute, Maharagama, [2]Department of Microbiology, University of Sri Jayewardenepura

Introduction

Carbapenemase-producing organisms (CPO) are the most critical group of multi-drug resistant bacteria, posing the greatest threat to human health. Addressing this issue is the top priority of the WHO to combat global antimicrobial resistance. Local data regarding this risk is essential in uplifting the patient care and health services of the country.

Objectives

This study aimed to determine the prevalence of gut-colonisation of CPO among patients with haematological malignancies as this group has a higher risk of serious infections. Further, their antibiotic sensitivity patterns, co-colonisation status and selected factors associated with gut-colonisation were evaluated.

Design, setting and methods

A descriptive cross-sectional study was conducted over a four-month period in National Cancer Institute, Sri Lanka in 2019/2020. Rectal swabs from consenting adult in-ward patients were inoculated on a selective chromogenic agar medium to isolate CPO. Species identification and antibiotic sensitivity were performed by VITEK®2 system. Data on associated factors of CPO-colonization were collected using an interviewer-administered questionnaire and a data collection sheet.

Results

Among 264 patients, the prevalence of CPO gut-colonisation was 38.2% (101/264). Co-colonisation with two or more CPO was detected in 14.4% (38/264). The total number of CPO isolates was 145. Klebsiella pneumoniae was the predominant carbapenemase producer (48.3%, 70/145). Most isolates (139 out of 145 CPO isolated from chromogenic agar) were resistant to at least one carbapenem (95.9%,139/145). Resistance rates for piperacillintazobactam and tigecycline were 96.5% and 66.2% respectively. Lowest resistance was detected for colistin (0.02%). Age<55 years, receiving carbapenems, aminoglycosides or chemotherapy, being neutropenic in previous six months and being diagnosed with malignancy for <3 months were significantly associated with CPO gut-colonisation ($p<0.05$).

Conclusions

A high prevalence of CPO gut-colonisation is seen in the study population with some being co-colonised with more than one CPO. Resistance to other commonly used antibiotics is high among CPO. Recognized associated factors with CPO gut-colonisation can be useful in early identification of patients with high risk of CPO-colonisation and infection control interventions.

Acknowledgement:

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OP 3

Prevalence of antimicrobial resistance in natural water bodies of Gampaha district

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Introduction

Antimicrobial resistance (AMR) is a global health crisis. Water resources are recognized as the primary environmental reservoir and dissemination of AMR. Therefore, surveillance of AMR in water bodies is important to determine the extent of contamination with AMR.

Objective

Determine the extent of contamination of natural water bodies of Gampaha District with resistant Escherichia coli.

Design, setting and methods

This descriptive cross-sectional study was carried out from November 2023 to February 2024. Samples were collected from 52 major natural water bodies (tanks, rivers etc.) in Gampaha district (Department of Census and Statistics and from google maps). Two samples, (500m apart) from each source were collected aseptically (locations where people access the sources), transported in ice and processed according to standard single membrane filtration method using nitrocellulose membranes. They were inoculated onto membrane lactose glucuronide agar which differentiates *E.coli* colonies from other coliforms. *E.coli* colonies were further confirmed biochemically and antibiotic susceptibility tests were performed by disc diffusion method according to CLSI standards. In case an organism had a similar ABST pattern from the same source, one isolate was used for analysis.

Results

E.coli contamination of natural water bodies in Gampaha district was 100%. There were 93 isolates of *E.coli* from 104 samples collected from 52 sites.

Coliform count was >200 CFU in 100% of the sites and 68.2% of sites had >200 CFU of *E.coli.*

Among the *E.coli* isolates, 19% were resistant to 3 or more antibiotic classes (MDR), and 65% were non susceptible to at least 1 antibiotic tested. The non-susceptible rates to individual antibiotics are: ampicillin 53%, co-amoxiclav 19%, gentamicin 18%, tetracycline 15%, ciprofloxacin14%, trimethoprim / sulfamethoxazole 10%, cefotaxime 9%, ceftazidime 9%, and chloramphenicol 2%. All isolates were sensitive to ertapenem.

ESBL was detected in 5 isolates (5.3%). Amp-C beta-lactamase producers were not detected.

Conclusion

Our findings show a high prevalence of AMR in natural water bodies which are accessed by humans for daily needs. This is a health threat with high morbidity and mortality. An island-wide surveillance of AMR in environmental sources is warranted to determine the extent of AMR pollution of the environment.

OP 4

Strongyloidiasis among primary school children in Anuradhapura district, Sri Lanka

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Introduction

Strongyloidiasis is an intestinal parasitic infection caused by the nematode *Strongyloides stercoralis.* This neglected tropical disease poses significant health risks, particularly in regions with poor sanitation and hygiene. Research on strongyloidiasis in Sri Lanka is limited, with none from Anuradhapura. The most recent study conducted in Rathnapura in 2006 revealed a prevalence of 0.9% among primary school children using agar plate culture (APC).

Objectives

This study aimed to estimate the prevalence of strongyloidiasis among primary schoolchildren in Anuradhapura district.

Design, setting and methods

This cross-sectional study collected stool and Scotch tape samples from 633 students in grades 1-5, using multistage stratified cluster sampling from 18 schools across all five educational zones in Anuradhapura district. Stool samples were analyzed in triplicates using four techniques: APC, direct wet smear (DWS), formol-ether concentration (FECT), and Kato-Katz (KK). Larvae were morphologically identified and differentiated using FECT and APC.

Results

The participants' mean age was 7.9 ± 1.9 years, with 342(54%) females. Of the participants, 32(5.0%) tested positive for S. stercoralis infection, and all of those infected were asymptomatic, with 17(53.1%) being female. Schoolchildren aged 5–7 years were 3.2 times more likely to have strongyloidiasis infection compared to the 8–10 year-olds (p-value <0.001, odds ratio=3.20). Co-infections with hookworm, *Ascaris lumbricoides, and Enterobius vermicularis* were observed as 1(3.1%), 3(9.3%), and 3(9.3%) respectively, and none with *Trichuris trichiura.* The prevalence of *S. stercoralis* was 0% with DWS and KK, 8(1.2%) with FECT and 32(5.0%) with APC techniques. Of the positive participants, 25(78.1%) had received deworming medication within the last 6 months of data collection. None of the infected children exhibited immuno-compromised conditions or were on immuno-suppressants.

Conclusion

The study uncovered a significant prevalence of strongyloidiasis (5%) among primary school children in the Anuradhapura district. This sharply contrasts with the cumulative prevalence of soil-transmitted helminth infections, which stood at 0.21% within the same district, as revealed by the islandwide survey conducted in 2017. APC was the most sensitive method for detecting strongyloidiasis. These findings highlight the necessity for prioritizing future studies on strongyloidiasis.

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OP 5

Identification of *Cryptococcus* species and their antifungal susceptibilities, including synergistic combinations

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Introduction

Cryptococcal meningoencephalitis, a severe systemic mycosis, is frequently caused by either *C.neoformans var neoformans or C.neoformans var gattii* which show differences in ecology, virulence, and antifungal sensitivity. The differentiation of two verities and evaluation of antifungal sensitivity have epidemiological and clinical relevance.

Objectives

To determine the variety distribution and antifungal sensitivity of *Cryptococcus* species isolated at the Department of Mycology from clinical specimens.

Design, setting and methods

Twenty-six *Cryptococcus* sp. isolated at the Department of Mycology from 2013 to 2020 were subjected to phenotypic identification (colony morphology, microscopy, biochemical tests, Cryptococcal differential media) and antifungal sensitivity testing by the E strip method (amphotericin B, flucytosine, voriconazole, itraconazole, fluconazole). The antifungal synergy of voriconazole, fluconazole, and flucytosine with amphotericin B was evaluated (The E test strips were placed on the Mueller-Hinton agar in a cross formation, with a 90° angle at the intersection. Synergy results were determined according to the calculated fractional inhibitory concentration index).

Results

Cryptococcus spp. were isolated from blood (n=13), CSF (n=12), and biopsy (n=1) specimens, and the patient's mean age was 38.5 years. Most of the patients were males (91%). *C. neoformans var neoformans* accounted for 100% of the isolates. Thirty-eight percent, 11.53%, and 3.80% of isolates had minimum inhibitory concentration (MIC) above epidemiological cut-off values (ECVs) for amphotericin B, itraconazole, and voriconazole respectively. The majority of antifungal combinations were indifferent. The synergy between amphotericin B-flucytosine, amphotericin B-voriconazole, and amphotericin B-fluconazole was 34.61%, 26.92%, and 15.38% respectively.

Conclusions

The presence of isolates with MIC above ECVs suggests that those isolates may have an acquired mechanism of resistance. Thus, identification and antifungal sensitivity testing might be advantageous for the management of patients. A limited tested number of isolates warrants further comparison of the E-test synergy technique with other methods.

PP 1

Association of diabetes mellitus with the disease entity and clinical parameters in culture positive melioidosis

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Introduction
Melioidosis is a multi-system infection caused by *Burkholderia pseudomallei,* a bacterium living in soil which is transmitted to humans through inoculation, inhalation or ingestion. According to numerous studies, diabetes mellitus (DM) is the major risk factor, not only predisposing to melioidosis but also altering the immune response to the infection.

Objectives
To analyse the prevalence of DM among a local cohort of culture positive melioidosis patients and to describe the association of DM with the disease entity and clinical parameters.

Design, setting and methods
Anonymised data of 83 culture positive melioidosis patients from December 2014 to February 2024 were accessed to analyse disease entities, risk factors and laboratory investigations on admission. Fisher's exact test was used to determine any statistical association between variables and a p value of less than 0.05 was taken as significant.

Results
Among 83 patients, 59 (71.1%) were diabetics. Among females 100% (9) of >60yrs and 70% (7) of 40-60yrs, and 88% (28) males of 40-60 yrs were diabetics. There were patients with abscesses including deep seated ones (35, 42%), pneumonia (17, 21%), septic arthritis (7, 9%), pyelonephritis (6, 7%) and other entities (18, 22%) including rare ones like endocarditis (2, 2%). Mortality rate was 18/83 (22%) of which 13 (72%) were DM.

There was a significant association between abscesses/pus formation and the presence of DM (p=0.0016). Melioidosis antibody titre was tested in 64 (77%) and there was a highly significant association of high titres >1:160 with the presence of DM (p=0.0004). Associations of white cell count (WCC) >11,000/µL, and ESR >100 mm/1st hr with DM were statistically significant (p=0.0219 and p=0.0305 respectively). Association of high platelet counts (>400,000/µL) with DM was not statistically significant (p=0.19750).

Conclusions
The prevalence of diabetes in this melioidosis cohort was 71%. Association between abscess formation and diabetes was statistically significant. The presence of DM is associated with higher antibody titres, high ESR and high WCC which may indicate more chronic or extensive disease.

PP 2

Prevalence and predictors of MRSA colonization among healthcare workers in surgical and special units in a tertiary care hospital in the Western Province of Sri Lanka

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Introduction
Methicillin resistant Staphylococcus aureus (MRSA) colonization rates may be high among healthcare workers (HCWs), and this poses a risk of infection transmission to patients in surgical and special-units. Local data with regards to MRSA colonization among HCWs is limited.

Objectives
The study aimed to determine the prevalence of MRSA nasal colonization of HCWs in surgical and special units at a Teaching Hospital, to determine the factors associated with colonization and to determine whether colonization is higher among HCWs in units with a high prevalence of MRSA in patients.

Design, setting and methods
Nasal swabs of 180 HCWs were obtained and inoculated onto MRSA CHROMagar™ and blood agar. MRSA colonies appeared light green on MRSA CHROMagar™. Likely colonies of *Staphylococcus* spp were identified (Gram stain, catalase test, slide and tube coagulase). Antibiotic susceptibility testing was performed using 30µg cefoxitin discs. Light green colonies on chrome agar were confirmed as MRSA by the cefoxitin resistance. The associated factors for colonization were collected using an interviewer-based questionnaire. Retrospective data from Microbiology laboratory records on culture isolation of MRSA in all patients' samples from each special unit/surgical ward received during preceding 6 months of the study period was analysed.

Results
Of the 180 HCWs, *Staphylococcus aureus* was identified among 18 HCWs amounting to 10% (18/180) in all units. Out of them 44.4% (8/18) were identified as MRSA. The overall prevalence of MRSA nasal carriage among HCWs was 4.44% (8/180). MRSA colonization was 3.3% (3/90) in special units and 5.5% (5/90) in surgical wards. There was no statistical significance between MRSA colonisation and any associated factors studied (exposure to antibiotics within the last six months, hospital admission within the last year, surgical intervention within the last six months, suffering from chronic sinusitis, chronic wounds, and chronic skin conditions). There was no significant association between MRSA isolation in patients' samples and MRSA colonisation in HCWs in each unit.

Conclusion
The overall prevalence of MRSA nasal carriage among HCWs in surgical and special units at this Tertiary Care Hospital was 4.44%.

PP 3

Point prevalence survey on usage of antibiotic prophylaxis in surgical wards in Colombo North Teaching Hospital

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Introduction
Surgical antibiotic prophylaxis (SAP) for clean-contaminated, contaminated and implant surgeries is considered to be a standard practice to prevent surgical site infections. The optimal use of SAP depends on administering the correct antibiotic in the correct dose, using the correct route for recommended duration according to evidence-based guidelines. Although current guidelines recommend a maximum duration of 24 hours postoperatively, SAP is continued beyond this period in many situations. As this practice can promote development of antimicrobial resistance, it is an important aspect to be addressed in antimicrobial stewardship programs.

Objectives
To determine the level of adherence to national antibiotic guidelines in administering surgical antibiotic prophylaxis.

Design, setting and methods
This study was conducted as a point prevalence survey which included all surgical wards in Colombo North Teaching Hospital, Ragama on a single day. All patients who had undergone routine surgical procedures by 8.00 a.m. on the day the surveillance was included in the study and the patients who had been re-admitted due to surgical site infections and the patients who were awaiting surgery were excluded. Data was collected using a google form questionnaire based on WHO PPS methodology and data analysis was done using Excel 2019.

Results
There were 78 patients who had undergone routine surgeries and 75 patients were given prophylactic antibiotics. Clean contaminated and contaminated surgeries accounted for 35.9%. The compliance on selection of an antimicrobial agent according to the national antibiotic guideline, as surgical prophylaxis was 34.6%. On 56.4% occasions, prophylactic antibiotics were continued beyond 24 hours. Highest rates of continuation of SAP was observed in patients undergoing vascular surgeries (100%) followed by obstetrics and gynaecological surgeries (71.4%).

Conclusion
Surgical antibiotic prophylaxis usage was inappropriate with regard to the selection of appropriate antibiotic and duration in Colombo North Teaching Hospital. Urgent measures are needed to optimize SAP and to increase adherence to the national guidelines which will have a great impact on preventing develop-ment of antimicrobial resistance.

PP 4

Prevalence of community-acquired MRSA nasal colonization in outpatients in a tertiary care hospital and antibiotic susceptibility of the isolates.

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Introduction
The incidence of community acquired *Staphylococcus aureus* (SA) infections shows an upward trend. Occurrences of resistance to methicillin and second-line antibiotics indicate the need for periodic reassessment of anti-biotic susceptibility profiles. Clindamycin is prescribed empirically or used as a treatment for Staphylococcal infections when the isolates are methicillin-resistant (MRSA) and when patients have beta-lactam antibiotic allergy.

Objectives
The study aimed to determine the prevalence of nasal *Staphylococcus aureus* carriage in the community, to detect the rates of resistance to methicillin and second-line antibiotics and to assess the rate of inducible resistance to clindamycin.

Design, setting and methods
A descriptive cross-sectional study was carried out from November 2023 to February 2024, at the outpatient department of Colombo North Teaching Hospital to evaluate the prevalence of nasal *Staphylococcus aureus* colonization rates in the community by performing nasal swab cultures. Consenting patients above 18 years, who are not critically ill and without known risk factors for MRSA colonization were recruited consecutively. Antibiotic suscepti-bility profiles were detected according to the CLSI guidelines 2023. Inducible clindamycin resistance was demonstrated by the D zone test.

Results
A total of 207 people were screened, and *Staphylococcus aureus* nasal colonization was noted in 34 (16%) of participants. Seventeen isolates were resistant to cefoxitin, with an MRSA nasal colonization prevalence of 8%. Erythromycin non-susceptibility rate was 79% (27/34), and inducible clindamycin resistance was noted in 9 (26%) isolates. Twenty-seven (79%) isolates were non-susceptible to ciprofloxacin. All isolates were susceptible to trimethoprim-sulfamethoxazole, linezolid, rifampin, and vancomycin.

Conclusion
No significant increase was noted in the MRSA colonization rate compared to previously stated rates (6%) in the country. Prescribing clindamycin for patients with beta-lactam allergy, and as an empirical treatment to achieve MRSA coverage, can be associated with a 26% failure rate. Thus, the recommendation of clindamycin as the second-line antibiotic of choice for surgical prophylaxis needs to be reassessed. The reported high erythromycin and ciprofloxacin non-susceptibility rates indicate the need for an Island-wide study on the antibiotic susceptibility pattern of *Staphylococcus aureus.*

PP 5

Identification of Shiga Toxin producing *Escherichia coli* in children with diarrhoea in a tertiary care pediatric hospital in Sri Lanka

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Introduction
Shiga toxin-producing *Escherichia coli* (STEC) are zoonotic bacteria that live in the intestine of cattle. It is known to transmit via food and water to humans and leads to a range of diseases in humans; from self-resolving diarrhea to potentially fatal hemolytic uremic syndrome. STEC has been discovered in food and cattle faeces in Sri Lanka, but there are no studies on the incidence of STEC including E. coli O157 in humans or children with diarrhea in Sri Lanka.

Objectives
To identify STEC and describe the socio-demographic factors in children with diarrhea due to STEC, attending the Lady Ridgeway Hospital for Children (LRH), Colombo.

Design, setting and methods
A descriptive cross-sectional study was carried out over four months' period from 1st December 2017 to 31st March 2018. Study population was 210 patients with acute diarrhoea attending LRH. Stool culture and serotyping was performed for *E. coli* O157, O1, O26, O111, O124, O136, O143, O152 and O164. Sociodemographic and clinical data were collected using an interviewer administered questionnaire. Exposure to risk factors of STEC infections (eg: contact of cattle, consumption of undercooked beef, raw milk etc) were inquired. Data analysis was done using SPSS (version 22).

Results
Mean age of the study population was 2.7 years. Ten percent had bloody diarrhea. *E. coli* O1 was detected in six patients (2.8%). It was significantly associated with international travel (p=0.03). Bloody diarrhea, beef consumption, presence of pus cells or red cells in stool were not significantly associated with detection of *E.coli* O1. All the patients recovered without complications. *E.coli* O157 and other STEC serotypes were not detected.

Conclusion
E. coli O1 STEC serotype was detected in 2.8% of children with diarrhea *E. coli* O157, O26, O111, O124, O136, O143, O152 and O164 serotypes were not detected. Travel outside the country was significantly associated with STEC infection. To further assess the situation of STEC in Sri Lanka, a study in a larger population, including a farming population is recommended.

PP 6

Two-year analysis of respiratory viruses in acute infections: Insights from a National Laboratory

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Introduction

Respiratory viral infections cause significant morbidity and mortality worldwide especially in children, pregnant mothers, and elderly. Multiplex PCR offers a suitable method to detect these viruses.

Objectives

To determine the positivity rates of respiratory viruses and assess association between demographic details and clinical symptoms with laboratory results.

Design, setting and methods

Retrospective study was conducted with selected samples from patients suspected to have acute respiratory infections, sent from all over the country between February 2022 to February 2024. Demographic and clinical data was collected from the laboratory information management system and request forms. A total of 131 samples were tested, using FastTrack and CDC multiplex PCR assays, for influenza A (INFA), influenza B (INFB), SARS-CoV-2, adenovirus (Adv), respiratory syncytial virus (RSV), parainfluenza 1-4 (PIV), human coronavirus (HCoV), human metapneum-ovirus (HMPV), and rhinovirus (RV). Association between categorical variables was tested using Chi-square test.

Results

Study population ranged from newborn to 81 years with a mean age of 15 years. There were 69 (52.6%) males. Respiratory viruses were detected in 63 samples (48.7%) with two viruses detected in 6 samples (4.6%). Total viruses detected were as follows: RV: 14.5%, Adv: 13%, HMPV: 8.7%, PIV: 7.2%, INFA: 4.3%, INFB: 1.4%, HCoV: 1.4%, SARS-CoV-2 (0). Among the 63 positives, predominant virus changed in different groups: RV (17.5%) and HMPV (6.3%) in ICU patients (n=19), Adv (23.8%) and PIV (14.3%) in the 44 in-patients, RV (19%) and Adv (15.9%) with LRT symptoms (n=37), Adv (7.9%), and HMV/INFA/RV (4.8%) with URT symptoms (n=19), RV (10.1%) and Adv (7.2%) in the under 1 years (n=29) and Adv (10.1%) and PIV (8.7%) among the 1-5 year age group (n=32). No significant associations found between positives and demographics or symptoms.

Conclusion

Rhinovirus and adenovirus had the highest positivity rates in this retrospective analysis. However, this may not reflect the prevalence in the general population. RSV, which is known to be prevalent, was not detected. Our findings illustrate the need to expand testing for respiratory pathogens to aid in clinical management and guide preventive measures.

PP 7

Viral aetiological agents and clinical presentations in a respiratory outbreak in Kalawana, Ratnapura district, Sri Lanka, June 2022.

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Introduction
Respiratory infections continue to cause outbreaks in Sri Lanka with significant impact on its healthcare system. Several deaths were reported among elderly patients presenting with respiratory symptoms to the Base Hospital Kalawana in late May, 2022. This study was conducted to determine and report on the viral aetiological agents and the clinical presentations of this respiratory outbreak in Kalawana.

Objective
To determine the viral aetiological agents and clinical presentations of patients presenting with respiratory symptoms to Kalawana Base Hospital during a respiratory outbreak in Kalawana.

Design, setting and methods
This was a hospital based cross-sectional descriptive study conducted at Base Hospital Kalawana and the Medical Research Institute. Data was extracted from clinical records of patients presenting with respiratory symptoms to the medical wards. Nasopharyngeal swabs were tested using RealStar® Influenza A/B/H1 and RealStar® SARS-CoV-2 real-time PCR assays and the Fast-track Diagnostics Respiratory Pathogens multiplex real-time PCR assay that detects influenza A/B, human coronavirus NL63, 229E, OC43, HKU1, parainfluenza virus 1, 2, 3 and 4, human metapneumovirus, respiratory syncytial virus A/B and rhinovirus.

Results
There were 20 patients with a mean age of 61 years (SD±23). 90% (19/20) were females. Cough was the commonest presenting symptom seen in 84% (16/19) while fever was recorded in 54% (10/19). 26% (5/19) of patients presented with dyspnoea while 16% (3/19) had wheezing. The mean duration of symptoms was 6 days (SD±4). Mean C-Reactive protein (CRP) value was 19.8mg/L (SD±42). Mean white blood cell count was 7000/mm3 (SD±3100). Influenza A virus was the most common pathogen detected, seen in 50% (10/20) of the patients. The influenza A subtype detected among influenza positive patients was H3N2. Parainfluenza 4 virus was detected in one patient. The rest of the patients (9/20) had no viral pathogen detected.

Conclusion
Influenza A (subtype H3N2) was found to be the commonest viral pathogen in this respiratory outbreak. Surveillance and reporting of such outbreaks are important to identify epidemiological trends, predict future outbreaks and to implement timely measures for prevention and control.

PP 8

Efficacy of Germ Tube Method in Differentiation of *Candida* Isolates

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Introduction
Candida species have transformed from infrequent pathogens that were mostly regarded as nuisance contaminants to significant and common human pathogens that cause a wide range of superficial and systemic diseases within a few decades. Candidiasis is becoming increasingly prevalent and has a high mortality rate, which can be brought on by a delay in initiating appropriate antifungal treatment. Therefore, rapid and accurate laboratory diagnosis is crucial to provide appropriate antifungal treatment. *C. albicans* can be rapidly differentiated from other Candida species using its germ tube development ability.

Objective
To investigate the efficacy of the germ tube test for differentiating *C.albicans* from non-albicans species.

Design, setting and methods
A total of 220 *Candida* species isolated from oral cavities of cancer patients and healthy individuals were subjected to the study. The basic principle of this presumptive identifi-cation test is *C.albicans* can form a germ tube, a filamentous outgrowth extending from the cell when cultured in human serum at 37° C for two hours which can be easily detected by the compound microscope using a wet mount of the inoculated serum. These results were compared with the identification results obtained from the Biomerieux API 20C Aux yeast identification system.

Results
In this study, 97 isolates were positive for germ tube formation and 123 isolates did not produce germ tubes. API Aux has identified as *C.dubliniensis* six Candida species that produced germ tubes and the rest as *C. albicans.* All the *Candida* non-albicans isolates were confirmed by API 20C Aux.

Conclusion
The germ tube test as a presumptive identifi-cation method of *C. albicans* has an accuracy level of 88%, with *C. dubliniensis* can be misinterpreted by its ability of germ tube formation. In general, both *C. dubliniensis* and *C. albicans* are often susceptible to similar classes of antifungal drugs, such as azoles and echinocandins. However, there are some variations in susceptibility patterns between the two species, and certain strains of *C.dubliniensis* may exhibit reduced susce-ptibility to certain antifungal agents compared to *C. albicans.*

PP 9

Identification and antifungal suscepti-bility pattern of fungi causing keratitis in a local setting.

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Introduction
Fungal keratitis leads to catastrophic visual results if not treated. Early diagnosis and management are essential to prevent long-term complications.

Objectives
Identify the fungal species and the antifungal susceptibility patterns of fungal species isolated from corneal specimens.

Design, setting and methods
Fungi isolated from corneal samples at the Department of Mycology, MRI from 2013 to 2016 were phenotypically identified and the anti-fungal susceptibility testing (voriconazole, itraconazole, and amphotericin B) was evaluated by E strip and disk diffusion methods.

Results
Genus *Fusarium* was the dominant pathogen (57/87, 66%), with *F. solani* complex (55/57, 96.5%), and *F. chlamydosporum* (2/57, 3.5%) being the species. It was followed by the genus *Aspergillus* (26/87, 30%), with the main species of *A. flavus* (22/26, 85%) and *A. fumigatus* (2/26, 8%). *Pythium, Acremonium* (n=1), and *Coelomycetes*(n=1) represented 2%, 1%, and 1% respectively. Ninety-one percent, twenty eight percent and sixteen percent of *Fusarium* isolates had minimum inhibitory concentration (MIC) above epidemiological cut-off values (ECVs) for itraconazole, voriconazole, and amphotericin B respectively. None of the *Aspergillus* isolates showed higher MIC values against itracona-zole and voriconazole. The findings of MICs and inhibitory zone diameter were comparable only for itraconazole (*Aspergillus* sp. and *Fusarium* sp.) and voriconazole *(Aspergillus)*.

Conclusion
Fusarium sp. is the most common pathogen causing fungal keratitis, followed by *Aspergillus* sp. in our study group. A significant number of *Fusarium* isolates had high MIC values. The guidance of antifungal sensitivity testing might be beneficial for the management of fungal keratitis.

PP 10

Antifungal sensitivities of common Mucorales species isolated from sino-nasal specimens in Sri Lanka from 2014 to 2021

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Introduction
Mucormycosis is a deadly fungal infection caused by *Mucorales* group of fungi. Amphotericin B and posaconazole are the main-recommended antifungals. However, susceptibility of *Mucorales* to those agents is not studied in Sri Lanka.

Objectives
Main objective was to describe the anti-fungal susceptibilities of *Mucorales* species isolated from sino-nasal specimens received at the Medical Research Institute from 2014 to 2021.

Design, setting and methods
Retrospective descriptive study was performed with *Mucorales* isolated from sino-nasal specimens received at Department of Mycology, Medical Research Institute from 2014 to 2021. Genus identification was done with morphological features. Broth micro-dilution test was performed for amphotericin B and posaconazole, according to CLSI M38-A2. Clinical and laboratory data were extracted from the records.

Results
There were 158 isolates of *Mucorales*. Mean age of the patients was 56 years and 54% were females. Major risk factor associated was diabetes mellitus, followed by COVID-19 infection.

Commonest pathogen was *Rhizopus* sp. in 154 (97.5%) patients. *Rhizomucor* sp. and *Mucor* sp. were isolated in two patients each (1.2%).

Ninety-three (92%) isolates were susceptible, five (4.9%) were intermediate and three (2.9%) were resistant to Amphotericin B. Eighty-five isolates (84%) were susceptible, thirteen (12.9%) were intermediate and three (2.9%) were resistant to posaconazole. Median of MIC of both amphotericin B and posaconazole was 0.0625. There was no significant difference in MIC values between amphotericin B and posaconazole (P = 0.4355) to Mucorales isolates.

Rhizopus sp is the commonest *Mucorale* that causes human infections worldwide and it is the same in Sri Lanka. Previous studies have shown that the most active antifungal agent against *Mucorales* was amphotericin B followed by posaconazole. High mean MIC of posaconazole in *Rhizopus* spp. is also reported. However, in the current study the MIC of posaconazole was not significantly different from that of amphotericin B.

Conclusions
Amphotericin B and posaconazole are effective and they have comparable MIC on the Mucorales isolated from patients with rhino cerebral mucormycosis in Sri Lanka.

PP 11

Anti-*Candida* activity of Aegle marmelos (Bael) and Munronia pinnata (Ground bitter): A preliminary study

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Introduction

Candidiasis is a common opportunistic infection primarily caused by *Candida albicans.* Recent research studies of resistant *Candida* strains highlight the urgent need for novel antifungal agents, as commonly used antifungals may no longer be effective. Aegle marmelos, a widely used medicinal plant in indigenous medicine, is utilized as an anti-diarrheal, antimicrobial, antiviral, and ulcer-healing agent in traditional medicine. Munronia pinnata has been used since ancient times as a cure for infectious diseases. Previous studies were evident of antibacterial, antiviral and antifungal activity of both plants. The present study aims to investigate the anti-candida activity of Aegle marmelos and Munronia pinnata.

Objectives

To determine the anti-candida activity of the aqueous extracts of dried flowers, roots of Aegle marmelos and the whole plant of Munronia pinnata.

Design, setting and methods

The plants were meticulously collected, authenticated, and decoctions were prepared using the traditional method via reducing eight volumes to one. Decoctions were freeze-dried and used. The macro-dilution method and agar well diffusion method were used to determine the minimum inhibitory concentration (MIC) of *Candida albicans* (ATCC 10231) using a concentration gradient (0.1 – 200 mg/ml) of plant extracts inoculated on potato dextrose broth (PDB) and potato dextrose agar (PDA). Fluconazole was used as the positive control in both methods. All the concentrations of plant extracts used in both methods were tested in triplicates and repeated twice.

Results

As evident from the macro-dilution method, all the tested concentrations of aqueous extracts of plants did not inhibit the growth of *Candida albicans.* There was no zone of inhibition reported in the tested concentrations of aqueous extracts of plant extracts in the well diffusion method. The zone diameter of fluconazole in the well diffusion method ranged from 37 - 45 mm.

Conclusions

Aqueous extracts of dried flowers and roots of Aegle marmelos, the whole plant of Munronia pinnata, did not demonstrate anti-Candida albicans activity in PDA and PDB.

CP 1

Streptococcus pneumoniae meningitis mimicking eclampsia in a 36-year-old pregnant patient: A case report

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Introduction

Streptococcus pneumoniae is a known pathogen causing meningitis, and is the commonest cause of community acquired bacterial meningitis in pregnancy. We report a case of a pregnant patient with pneumococcal meningitis initially presented with features mimicking eclampsia.

Case Report

A 36-year-old patient, previously diagnosed with pregnancy induced hypertension and gestational diabetes mellitus at 3rd trimester of pregnancy, admitted to the obstetric ward at 34 weeks of gestation after being found lying on the floor, unconscious, following one episode of seizure. Upon admission, she was afebrile, with a blood pressure of 185/145 mmHg and capillary blood sugar value of 248 mmol/l. Her GCS was 12/15. Initial assessment suggested eclampsia and the patient was managed accordingly.

She had a history of fever and right ear discharge, 2 days prior to this episode. With this history and poor response to initial treatment, an emergency caesarean section was performed on the patient 7 hours after admission and was transferred to the intensive care unit. Intravenous ceftriaxone and acyclovir were started empirically. An urgent lumbar puncture was performed, and cerebrospinal fluid analysis showed elevated white blood cell count, predominantly neutrophils, and increased protein levels. Gram staining revealed Gram-positive cocci in chains which was later identified *Streptococcus* pneumoniae as the causative agent. Her contrast enhanced CT revealed right mastoiditis, otitis media and focal cerebritis. IV meropenem and IV vancomycin were added after omitting ceftriaxone and acyclovir due to continuous high fever and rising inflammatory markers.

By the eighth day, fever was settled, and her inflammatory markers were normalized, and she was transferred to the post-natal ward.

Discussion

This case highlights the importance of considering meningitis in differential diagnosis when a pregnant patient presents with neurological signs, especially with a history of an ear or a sinus infection which are the commonest infections that predispose to Pneumococcal meningitis. Prompt recognition and intervention in such cases are crucial to improve maternal and fetal outcomes.

CP 2

Poor dental hygiene leading to *Gemella morbillorum* brainabscess : A case report.

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Introduction

Gemella species are facultative anaerobic, catalase negative, gram-positive cocci which are inhabitants in mucous membranes of gastrointestinal, upper respiratory and female genital tract. It mainly causes bacteremia, infective endocarditis and rarely brain abscess. *Gemella morbillorum* brain abscess associated with odontogenic focus is a rare occurrence.

Case Report

A 55-year-old male with a history of epilepsy presented with fever, headache, progressive altered level of consciousness for 1 month. He was febrile, Glasgow Coma Scale 12/15, had left sided upper and lower limb weakness with no autonomic and sensory impairment. He had poor dental hygiene. Investigations include: - white blood cell count 33.3/µL, neutrophils 88%, platelets 467x10^3/µL and hemoglobin 11.9g/L; C-reactive protein 118; ESR 42mm/1st hour; renal and liver functions were normal. Intravenous ceftriaxone 2g 12-hourly was initiated as meningitis was suspected. Non-contrast computed tomography revealed a right frontal space-occupying lesion with cerebral oedema. Magnetic resonance imaging showed a right frontal abscess/cyst. Echocardiogram ruled out vegetations.

On day 2, craniotomy was performed; an abscess with thick pus was drained. After 24-hours of incubation, pus culture grew 0.5-1mm circular, convex colonies with alpha-hemolysis on blood agar with no MacConkey growth and identification was confirmed by automated bioMérieux VITEK-2 as *Gemella morbillorum*. Tuberculosis PCR was negative. Intravenous metronidazole 500mg 8-hourly and ampicillin 2g 6-hourly were added due to poor response. He remarkably improved with treatment with intravenous antibiotics continued for 3 weeks and discharged with neurology and dental follow-up.

Discussion

Gemella morbillorum brain abscess is associated with congenital heart disease, immunosuppression, poor dental hygiene, and often mimics a brain tumor. In immunoco-mpetent, 55% had an odontogenic primary focus. Appro-ximately 75% showed frontal lobe involvement, and mainly presenting with headache and fever. Antibiotic of choice is a third-generation cephalosporin and metronidazole, in some cases vanco-mycin or ampicillin have been added. Better outcomes are seen with combined surgical and 3-6 weeks antibiotic therapy. Good oral hygiene is a preventive factor. It is important to identify Gemella morbillorum as a rare causative organism of brain abscess needing aggressive treatment to ensure a better outcome.

CP 3

Complicated Salmonella Enteritidis sepsis with fatal empyema in a patient with chronicimmune thrombocytopaenic purpura: A case report

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Introduction

Patients with chronic immune thrombocytopenic purpura (ITP) are susceptible to infections due to the underlying immune dysregulation and immunosuppressive therapy. Here, we report a case of fatal empyema secondary to *Salmonella Enteritidis* sepsis in a patient with chronic ITP.

Case report

A 57-years-old lady taking prednisolone and azathioprine for chronic ITP and osteoarthritis of knee joints presented with shortness of breath and pleuritic chest pain for four days and fever for one week. On admission saturation was 89% with face mask oxygen. Her chest x-ray revealed a right side pleural effusion and an intercostal drain was inserted. Initial white cell count was 17,000/µl and platelet was 67,000/µl. Initial C-reactive protein was 473 mg/dL. Echocardiogram and ultrasound scan of the abdomen were normal. Intravenous meropenem and oral cotrimoxazole were started empirically. She was intubated and ventilated in the intensive care unit (ICU).

Blood culture was flagged positive for Gram negative bacilli after 8.16 hours of incubation. There was a non-lactose fermenter with negative-oxidase, and a Kligler agar slant reaction of K/A with gas and H2S. The isolate was sensitive to all antibiotics tested in the Gram-negative panel and confirmed as *Salmonella Enteritidis* by serotyping and by VITEK® 2 automated system. Pleural fluid and the urine cultures were positive for the same. Intravenous ciprofloxacin oral azithromycin were added and meropenem was continued due to severe sepsis with underlying immunosuppression.

She improved with ICU care, extubated and transferred to the ward with high flow nasal O2 after nine days. Initially she was doing fine but pleural effusion gradually worsened and unfortunately succumbed to death after several days.

Discussion

Pleuropulmonary infections by *Salmonella Enteritidis* are rare and associated with high mortality and morbidity, especially in immunocompromised hosts. Blood culture taken before the first dose of antibiotics plays a crucial role in the diagnosis in case of *Salmonellae* due to its extreme sensitivity to commonly used antibiotics. Prompt and aggressive treatment with drainage of effusion with respiratory support was given from the beginning, however, underlying immuno-suppression and disseminated infection led to a fatal outcome in this patient.

CP 4

Stenotrophomonas spp. pulmonary infection in a patient with Chronic Granulomatous Disease

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Introduction

Chronic Granulomatous Disease (CGD) is a Primary Immune Deficiency disorder in which congenital neutrophil dysfunction leads to recurrent and severe bacterial and fungal infections. *Stenotrophomonas maltophilia* is a Gram negative non fermenter known to cause opportunistic infections in immuno-compromised hosts and hospital-acquired infections.

Case report

An eleven-month-old boy, diagnosed with CGD at the age of six months, had presented to a local hospital with fever, cough, diarrhoea and failure to thrive. He was transferred to a tertiary care paediatric hospital after 3 weeks due to progressive deterioration while on multiple antibiotics, including intravenous meropenem.

History revealed several admissions to local hospitals due to infections. Once he had a nasopharyngeal aspirate growing *Aspergillus* spp. and serum galactomannan of 1.28. Amphotericin B had been given and had been stopped due to a reaction.

On admission to the tertiary hospital, he was febrile and ill. Bilateral crepitations were present in lung fields. WBC was 44.2×10^3/µL (neutrophils 55.2%) and CRP 225 mg/L. Chest X-ray revealed bronchopneumonia. He was initially on empiric anti-TB treatment, intravenous piperacillin-tazobactam and fluconazole. With a multidisciplinary team decision, intravenous imipenem and voriconazole were started to cover possible pathogens such as *Burkholderia cepacia, Serratia marcescens, Nocardia* spp. and *Aspergillus* spp. Co-trimoxazole prophylaxis and anti-TB drugs were continued.

Bronchoalveolar lavage (BAL) yielded a heavy growth of *Stenotrophomonas* spp. It was sensitive to cotrimoxazole and levofloxacin. *M. tuberculosis* was not detected in BAL (Xpert MTB/RIF-Ultra). Fungal studies on BAL showed galacto-mannan 0.43 with negative direct smear and a growth of Exophiala spp.

The child passed away within a few days despite treatment with levofloxacin and co-trimoxazole.

Discussion

Stenotrophomonas spp. has intrinsic resistance to multiple antibiotics, including carbapenems. Colonisation usually precedes clinical infection. A combination of antibiotics such as levofloxacin and co-trimoxazole is recommended. This child had risk factors for infection with *Stenotrophomonas* spp. and evidence of worsening pneumonia not responding to carbapenems and antifungals. Current evidence suggests *Stenotrophomonas* as an emerging pathogen in CGD. As the management is challenging, this pathogen should be considered in the differential diagnosis if the patient is not responding to carbapenems.

CP 5

Case report: Parvovirus B19 induced Pure Red Cell Aplasia (PRCA) in a young patient diagnosed with B-Cell Acute Lymphoblastic Leukemia (B-ALL) in Sri Lanka

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Introduction

Parvovirus B19, a small, non-enveloped DNA virus, causes anemia, particularly PRCA in immunocompromised individuals. We report Sri Lanka's first laboratory confirmed, successfully managed PRCA case.

Case Report

A six-year-old girl, recently diagnosed with B-ALL, presented with persistent anemia despite repeated blood transfusions over the past five weeks. Her hemoglobin level was 6 g/dL, with a red blood cell count of 2.12 x 10^6 µL (normal range: 3.5-5 x 10^6 µL) and a reticulocyte count of 18% (normal range: 35-55%). There were no signs of gastrointestinal bleeding or jaundice. The patient had no recent transfusions but had a fever six weeks prior, which resolved without diagnosis. She was undergoing her fourth chemotherapy maintenance cycle following high-risk induction chemotherapy administered two months earlier. Blood analysis revealed normochromic normocytic anemia with characteristic pencil cells, target cells, and macrocytes. Iron studies showed no abnormalities, and an ultrasound scan indicated mild hepatosplenomegaly with normal bilirubin levels. Coombs' test was negative, and serology for Cytomegalovirus and Epstein Barr virus IgM were also negative. However, Parvovirus B19 PCR was positive with a viral load of 6.1 x 10^{10} IU/mL. This virus spreads through respiratory droplets (saliva, sputum, nasal mucus) and blood products. Hospital staff were educated on its highly contagious nature, advised to use appropriate PPE, practice respiratory and hand hygiene, and isolate the patient.

Discussion

Parvovirus B19 primarily targets erythrocytes, leading to PRCA. The infection manifests as a reduction in all key hematological parameters including reticulocytes, erythrocytes, hemoglobin, and hematocrit. Treatment with intravenous immunoglobulin (Immunorel 5g/100ml) 0.4g/Kg daily for 5 days has been shown to ameliorate and potentially cure the infection. In this case, the patient showed improvement following intravenous immunoglobulin therapy, with an increase in reticulocyte count to 30% and RBC count to 3.4 x 10^6 µL, along with a rise in hemoglobin to 7g/dL in three weeks. Regular monitoring with monthly full blood count and reticulocyte count for six months, followed by biannual assessments, was planned to track the patient's progress.

CP 6

BK virus related haemorrhagic cystitis in an allogeneic HSCT recipient – A single center experience

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Introduction

BK virus-related haemorrhagic cystitis (BKV-HC) is a significant concern for haemato-poietic stem cell transplant (HSCT) recipients, leading to increased mortality, morbidity, and healthcare costs. We present a case of BKV-HC in an HSCT recipient from Sri Lanka, managed in a resource-constrained setting, highlighting the challenges encountered in its treatment.

Case report

A 14-year-old girl underwent allogeneic HSCT for acute myeloid leukemia (AML) and developed gross haematuria with clots on the 66th day post-transplantation while on immunosuppression for acute gut graft-versus-host disease. Early suspicion prompted investigation, revealing high initial BKV viruria (8.59 x 10^{10} IU/ml) and low viraemia (7.62 x 10^{1} IU/ml). Limited antiviral options necessitated a comprehensive management approach involving tapering immunosuppression, bladder irrigation, hydration, and nonspecific intravenous immunoglobulin. Despite these efforts, hematuria persisted with viruria at 3.5 x 10^{8} IU/ml, and viraemia increased to 4.6 x 10^{2} IU/ml.

Challenges in accessing Cidofovir locally led to obtaining it from overseas, administered intravenously alongside continuous bladder irrigation, hydration, and weekly non-specific intravenous immunoglobulin. Subsequently intravesical Cidofovir was administered, resulting in a reduction of BKV viruria to 2.26 x 10^{5} IU/ml, with viremia becoming undetectable after two weeks, indicating successful recovery from BKV infection and symptomatic improvement of haematuria after 8 weeks from onset.

Discussion

Managing viral reactivations post-HSCT is particularly daunting in resource-poor settings like Sri Lanka. The lack of specific treatment options necessitates a strategic approach. Early suspicion, coupled with prompt diagnosis and regular monitoring using BKV PCR, proved pivotal in this case. The multidisciplinary approach, incorporating immuno-suppression tapering, bladder irrigation, hydration, non-specific immunoglobulins with monitoring of BKV viral load showcased the adaptability of available resources.

In conclusion, the successful management of BKV-HC in this case underscores the importance of early suspicion, timely diagnosis, and a multidisciplinary strategy in resource-constrained settings, emphasizing the need for ongoing efforts to enhance access to specific antiviral therapies in such environments.

CP 7

Pulmonary mucormycosis in a patient with uncontrolled diabetes mellitus : a case report

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Introduction

Mucormycosis is an angioinvasive fungal infection with significant morbidity and mortality. We report on a case of pulmonary mucormycosis, an uncommon and severe form of the disease.

Case history

A 32-year-old timber mill worker with diabetes was admitted due to acute onset altered level of consciousness and generalized body weakness. He is a regular smoker and uses alcohol and cannabis as well.

Initial investigations revealed diabetic ketoacidosis, and very high inflammatory markers together with radiographic evidence of an infective focus in the lungs. Broad, aseptate fungal filaments were visualized on direct microscopy of bronchoalveolar lavage fluid and later, *Rhizopus* species was isolated in culture. A review of chest images revealed the presence of 'bird's nest' sign. The patient was started on intravenous amphotericin B deoxycholate therapy. However, therapy had to be withheld on the seventh day due to severe electrolyte imbalances and the general deterioration of his condition. Despite all efforts, he succumbed to death two days later.

Discussion

Mucormycosis is a rapidly progressive fungal infection. Rhino-orbital-cerebral mucormycosis is the commonest manifestation, followed by cutaneous and pulmonary mucormycosis. Most cases of mucormycosis are caused by members belonging to *Rhizopus* and *Mucor* genera.

Poorly controlled diabetes is the most common underlying cause. In this patient, regular alcohol and substance abuse leading to poor nutrition may have been added risk factors. He may have acquired the infection from the sawmill he worked at, as these fungi are frequently found in the outdoor environment. Chronic lung damage caused by smoking, cannabis abuse, and exposure to sawdust may have predisposed him to develop pulmonary disease.

A 'bird's nest sign', suggestive of invasive fungal infections, is seen when irregular, intersecting areas of stranding and irregular lines are present within an area of ground glass opacity.

The development of electrolyte imbalances are well-known side effects of amphotericin B treatment.

This case report highlights the importance of having a high level of suspicion for fungal infection in at-risk patients and early administration of antifungal therapy.

CP 8

Multiple visceral and cutaneous abscesses caused by *Burkholderia pseudomallei* in a healthy female

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[1]National Hospital Kandy

Introduction

Melioidosis is an infectious disease caused by *Burkholderia pseudomallei* found in contami-nated soil and water. Sri Lanka is considered endemic for the disease with prevalence in paddy cultivation areas. It causes severe infections especially in people with comorbi-dities such as diabetes.

This case describes a chronic infection with multiple abscesses in a female without comorbidities.

Case report

Thirty-seven-year-old previously healthy female school teacher, admitted with painful abscesses over buttock, thigh and abdominal wall, fever and productive cough. On admission she was febrile and ill looking. She had a history of pharyngeal abscess three months ago, which was treated at Otolaryngology unit with co-amoxiclav and the drained abscess fluid was culture negative. She has been unwell since then. Initial investigations revealed, white blood cell count of 10.2X109/L (62% neutrophils), CRP 24.8µg/L and ESR 95mm/hour. Intravenous meropenem was started after taking blood for culture, which had no growth. Blood picture showed evidence of bacterial infection. Three samples of sputum were negative for tuberculosis. Drained abscess fluid, enriched in brain-heart infusion broth, grew oxidase positive, Gram-negative bacillus, identified as *Burkholderia pseudo-mallei* and later confirmed by the reference laboratory. Antibody titre for melioidosis was 1:5120. Well defined hypoechoic lesions in the liver and spleen, suggestive of abscesses were revealed on ultrasound scan abdomen. Computed tomography of chest and abdomen revealed multiple lesions; two thick-walled cystic cavity lesions in the apical segments of both lungs, enhanced soft tissue density lesions in the left breast, multiple hypodense focal lesions in the liver segments and two hypodense lesions in the spleen.

Patient clinically improved with intravenous meropenem and oral co-trimoxazole, which was added as adjunctive therapy. Treatment was continued for four weeks and the patient was discharged on oral co-trimoxazole and folic acid following repeat imaging, which showed clearance of the visceral lesions.

Discussion

This case underscores the importance of awareness on the possibility of melioidosis, especially in patients from endemic regions with a history of exposure to contaminated soil or water, even without traditional risk factors and comorbidities.

Dr. Kanthi Nanayakkara

Consultant Virologist and Vaccinologist
Head / Department of Rabies & Vaccine QC
National Control Laboratory
Medical Research Institute
Colombo 8

Prize winners at the 32nd Annual Scientific Sessions of the Sri Lanka College of Microbiologists

Following oral presentations were awarded first, second and third places at the 32nd Annual Scientific Sessions of the Sri Lanka College of Microbiologists held on 24th and 25th August 2023.

1st place - OP 3

Dengue virus inhibitory activity of aqueous extract of Glycyrrhiza glabra roots

Jayasekara KG[1], Suresh TS[2], Goonasekara CL[3], Soysa SSSBDP[4], Jayewardena A[5], Gunasekera KM[5]

[1]Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Ruhuna, [2]Department of Biochemistry, Faculty of Medical Sciences, University of Sri Jayewardenepura, [3]Department of Pre-Clinical Sciences, Faculty of Medicine, General Sir John Kotelawala Defence University, [4]Department of Biochemistry and Molecular Biology, Faculty of Medicine, University of Colombo, [5]Department of Microbiology, Faculty of Medical Sciences, University of Sri Jayewardenepura.

2nd place - OP 7

Detection of *Strongyloides stercoralis* infection in immunocompromised patients in selected tertiary care hospitals in Sri Lanka using coprological and molecular methods.

Weerasekera CJ [1], Wimalasiri U[2], Wijerathna T [2], Menike CW [1], Anpahalan JP [3], Perera N [4] Gunathilaka N[2], De Silva NR [2], Wickrema-singhe DR[1]

[1]Department of Parasitology, Faculty of Medical Sciences, University of Sri Jayewardenepura, Nugegoda, [2]Department of Parasitology, Faculty of Medicine, University of Kelaniya, Ragama [3]University Medical Unit, Colombo South Teaching Hospital, Kalubowila, [4]Department of Medicine, Faculty of Medical Sciences, University of Sri Jayewardenepura, Nugegoda.

3rd place - OP 2

Bio-burden assessment of indoor air in selected areas of three hospitals in the Central province

Paththamperuma PASR[1], Kothalawala M[2]

[1]Postgraduate Institute of Medicine, University of Colombo, [2]National Hospital of Sri Lanka, Colombo

Dr. C. Palasuntheram's prize was awarded to OP 3

Dengue virus inhibitory activity of aqueous extract of Glycyrrhiza glabra roots

Jayasekara KG[1], Suresh TS[2], Goonasekara CL[3], Soysa SSSBDP[4], Jayewardena A[5], Gunasekera KM[5]

[1]Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Ruhuna, [2]Department of Biochemistry, Faculty of Medical Sciences, University of Sri Jayewardenepura, [3]Department of Pre-Clinical Sciences, Faculty of Medicine, General Sir John Kotelawala Defence University, [4]Department of Biochemistry and Molecular Biology, Faculty of Medicine, University of Colombo, [5]Department of Microbiology, Faculty of Medical Sciences, University of Sri Jayewardenepura.

Following poster presentations were awarded first, second and third places at the 32nd Annual Scientific Sessions of the Sri Lanka College of Microbiologists held on 24th and 25th August 2023.

1st place – PP 11

Surgical antibiotic prophylaxis in a District General Hospital:A point prevalence survey

Wijeweera KDDS[1], Priyanthi AAD[2], HAP Anuruddha[2], Hewapathirana VN [2], Heshani NKC [2] Karunaratne NP [2], HRP Niroshana[2]
[1] Faculty of Medicine, University of Ruhuna,
[2]District General Hospital Matara

2nd place - PP 9

Clinical presentation, underlying comorbidities, resistance patterns and outcome of Group A Streptococcus bacteraemia in a tertiary care centre, Sri Lanka

Piyasiri DLB[1], Dias KMGHH[1], Silva SCUM[1], Galhenage MN[1], Jayanath IKA[1], Thewarapperuma CN[1], Nanayakkara IRS[1]
[1]Teaching Hospital Karapitiya

3rd place - PP 5

A retrospective review of hepatitis E (HE) cases in South Hampshire, UK during 2016 - 2021

Samaraweera B[1], Mahanama AIK[1], Silveira S[1], Browning D[1], Labdon C[1], Pelosi E[1]
[1]Southampton Specialist Virology Centre, University Hospital Southampton, Southampton, United Kingdom

Presidential Address 2023

Presidential address delivered at the Inauguration Ceremony of the 32nd Annual Scientific Sessions & Dr Siri Wickremesinghe Memorial Oration 2023 of the Sri Lanka College of Microbiologists held on 23rd August 2023

We're delighted to offer the most hospitable welcome to our distinguished invitees, Chief guest Professor Thevanesam, Late Dr. Siri Wickramasinghe's family members, Orator and the family members, Invitees from Ministry of health- Additional secretary Dr. Lakshmi Somathunga, DGHS, Dr. Asela Gunawardena, DDGLS Dr. Sudath Dharmaratne and other ministry officials, President's of all the colleges, board of directors of SLCM, Immediate past presidents, past presidents, fellow council members, all members of the Sri Lanka College of Microbiologists along with their spouses, all those who have joined online, all sponsors, colleagues, friends, my family members, ladies, and gentlemen.

I am honored to stand in front of you today as the president of the SLCM. Firstly, I like to remember my late father Mr. J.M. Themis Appuhamy Wickremasinghe, My late Mother Mrs. Suwineetha Karunawathi Ranawaka and My late eldest sister Mrs. Vineetha Wickremasinghe. They brought me up and helped me in every possible way to start my career & guide me for who I am today. I remember them with much love and respect and wish them the supreme bliss of Nibbana together with my family members who are here today.

Next, I like to remember the founders of this association as Ceylon Association of Microbiologists – in 1969 with 16 members.

In 1974 the name changed to “Sri Lanka Association of Microbiologists.” Subsequently the current name was adopted in 1979 as “Sri Lanka College of Microbiologists-SLCM”.

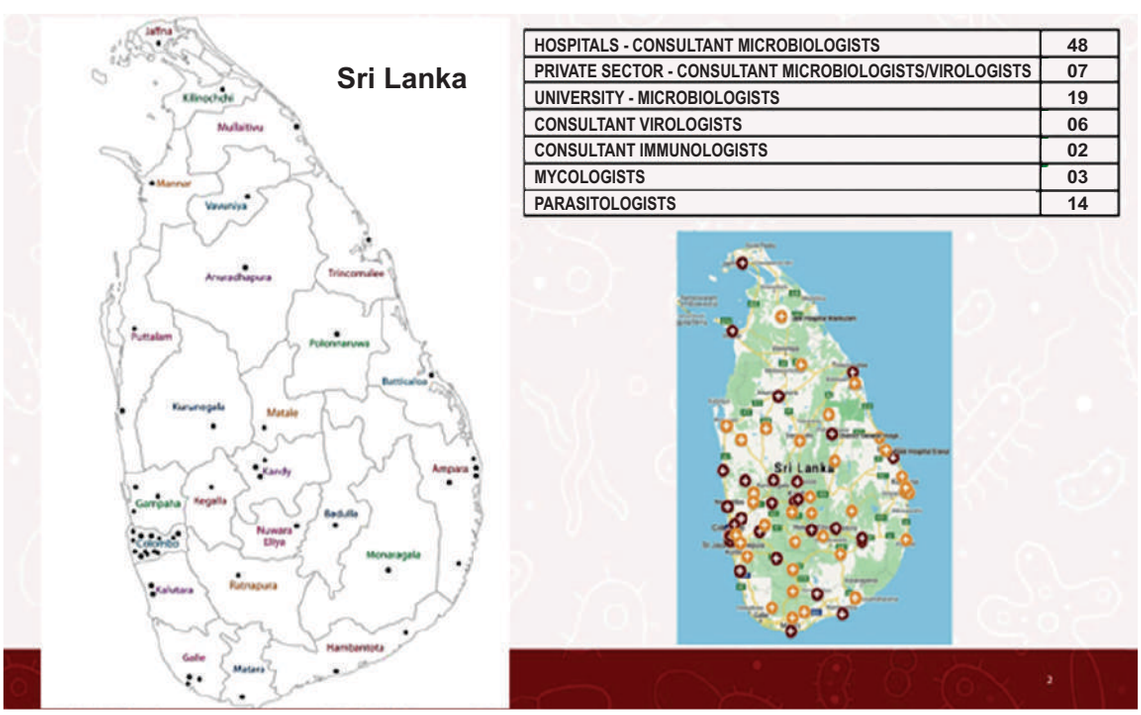
SLCM, 1st Annual scientific session was held in 1991. Late Dr. Siri Wickremasinghe and Prof. Nalini Withana who is representing senior past presidents today were in the sessions.

Today, we are 312 members strong. This scientific community includes those who are qualified in medical, dental and veterinary plus post- doctoral degree holders in Bacteriology, virology, mycology, parasitology or immunology.

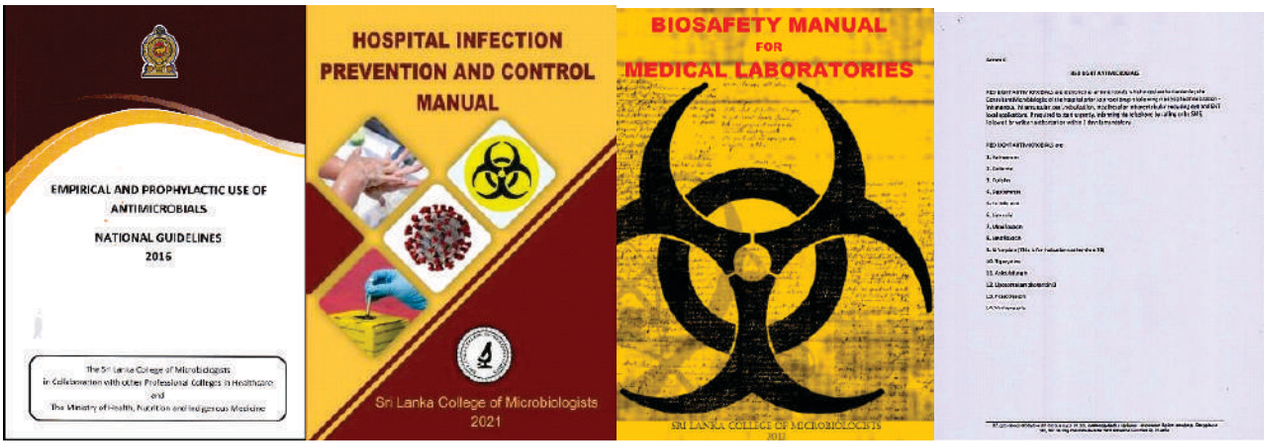
In Sri Lanka the distribution of consultant microbiologists are shown here. In the govt hospitals we have 40 microbiologists. There are around 21 microbiologists in universities. Among both of those, there are 6 virologists, 14 parasitologists, 3 mycologists and 2 immunologists. There are about 07 microbiologists are working in the private sector.

Let me briefly touch on the subject of microbiology and the role of a clinical microbiologist.

Conventional pathogens are capable of causing infections in previously healthy individuals. The organisms isolated from clinical specimens may originate from bacteria and fungi that are permanently living on body surfaces (commensals) or from the environment. Opportunistic pathogens are those that usually do not cause disease in otherwise healthy individuals, but may cause serious infections in those that are immune-compromised. Hence, the significance of laboratory findings depends on the method of specimen collection and needs to be assessed in a clinical context. Serious nosocomial or hospital acquired infections are often caused by commensals and environmental organisms. A clear distinction between a primary pathogen, a commensal and a contaminant is not always clear cut. This situation is frequently encountered in immunologically compromised patients. As a result, the liaison between the clinical microbiologist and the clinician is of paramount importance to ensure a sensible interpretation of laboratory findings and for a successful management of patients. The clinical microbiology profession serves as microbiologists, Virologists, Mycologists, parasitologists and Immunologists in Sri Lanka.



HOSPITALS - CONSULTANT MICROBIOLOGISTS	48
PRIVATE SECTOR - CONSULTANT MICROBIOLOGISTS/VIROLOGISTS	07
UNIVERSITY - MICROBIOLOGISTS	19
CONSULTANT VIROLOGISTS	06
CONSULTANT IMMUNOLOGISTS	02
MYCOLOGISTS	03
PARASITOLOGISTS	14



These are some manuals, circulars, guidelines published by the SLCM to support appropriate management of infections and to prescribe antibiotics cautiously to prevent AMR.

SLCM Web site launched in 2014 by Dr. Roshan Jayasuriya one of the editors of the current council. The website further facilitates members in publishing their papers, articles and activities for a wider group.

ABX guide line review for the 2nd edition. This task was led by Dr. Dhammika Vidanagama and initiated by the past president Dr. G. Patabendige & the council in February 2022. This very important activity mostly done as online meetings. Those were convened and host by two Honorary Joint Secretaries Dr. Naamal Jayawardena and Dr. Chathuri Gunasekera during this tenure. These reviewer committees were volunteers and invitees. This work was carried out in 4 levels to maximize its validity. Level 1 all the chapters were divided among all microbiologists to update them with latest data. At level 2 those chapters were grouped under four steering committees to do the review. At level 3 each chapter was reviewed by two senior consultants. Then at level 4 relevant chapters were sent to external colleges. The inter collegiate reviewers came to do this task on our invitation. This guideline is for all prescribers of antimicrobials. Hence this task to be done in unison and in agreement with all multi disciplines of human health.

All of those reviewers should be highly admired by all of us as they work for this task day and night. In some weeks daily online meetings every week & most days until passed 11 pm after days' work in their respective hospitals. They are from hospitals and universities around the country. This unpaid voluntary task consumed nearly 70 days (about 150 hrs out of their family time). I cannot find words to thank for their dedication.

The massive amount of time dedicated by them is highly admired. Some of them are after retirement while some are still shouldering full time services. Sri Lanka is fortunate to have Microbiologists of that caliber.

This mammoth task will be finalized very soon. Already, discussions were carried out with DGHS and DDGLS to publish this second edition of the antibiotic guideline as an App plus hard copies.

World Antimicrobials Awareness Week (WAAW- 18th to 22nd of November 2022), activities were done by SLCM in collaboration with MoH and WHO. This is one of the well-organized task of this council within a very short period of time where microbiologists of hospitals and Universities together work very hard for a greater outcome.

Under this WAAW we carried out a poster competition among medical students of countrywide universities.

What you see here are posters submitted to the competition by medical, dental and veterinary students of all universities. Microbiologists in Universities Island wide gave their fullest support to carry out these not so easy tasks and we owe them a big thank you. Winners of all competitions were given cash prices from SLCM

Inter medical faculty Quiz competition among medical students was another very successful activity. Those winners also received prices from SLCM.

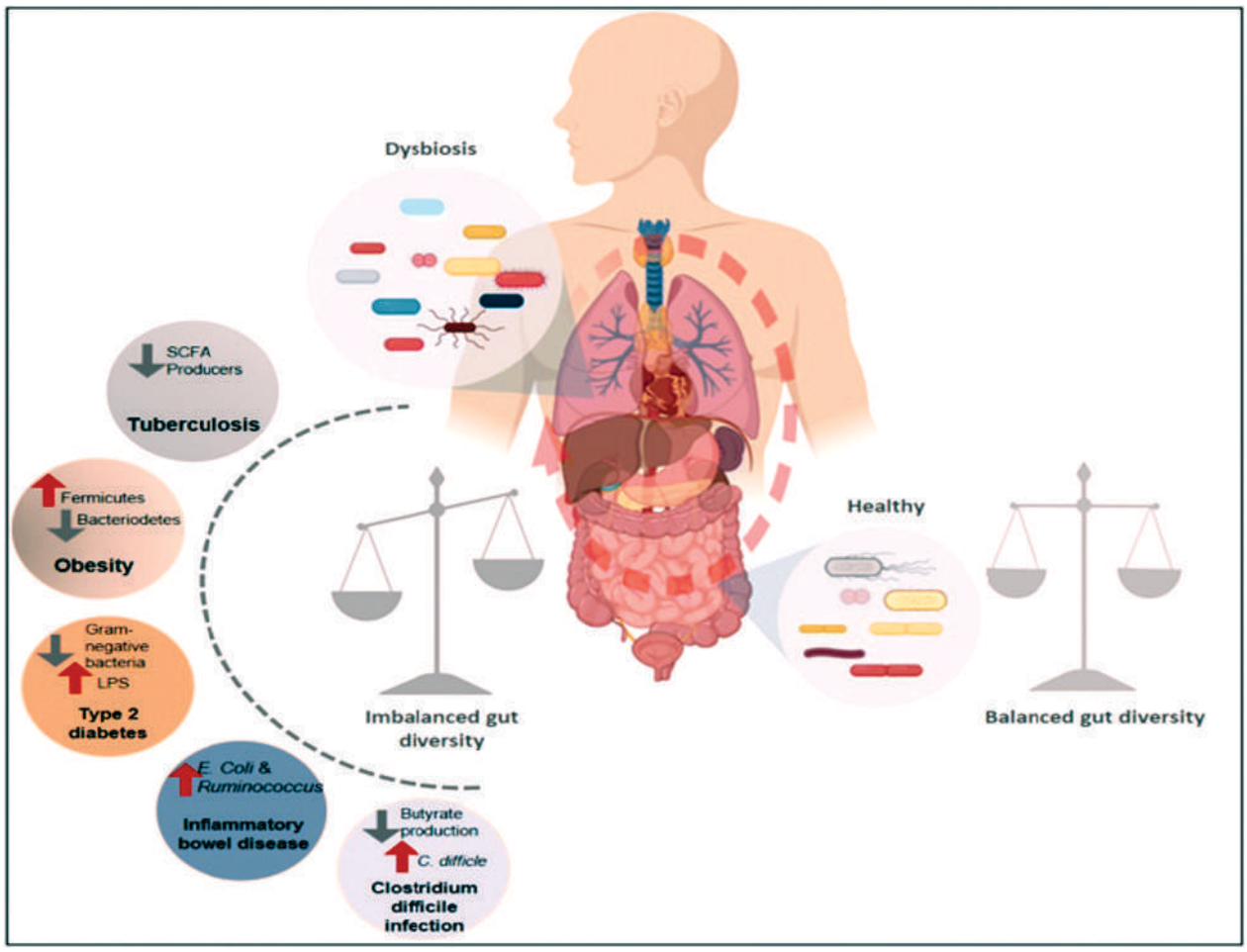
There were several activities conducted during the WAAW in several hospitals island wide led by respective microbiologists.

Educational programs to doctors, nurses, PHI's, pharmacists, Pharmacy owners etc. were done in most of those hospitals while distributing educational leaflets among schools, and general public. In addition, paper articles, Television discussions, provincial educational programs, social media clips, Google surveys also conducted by SLCM in collaboration with MoH and WHO.

AMR- Core group is SLCM appointed experts usually the team changes every three years. NSP update group appointed this year to write a National strategic plan for the country for the next 5 years (2023 to 2028) Which was lead by Dr. Dhammika Vidanagama and consists of six members. These groups are working together with WHO and MoH in a very tight schedule to reach the targets. There are number of physical meetings organized by DDGLS as focal point where as online meetings were convened two secretaries from SLCM as at required. All their hard work is admired.

In addition there are several other ongoing projects such as WHO- SEARO AMS mentoring, pilot program, WHO AWARE classification implementation program etc.

SLCM media program- These media programs are convened by Dr. Madhumanee Abeywardena where all the speakers are voluntary microbiologists. This program broad casts year along in ITN under the mame “piniwiyana”. The purpose is to educate general public on common infections, how to prevent them and when to seek treatment. We specifically advised them, not to take ABX unnecessarily.



Since last 3 decades, it was discovered that most of the diseases of the human either directly or indirectly connected to the "Microbiomes" of the body. Hence, we chose our theme of the annual scientific sessions of 2023 as "Unlocking secrets of the human microbiome to combat virulence and antimicrobial resistance".

This morning, we successfully completed the pre-congress workshop on "wound and skin care- Team work is key to success". MDT concept is a proven success.

Tomorrow and day after (24th and 25th) we will take you through several educational programs with national and international experts.

The council 2022 -2023 consists of 17 members which I must confess that they were amazing. No one said no to any allocated job and it was immeasurable to list out the work and time spent by all of them to finish several tasks given in addition to their full-time careers. Entire credit of all the work done should go to them and if there is any blame or criticism please leave it to me.

All of them are very vibrant, cooperative and very hard working. This council together with invited or volunteered members SLCM is dedicated to following,

-update disseminating the knowledge and practices of Microbiology to its members and other professionals.

- carry out Multiple CPD programs,workshops

- ID conferences with CCP

SLCM offers-research scholarships to the MD trainees

SLCM involved in registration and regulation of antimicrobials, diagnostic materials, sterilants, disinfectants and other relevant laboratory medical products

Currently Working on to get membership of the world sepsis alliance together with COAISL.

There are several activities lined up to carry out by the council during the next two months.

I would like to express My heartfelt thanks to the chief guest, my dearest teacher, the orator my dear friend and colleague, and the Late Dr. Siri Wickremesinghes family members.

My sincere thanks to all the invited dignitaries who grace this occasion,

I express My gratitude to my teachers and trainers who are here today.

I am sincerely admiring and very much thankful to the SLCM Council 2023. The two secretaries Dr. Naamal and Dr Chathuri for their enormous dedication and very positive attitude and excellent skills made my life easier. Thank you, lovely girls. All of the members of SLCM are giving me the pleasure of working as a team. The strength and courage together with shared knowledge is never ending. Thank you, team, you all are amazing.

I am very appreciative and thankful for the generous sponsors' Biomedite, Navesta and the rest for their support for all these activities. Without them we would not be able to carry out massive tasks like this.

Our Office Secretaries Mrs Priyanga and Mrs Amanda, You two became part of our lives while assisting almost all the works we do. We would be thankfully remembering you two always.

My friends, colleagues and collaborators it is a pleasure to have you all in events like this to share the pleasure together.

My brothers and their family members and close relatives who came all the way to share this occasion are appreciated with much love shared both ways. You all are my strengths. My Soul mate my husband Dr. Saman Wadanamby who is supporting, caring and sharing my life more than three decades, you are admired and loved always. My two daughters Samindika and Shavinthi are always in my heart as my angels even though they could not come today.

Please accept my love, gratitude, and sincere thanks by all who are being here today.

Dr. Siri Wickremesinghe Memorial Oration - 2023

Dr. Siri Wickremesinghe Memorial Oration delivered at the Inauguration Ceremony of the 32nd Annual Scientific Sessions & Dr Siri Wickremesinghe Memorial Oration 2023 of the Sri Lanka College of Microbiologists held on 23rd August 2023

Melioidosis, unearthing a subterranean infection

Professor Enoka Corea
Chair Professor of Medical Microbiology and Immunology
Faculty of Medicine, University of Colombo

Thank you, Madam President, for that introduction and for bestowing on me the honour of delivering this prestigious oration. Mrs. Ranganie Wickremesinghe, family members and friends of the late Dr. Wickremesinghe, the President and members of the council, members of the Sri Lanka College of Microbiologists and distinguished invitees, this oration is dedicated to the memory of a pioneer microbiologist of Sri Lanka, Dr. Rakitha Sirimal Wickremesinghe.

Dr. Wickremesinghe was a beloved and dedicated teacher and mentor, a proficient microbiologist, an erudite scholar, a keen sportsperson and a lover of nature. He was actively involved in the Sri Lanka College of Microbiologists and was a member of the council at the time of his death. On a personal note, I remember him as a teacher with high expectations who did not countenance slipshod work. Once we approached him, a little tentatively, to comment on a culture plate. He took one glance at it and said “don't come back until you have a pure culture”. I have never forgotten this basic principle of bacteriology and continue to impart it to my students.

Dr Wickremesinghe possessed a wide experience in infectious disease, having worked in many parts of the world. This was epitomized in his Presidential Address in 1994 in which he covered the full range of microbiology at that time. What is remarkable, and very special to me, is that during this Address he predicted that melioidosis should be present in the country. So there is more than one reason for dedicating this oration to his memory.

This evening I hope to give you a brief account of the history of melioidosis and an outline of the work we have done to elucidate the clinical and seroepidemiology of melioidosis in Sri Lanka, isolate the causative bacterium from the environment and some insights obtained from genotyping of strains.

We cannot talk of the history of melioidosis without starting with glanders, which is in infection of horses. A hundred years ago the word “horsepower” meant exactly that. Horses were essential for transportation, carrying cargo, agriculture and even war. Horses were more valuable than humans, and a much feared disease was glanders, an equine infection caused by the bacterium *Burkholderia mallei,* that could wipe out whole stables resulting in economic ruin. Glanders was known even to the ancient Greeks and Aristotole describes it in Book VIII of his Historia animalium giving it the name 'melis' or hammer. Glanders could also be transmitted to humans who worked closely with horses and cases of human glanders were not uncommon.

In 1902 Captain Alfred Whitmore of the Indian Medical Service was posted to the Rangoon General Hospital in Burma to establish a pathology service. During that period he was given orders to investigate an outbreak of suspected glanders and it was during this investigation that he says “our eyes were opened to the fact that there was an infective disease somewhat resembling but easily distinguishable from glanders, prevalent among the ill-nourished, neglected wastrels of the town”, mainly morphine addicts. He published his account of this “hitherto undescribed infective disease” in the Indian Medical Gazette of 1912, just over a 100 years ago. It is said that Sir Arthur Conan Doyle may have read this article and been inspired to write his story “The Dying Detective” where the villain attempts to kill Sherlock Holmes by sending him a box of soil containing a deadly tropic bacterium. Anyway this new disease became known as “morphia injector's septicaemia” or “Whitmore's disease”. However, following this, a large series of patients were described by Stanton and Fletcher working in British Malaya and none of them were in drug injectors so that the term “morphia-injectors septicaemia' was no longer valid and they suggested the name “melioidosis” because the disease and its bacterium were similar to glanders which (if you remember) the Greek physicians had called 'melis'. So the term 'melioidosis' simply means a disease that resembles glanders! Similarly, since the bacterium that causes melioidosis very closely resembles the bacterium that causes glanders, *Burkholdera mallei,* this new bacterium has got the name *“Burkholderia pseudomallei”* or 'false' mallei, to warn microbiologists that the bacterium closely resembles B. mallei.

Coming back to melioidosis, after the initial cases in Burma, patients were subsequently describe in Cochin China, modern Vietnam, and in 1927, the fourth country to report melioidosis was none other than Ceylon, where Lucius Nicholls of the Pasteur Institute, now the Medical Research Institute (MRI),

described a fatal case of melioidosis in “a European of good social standing and living in hygienic surroundings.” So Sri Lanka has been on the map of melioidosis right from the beginning and the fact that it was found in South Asia must have been a very important milestone as it is still featured in timelines of melioidosis.

Although the majority of this audience is very conversant with this infection, there are some invitees who may have never heard of melioidosis. I would like to spend a few minutes introducing melioidosis to those who are unfamiliar with the topic and I hope the microbiologists will bear with me as I explain the background of this infection to them.

In a similar manner in which the term 'tuberculosis' is used for all manifestations of infection with *Mycobacterium tuberculosis*, melioiodisis is the name given to all manifestations of infection with the bacterium *“Burkholderia pseudomallei”. B. pseudomallei*, is a Gram negative, oxidase positive, glucose non-fermenting bacterium, similar to Pseudomonas and it is a saprophyte found in soil and water. It is particularly abundant in paddy lands. The distribution of this bacterium and, therefore, the distribution of melioidosis is restricted to the tropics and subtropics between 20°S and 20°N of the equator. Thailand, Malaysia, Singapore and Northern Australia have reported large numbers of cases. Sri Lanka, positioned between 5-10° N of the equator, is situated in the endemic belt and has similarities in weather and environment conditions with these countries, and therefore, it is not surprising that Dr Wickremesinghe predicted that it should be present in this country.

B. pseudomallei is not a primary pathogen but is acquired accidentally during the course of occupational, recreational or lifestyle exposure to soil and water. Rice farmers, other cultivators and gardeners, persons serving in the military service, workers on construction sites and labourers are at high risk.

Melioidosis has several unusual features. One is its highly variable incubation period. Infection usually manifests 2 days to 2 weeks after exposure, with a median of 9 days but *B. pseudomallei* can remain latent in the body within macrophages and manifest months, years and even decades later. In fact, for some time it held that record for the longest incubation period where a soldier taken POW in WWII presented with clinical disease 62 years after the initial exposure but now, due to genotyping we know that he was probably infected in America itself so that record no longer holds true. Melioidosis is also notorious for its protean clinical manifestations, which range from acute fulminant sepsis with or without pneumonia with high mortality to chronic, localized infection with abscess formation, and its ability to spread to and affect any tissue or organ of the body after exposure, presenting as localized, multifocal or systemic disease and which has earned it the epithet “the great mimicker”. Melioidosis is also feared for its tendency to relapse months or years after treatment which has given it another nickname “the Vietnamese time bomb because a Vietnam war veteran could never be sure when infection would recur, years to decades after they returned home.

Let's move back to the story of melioidosis in Sri Lanka We can see that Sri Lanka lies in the tropics, within the melioidosis belt. We also know that and rice and rice flour is our staple diet, and that *B. pseudomallei* thrives in paddy fields. However, after that first early report in 1927 only two other cases were reported one in 1993 in a Belgian traveler to the island and the first indigenous case in 2003 (published in 2005). Even the tsunami of 2004 did not throw up any evidence of meliodosis and with only two to three cases in 75 years meliodosis in Sri Lanka was considered a disease with sporadic occurrence.

This changed in 2006 when Professor Vasanthi Thevanesam, our Chief Guest today, came across an unusual blood culture isolate in the

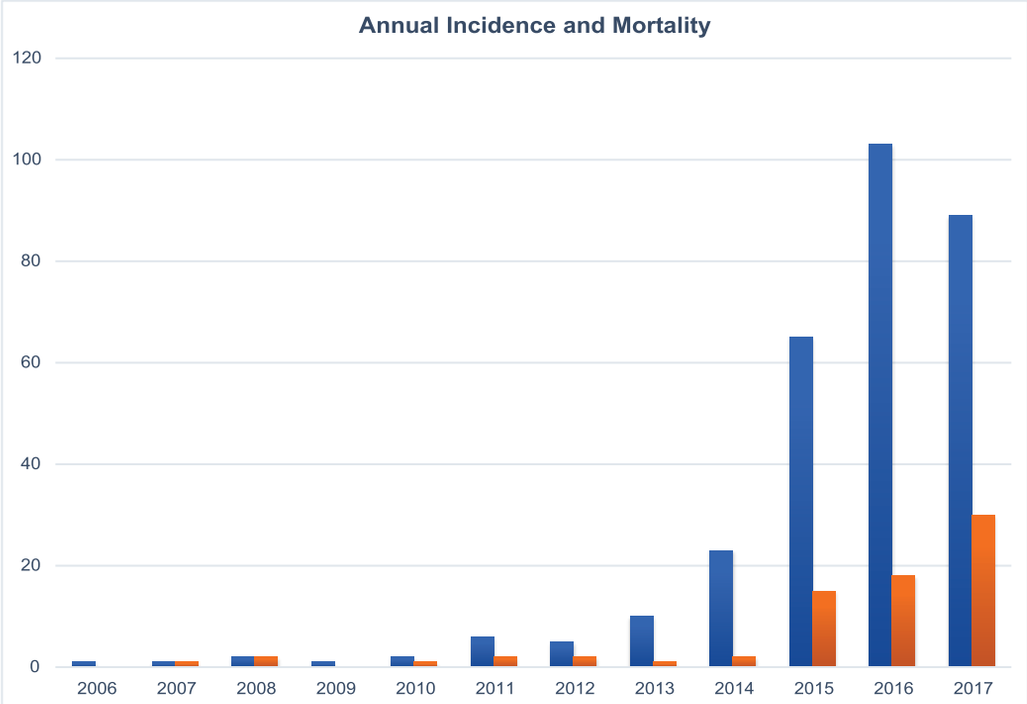
Peradeniya Teaching Hospital. Although she had never seen one previously she immediately identified the culture as *B. pseudomallei* and contacted experts using the internet to get advice on management of this patient who survived. Shortly afterwards another blood culture from a fatal case of septicaemia also became positive for the same bacterium. Prof Tim Inglis of PathWest, Western Australia visited the country and confirmed the identification of these isolates and a collaboration was set up with his laboratory in Perth and I commenced the prospective case-finding activities reported in this oration.

So how do you set out to conduct surveillance on an infection that both clinicians and microbiologists are unfamiliar with? Actually, when we set out to look for melioidosis we had no real idea how to do this but with hindsight I can share our experience that may be useful to the young microbiologists who are keen to study a particular infection. The most important resource you have is your colleagues in this College. So the first thing we did was to set up connections with all the clinical microbiologists throughout the country, you could term it a national clinical microbiology network but, in reality, it was just my friends who served as Consultant Microbiologists in hospitals across the island. We developed a working case definition for active case surveillance to give some guidance to the clinicians.

Next, we set up a reference laboratory at the Faculty of Medicine with a standard laboratory work up procedure for culture and identification of the bacterium based on its typical colony morphology, microscopic appearance and antibiotic sensitivity pattern. Suspect isolates were sent to Dr Dharshan de Silva's laboratory at Genetech for confirmation of identify by real time PCR. We also established the indirect haemagglutination assay for testing for melioidosis antibodies using an in-house preparation of bacterial antigen. And, finally, we designed a standard questionnaire for data collection. The first imperative was to educate the medical community about the presence of this infection. Awareness was raised chiefly among microbiologists but also among clinicians through lectures, presentations and publications, e-mails and personal communication. I have to state that initially these communications were greeted with skepticism and there were many clinicians who did not believe that melioidosis was present in this country but the microbiologists were totally committed and enthusiastically embraced the possibility.

I have to admit that initially case detection was very slow. However, the number of hospitals sending suspected cultures to our laboratory for screening and PCR confirmation steadily increased over time. As microbiologists were assigned to underserved areas such as the Batticaloa and Jaffna Teaching Hospitals we started receiving samples from the Eastern and Northern Provinces as well. I am happy to say that due to the dedicated work of the microbiologists we have detected more than 850 culture positive cases of melioidosis with about five times that number diagnosed as meliodosis by high antibody titres. However, the analysis I am going to show is restricted to the culture confirmed cases up to 2017.

After the initial slow start, the number of culture positive cases rose dramatically every year, and now we have around 100 culture positive patients every year with about five times that number diagnosed by serology. Melioidosis is prevalent throughout the island with all 9 Provinces affected, the highest number being from the Western and North Western Province. We still do not find any cases at higher elevations.



The age range of patients is wide (from neonate-92 years), reflecting the ubiquity of exposure to soil in the Sri Lankan population. However, the majority of patients are middle-aged and men, corresponding to likelihood of soil exposure and age of onset of diabetes.

While men (113/163,69%), farmers (30/163,18%) and rural populations (133/160,83%) predominated there was representation of every population group from blue collar workers including labourers and construction workers (n=8) to housewives (n=29) and school children (n=10) and even professionals (n=4) including physicians and school principals, businessmen and women (n=5), white collar workers including irrigation officers, technicians, and clerks (n=10). There were10 patients (7%) who belonged to the defence forces, army, police or civil defence and 20 (12%) were drivers.

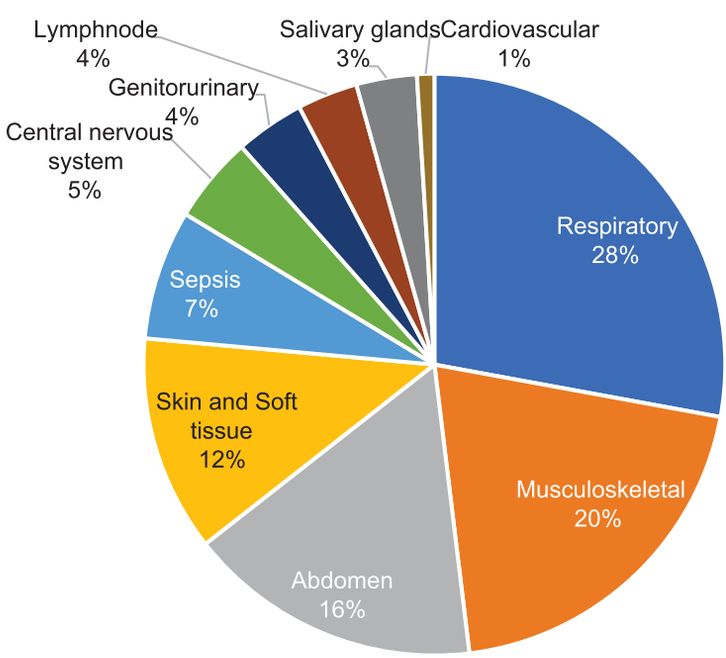
Although only a minority of patients (n=30) gave their primary occupation as being farmers, when we probed further we found that a large proportion of patients admitted to frequent exposure to soil and ground water during cultivating or gardening. So one important finding of this epidemiological study was that melioidosis in Sri Lanka is not a disease limited to rice farmers but an infection related to the outdoor, agricultural, barefoot lifestyle still practiced by the majority of the population as shown in these photographs of home gardens. The large number of drivers, especially three wheeler drivers and motorcyclists in this series is intriguing and a possible explanation is exposure to dust. Another prominent risk factor that has come to the fore in the recent past is the number of cases following exposure to floods which comprise a significant exposure in this series.

We know that severe melioidosis is more common in people with an underlying predisposition, with diabetes mellitus, renal, liver or lung disease, thalassaemia and alcoholism carrying a substantial excess risk. Diabetes in particular has been shown to carry a high risk of disease and the association between diabetes and melioidosis is the strongest described between an infection and an underlying predisposition ranging from a relative risk of 7.5 to 100, higher even than the association between diabetes and tuberculosis. While diabetes was the predominant risk factor, seen in 113/163 cases (70%), other organ disease and alcoholism were seen and thalassemia was a significant risk in children seen in 3 of our 10 children. However, melioidosis was also seen in many (23/160, 14%) healthy adults and children with no obvious risk.

As expected clinical presentations were varied ranging from acute sepsis to chronic abscess formation, reflecting the protean nature of this infection and manifesting in the full gamut of clinical infection. As in other series, lung infections predominated followed by musculoskeletal infections including septic arthritis, muscle abscesses and osteomyelitis and abdominal involvement chiefly abscesses of the liver, spleen or psoas muscle. Skin and soft tissue abscesses followed. While the majority of patients were blood culture positive and septic, 15 presented with septicaemia only without any obvious focus. Central nervous system infection was seen similar to the clinical presentation reported from Northern Australia in the form of meningitis, subdural empyema, cerebral abscess, brain stem encephalitis, transverse myelitis, Guillan Barre syndrome and status epilepticus. It is interesting to note involvement of the salivary glands in many patients similar to the clinical presentations in Thailand. Genitourinary involvement was seen in 7 patients with urinary tract infection or prostatitis. The cardiovascular system was affected with pericardial effusion and endocarditis, an extremely rare presentation. The key message is that most patients had involvement of more than one organ or system. Many of these cases have been published as case reports in national and international journals.

It is of note that many patients showed involvement of the lower limbs (27%) such as septic arthritis, psoas muscle abscess and cellulitis and this may reflect bacterial entry by inoculation into the lower limbs consistent with a barefoot lifestyle. And many presented with salivary abscess or involvement of the liver which may reflect the ingestion of untreated water used for drinking purposes.

The most important feature of this infection is its high mortality ranging from 20% in Northern Australia to 50% in Thailand. Mortality can be reduced considerably by early diagnosis and effective therapy with antibiotics such as ceftazidime. In fact, the clinical trial that established ceftazidime as the standard treatment for melioidosis was the most successful clinical trial in history showing halving of the mortality with treatment. Treatment is complex and expensive with a prolonged course of intravenous antibiotics for the acute phase followed by an even longer course of oral eradication therapy to prevent relapses.



Overall mortality in our series was as high as 22% (36/167) with a toddlers, school-going youth and healthy adults among the dead. However the mortality compares favourably with the mortality of melioidosis in Northern Australia (19%) versus the mortality in Thailand (50%).

Natural disasters, such as the tsunami of 2004 uncovered new locations where melioidosis had not been previously described as in this region in Southern Thailand but no such cases were reported in Sri Lanka after the tsunami, perhaps because we did not identify the cultures at that time. In the dry season the bacteria are found in the deeper, moister levels of the soil and infection is usually sporadic but in the wet season they move up to the surface. Therefore, the incidence of melioidosis increases in the rainy season with the number of cases correlating with total rainfall.

In Sri Lanka meliodosis was present in the wet, intermediate, dry and even in the arid zones. When charting seasonal trends based on rainfall, particularly the South Western and North Eastern monsoon, we see that cases are seen throughout the year with a trend of two peaks during the monsoons. This is consistent with studies in many other countries that have shown increased cases during the rainy season. Flooding has been shown to increase the incidence of melioidosis and the torrential rainfall experienced in May 2015 may have contributed to the high peak of infection that we see in June.

While most of the cases were sporadic and unrelated to each other there were some interesting epidemiological clusters. One was melioidosis affecting two thallasaemic siblings from Maha Oya that occurred six months apart. They had probably been infected during the construction of a new house. We know that case clusters of melioidosis may occur after severe weather events and such a cluster was seen. The other was a case cluster of 10 cases in Batticaloa in Oct/Nov 2015 following heavy rains. This rainfall map depicts precipitation in the week ending 29th October 2015 and shows the severe weather experienced in the Eastern Province that month. Within a few days to weeks after exposure, 10 culture positive patients were detected at Batticaloa Hospital. There were four deaths including three female patients who had severe community acquired bronchopneumonia, indicating acquisition via inhalation, including two healthy women in their twenties, one of whom had only just completed her A/levels. A similar cluster was seen in 2017/18 in Akkaraipattu, diagnosed on antibody testing. We are expecting similar flooding in the Eastern Province this monsoon season so we should be alert to such case cluster occurring this year too.

When we plotted the distribution of our cases on topography and land use maps from the National Atlas of Sri Lanka an infection-free area, comprising the highlands above 500m was noticed. Looking at this further we found that the distribution of melioidosis while predictably coinciding with rice growing areas, seemed to be absent from rubber and tea growing regions. It is intriguing to speculate on the reason for this distribution. Is it due to the low temperatures in the hill country or different soil conditions or do the agricultural practices used in tea and rubber cultivation result in low risk for exposure? Further research including soil sampling for *B.pseudomallei* from each of these areas will be needed to elucidate this question. We were able to publish our results and establish melioidosis as endemic to Sri Lanka.

Seroepidemiology is often used to get a snapshot of exposure to *B. pseudomallei* in a country, as healthy people who are exposed to the bacterium develop antibodies that are detectable on testing with the IHA. A seroepidemiology study was conducted in 32 blood banks distributed throughout the country on 675 blood donors using the indirect haemagglutination assay between 2011 and 2013. Antibodies to *B. pseudomalle*i were quantified and the cut-off for seropositivity was set at an antibody titre of ≥1:40.

The seroprevalence of antibodies against *B. pseudomallei* in healthy blood donors was 7.4% (50/675). When the association between Province and positivity was explored, donors from the North Western Province were significantly more likely to be positive than donors from the rest of the country. This is compatible with the distribution of cases that we have seen in subsequent years. There was a trend of seropositivity increasing with age and a significant association between farming and seropositivity.

Worldwide, *B. pseudomallei* strains belong to two major clades. The YLF strains are found in South East Asia while the BTFC strains are restricted to Australia and Oceania. PCR was used to identify the clades of our isolates. Although the majority of strains (n=131) belonged to the YLF (Yersinia-like fimbrial) gene cluster which is characteristic of South East Asian strains, surprisingly, as many as 26 17% of the strains were of the BTFC *(B.thailandensis*-like flagellum and chemotaxis) gene cluster which is typically found in Northern Australia. Further research is needed to explain this unusual distribution but it interesting to note the central position of India and Sri Lanka in the supercontinent of Pangaea, before it split into Gondwanaland and Laurasia and this mixed distribution may reflect that central location.

Genotyping of *B.pseudomallei* is performed using multilocus sequence typing (MLST). In this method 7 housekeeping, or relatively conserved genes are amplified by PCR. The amplicons are sequenced and each unique allele given a number. The seven number code generated for each strain is compared with the international database. ST. Currently Sri Lanka has the largest representation (number of strains submitted) on this database of all the countries in South Asia.

MLST genotyping of Sri Lankan strains revealed a high diversity, with 46 different STs represented in the collection. Of these 40 are novel sequence types distinct from those previously documented in the international MLST database.This molecular epidemiology is compatible with a bacterium that has been endemic in the country over a long period of time, even millennia, than of one that had been recently introduced. Further proof that the bacterium has been present in this country for thousands of years is the observation that strains from Sri Lanka cluster separately from strains from South East Asia and Australia in the E burst dendrogram again suggesting separation far back in geological time.

We have also done some preliminary work to ascertain the presence of *B. pseudomallei* in soil in Sri Lanka. In the first phase a visiting microbiologist from Austria collaborated with us to conducted soil sampling in the home compounds and paddy fields of four of our following standard published guidelines with permission from the Geological and Mines Survey Bureau. The soil samples were subjected to quantitative PCR to quantify the bacterial load. To summarise the results 70% of the soil samples were positive for *B pseudomallei* DNA with some sample having estimated bacterial loads of 105-106 bacteria per gram.

Subsequently, with a grant from the NRC obtained by Dr Dharshan de Silva we were able to carry out wider soil and water sampling from patients in the Western, North Western and Southern provinces and successfully cultured *B. pseudomallei* from water and soil.

Having established the presence of *B. pseudomallei* as an integral part of the soil microbiome of Sri Lanka since ancient times through soil sampling, demonstrated significant exposure of the Sri Lanka population to this bacterium through seroepidemiology and shown that melioidosis is endemic throughout Sri Lanka, with a wide geographic and demographic distribution through the clinical study it remains for us to try and explain how melioidosis remained unrecognised for so many decades.

It is likely that the reasons are multifactorial. This is a rural disease affecting remote populations and underserved communities. Clinical factors such as lack of physician awareness, protean manifestations and rapid fatality and most importantly, the lack of microbiology services, including blood culture facilities and onsite clinical microbiologists would have contributed to the disease being overlooked. This is not unique to Sri Lanka as even in Burma, where the infection was first described, cases are now rarely described. Our neighbouring countries also report very few cases and in fact, cases in those countries are most commonly reported in migrants to developed countries. This has been true for Sri Lanka as well. The epidemiology of melioidosis has been compared with an iceberg, since the majority of cases in tropical countries, including South Asia, are hidden from view.

A recent publication that estimated the burden of melioidosis on a global scale using mathematical modelling estimates that, going on to quantify the burden the paper identifies South Asia as probably having the largest 'at risk' population and goes on to detail the predicted incidence and mortality for each country. According to their estimates Sri Lanka is predicted to have an annual incidence of 1800 cases with 600 deaths. So the 100 patients we hope to diagnose this year is very very much the tip of the iceberg. The paper concludes, that the global mortality of melioidosis exceeds the mortality of dengue and leptospirosis. However, much of this burden of disease is undetected

It is likely that the incidence of melioidosis will increase, fueled by the diabetes epidemic that is raging in countries of South Asia including Sri Lanka. Improved diagnosis has led to reduced mortality through early effective therapy but the mortality rate can be brought down further by fostering a higher index of suspicion in clinicians leading to early diagnosis and therapy. Since diagnosis cannot be made on clinical presentation alone and expanding facilities for bacterial culture is mandatory for confirmation. There is an urgent need to extend surveillance of melioidosis to relatively under-resourced parts of the country and to populations at high risk. And we have to work together to make melioidosis a notifiable disease in Sri Lanka and that can only be done by collecting systematic data on our patients. So I earnestly request you all to participate in

collecting data on melioidosis cases so that we can present this to the Epidemiology Unit to justify this request.

Madam President, my aim in delivering this prestigious oration was to raise awareness of this neglected tropical disease, so neglected that it does not even feature on the WHO list of neglected tropical diseases in the hope that Sri Lanka can lead the way in South Asia by establishing melioidosis as a notifiable disease.

This work, although presented by me, is the result of years of effort by many people. I would particularly like to acknowledge the contribution of Professor Vasanthi Thevanesam and Professor Tim Inglis of PathWest, Western Australia who pioneered the work. Dr Dharshan de Silva and Dr Himali Jayasinghearachchi of the KDU for raising funds and designing projects. The laboratory staff of the Faculty of Medicine, Colombo, particularly Ms Jayanthi Masakorala for their unstinted cooperation in developing the reference laboratory and, most of all to all of you, the Microbiologists of state and private hospitals who identified suspected cases and assisted in collecting the data I presented today. I would like to acknowledge the support of my parents and family for giving me the time to do this work, sometime while neglecting family duties. Funding for this study from the University Grants Commi-ssion, the National Research Council and the United States Army Medical Research Institute of Infectious Diseases is gratefully acknowledged.

And finally thank you ladies and gentlemen for your patience.

Dr. Siri Wickremesinghe Memorial Oration - 2024

Dr. Siri Wickremesinghe Memorial Oration 2024
on
'Plugging the vascular leak in dengue'
by

Prof. Neelika Malavige

Professor, Department of Immunology and Molecular Medicine,
University of Sri Jayewardenepura

Articles

Varieties of presentations by *Listeria monocytogenes*; a case series with literature review

Liyanage AKG [1], Piyasiri DLB [1], Jayasekera PK[1], De Silva H. [1], Jayasinghe PA[1], Sugathadasa N[2]
[1]Teaching Hospital, Karapitiya, Galle, Sri Lanka, [2]Base Hospital Balapitiya, Sri Lanka

Introduction:

Listeria monocytogenes is a gram positive non sporing intracellular bacillus which can thrive in diverse environments. It has emerged as a formidable pathogen capable of causing severe infections in susceptible individuals including the immunosuppressed and elderly, as well as to a lesser extent in pregnant women, unborn or neonates. While gastrointestinal manifestations are the commonest, this case series also describes the infrequent, yet critical occurrence of *Listeria monocytogenes* meningitis and lung infection. The bacterium has its unique ability to breech the blood brain barrier which is associated with significant mortality and morbidity. This emphasizes the importance of heightening clinical awareness and timely interventions in managing such cases. Through in-depth exploration of specific patients with Listeria monocytogenes infection via this case series, we aim to contribute to the growing body of knowledge surrounding clinical nuances, diagnostic challenges and therapeutic considerations.

Out of the 8 cases of this series, 6 were associated with meningitis. Out of these 6 cases, one was complicated with atypical pneumonia. Other two were patients of 2 extremes of age with uncomplicated gastro-enteritis, which is one of the commonest presentations of the orga-nism.

All cases were diagnosed by positive cultures from blood or CSF, preliminarily identified according to the colony morphology, Gram stain, beta haemolysis and bile esculin hydrolysis on the 1st day itself which were confirmed by Vitek automated identification within 48 hours and later by the reference laboratory too.

Case no1 to 6 explore immunocom-promised or those with significant risk factors, who were later diagnosed with Listeria meningitis.

Case 1 explores an immunocompromised patient, who was initially suspected to have an organic brain lesion on whom antibiotics were started after blood cultures once an infection was suspected.

Case 2 describes an immunocompromised patient presented with both neurological and respiratory signs. Even though patient was started on empirical antibiotics, he was also started on intravenous dexamethasone pulse therapy and continued for 5 days until lumbar puncture revealed the possibility of central nervous system infection simultaneously with pneumonia and exacerbation of underlying interstitial lung disease. This pulse therapy might have had contributed to the worsening of the infection.

Case series report: (Managed at Teaching Hospital Karapitiya since 2020 to 2023)

	Age	Presentation	Examination	Comorbidities and risk factors	Investigation Findings	Treatment regime	outcome
1	72yrs Male (Nov 2023)	Fever and confusion for 5days, severe frontal headache for few days	Alert, mildly confused patient with GCS of 14/15, mild neck stiffness	Sero positive Rheumatoid Arthritis and was on steroids and immunosuppressants History of consumption of expired dairy products	WBC- 10670/micL (N-88%) Platelets – 250000/micL CRP-90mg/L Blood culture- *Listeria monocytogenes* LP-Lymphocytosis with high proteins and Low glucose with reduced CSF/Serum Glucose ratio CSF culture- No growth NCCT Brain – No acute Changes	IV ampicillin 2g 6h since D4 IV ceftriaxone 2g 12h since D3, later changed to IV meropenem 2g 8 h after 1 wk and continued for 21 days IV dexamethazone 4mg 6h for 48h	Discharged 1 month after, with a slow neurological recovery, complicated by B/L lower limb weakness
2	44yrs Male (Sep 2023)	Worsening Severe headache for 2 days associated with fever and confusion	Confused GCS of 12/15 with significant neck stiffness. SPO2 of 91% on room air with coarse and fine crepitations in right side middle and lower zones with a mild tachypnea	Dermatomyositis and polymyositis Interstitial lung disease (ILD) Lichen Planus Was on steroids and immunosuppressants SAFARI driver by profession	WBC- 16600/micL (N-95%) Platelets – 195000/micL CRP-445mg/L Blood culture- *Listeria monocytogenes* LP- Leukocytosis with high proteins and glucose level of zero CSF culture- Listeria Monocytogenes NCCT Brain – No cerebral edema HRCT- Atypical Pneumonia in the background of ILD	IV meropenem 2g 8 h for 19days IV vancomycin 1g 12h for 3days, IV acyclovir 500mg 8 h for 3 days After positive cultures, vancomycin and acyclovir omitted and IV ampicillin 2g 6h added for 16 days IV dexamethazone pulse therapy for 5days	Expired after 3 weeks in the ICU
3	67yrs Female (Dec 2023)	Reduced responsiveness for one day History of food aspiration	GCS of 8/15.	Diabetes Mellitus Hypertension Ischemic Heart disease R/S Minor ischemic stroke	WBC- 23230/micL (N-92%) Platelets – 330000/micL CRP-181mg/L Blood culture- *Listeria monocytogenes* LP-Lymphocytosis with high proteins and normal glucose level CSF culture- No growth NCCT Brain – No acute Changes	IV meropenem 1g 8h for 11 days, After cultures, IV ampicillin 2g 6h for 22 days	Discharged after 1 month with a slow neurological recovery

4	14yrs Male (Nov 2023)	High grade fever with chills and rigors, headache, vomiting and neck pain of 1day duration	febrile Confused (GCS14/15) Disoriented Positive neck stiffness and Kernig's sign Gait was unsteady B/L lateral rectus palsy. Later developed visual disturbances with difficulty in seeing distance objects.	Thalassemia trait History of very close contact with sick pigeons	WBC- 25700/micL (N-92%) Platelets – 169000/micL CRP-210mg/L Blood culture- *Listeria monocytogenes* LP-Lymphocytosis with Low glucose with reduced CSF/Serum Glucose ratio CSF culture- No growth NCCT Brain – No acute Changes MRI Brain-Chronic demyelinating disease need to be excluded Repeat NCCT brain- Acute hydrocephalus with cerebral oedema	IV ceftriaxone 1g 12h for 6 days, IV acyclovir 500mg 8h for 6 days, IV ampicillin 2g 6h since D4 of admission) IV meropenem for 1 day since D5 of admission	Expired after 3 days in the ICU with severe cerebral oedema
5	61 yrs Male (2021)	Fever, headache for 2 days Confusion	Disoriented on admission GCS deteriorated with features of meningism over next 24 hrs after admission	Diabetic History of recent consumption of unpasteurized milk Had been on proton pump inhibitors for one month	WBC – 23000/micL CRP–168mg/L, NCCT brain – normal LP – leucocytosis with high protein and low glucose with reduced CSF/Serum Glucose ratio CSF culture and Blood culture – *Listeria monocytogenes* Repeat NCCTs due to sudden deterioration after initial improvement – rapidly expanding left parieto-occipital haemorrhage.	IV ceftriaxone 2g 12 h, IV ampicillin 2g 4 h, and IV dexamethasone 8mg 8 h since D1 which caused significant clinical improvement initially until succumbed to sudden cerebral haemorrhage.	Expired after 1 week in the ICU
6	70yrs Male (2021)	Fever, vomiting, headache for 1 day	Febrile GCS 9/15	Multiple myeloma Recent chemotherapy	CRP-244MG/l NCCT brain – normal LP - leucocytosis with high protein and low glucose with reduced CSF/Serum Glucose ratio CSF culture – No growth Blood culture – *Listeria monocytogenes*	IV ceftriaxone, IV acyclovir and IV vancomycin on D1, started ampicillin from D2 following positive blood culture.	Expired 4 days after admission
7	10 months Female (2020)	Low grade fever with watery diarrhea of 2weeks duration	Febrile	Unremarkable	WBC- 15000/micL (N-22.5%) Platelets-250000/micL CRP- <5mg/L Blood culture- *Listeria monocytogenes* Stool culture – No growth Urine culture- no growth	IV meropenem was started empirically, continued same for 7 days as the response was satisfactory.	Discharged with full recovery
8	74 yrs Female (Nov 2022)	Fever and diarrhoea for 3 days. History of consumption of various dairy products daily	Febrile	Carcinoma breast, on chemotherapy	WBC- 770/micL (N-74%) ESR – 120/1hr, CRP-78mg/L Blood culture- *Listeria monocytogenes*	IV ceftriaxone was started empirically and IV ampicillin was added following positive blood culture and continued for 7 days. .	Discharged to the ward following recovery after 3 days of ICU care

Case 8 describes acute gastroenteritis of a female patient on chemotherapy for breast carcinoma who received ICU care on admission due to disease severity.

Discussion:

Listeria, despite being an uncommon organism to affect a healthy population, is capable of causing a wide spectrum of illnesses in susceptible individuals. It accounts for the 3rd most common organism for acute bacterial meningitis in adults (1). Those who present with *Listeria* meningitis from the susceptible group exhibit classical signs of meningitis, including fever, neck stiffness, headache, altered level of consciousness and neurological deficits which are similar to meningitis caused by other organisms (2). However, they exhibit significantly lower meningeal signs when compared to meningitis caused by other pathogens (3). Other than acute meningitis, it also can cause meningoencephalitis, cerebritis, rhombencephalitis and intracranial abscess. *Listeria* meningitis is rarely seen among healthy individuals and may present with atypical symptoms or may be completely asymptomatic (4).

Literature describes several studies regarding *Listeria* meningitis in immunocompetent individuals too. Study done by Caplan et al in Romania showed a high frequency of immunocompetent young adults diagnosed with *Listeria* meningitis most probably secondary to ingestion of contaminated food products (5). So this should be considered as a differential diagnosis in those with atypical presentation, who do not improve despite being on a classical treatment regimen, regardless of age and previous medical comorbidities. Similar to the above case, contaminated dairy products might have been the probable source of infection in 2 of our cases also.

Brebenariu et al (6) also described a case of listeria meningitis in a previously healthy adult and the exposure was occupational. In contrast to above presentations of acute meningitis Tiri et al described a case of *Listeria monocytogenes* brain abscess in an immunocompetent adult (7).

Similarly, Case 4 describes *Listeria* meningitis in a boy with thalassemia trait and otherwise healthy and the possible exposure was close contact with a large number of sick pigeons at home. Atypical presentation combined with delayed diagnosis led to delaying of starting appropriate antibiotics thus leading to treatment failure.

Lung infections with *Listeria monocytogenes* are sporadic and only few case reports can be found in the literature. In our case 2, high-resolution computed tomography (HRCT) findings revealed bilateral atypical pneumonia significantly in lower lobes which were highly vascularized. This was consistent with hematological spread rather than inhalation. Theocharis et al also describes an invasive case of pulmonary infection with listeriosis in a patient with rheumatoid arthritis and a history of splenectomy, where patient died within 48hrs despite being on appropriate antibiotics and intensive supportive care (8).

Treatment of choice of *Listeria* meningitis remains ampicillin or meropenem according to the national antibiotic guidelines of Sri Lanka. But some studies also show other antibiotics such as vancomycin, gentamicin, linezolid and quinolones to be effective against *Listeria* meningitis. However, lack of clinical data on this makes it difficult to go for strong recommendations (1). In our case series all patients responded well to Meropenem, but response to ampicillin was poor in a few.

Some patients received dexamethasone for 48hrs of duration initially, and the impact of dexamethasone is controversial. Case study done by Bronner et al shows that dexamethasone reduces overall hearing loss and other neurological sequelae without any effect on overall mortality (9). A study done by Van de Beck et al shows significant reduction in both mortality and neurological sequelae (10).

Acute self-limiting febrile gastroenteritis in a healthy population is one of the commonest presentations of *Listeria monocytogenes*. Common clinical symptoms include fever, watery diarrhea, nausea, vomiting, abdominal pain and headaches. Gastric acidity is protective against Listeria and thus people on H2 antagonist are having increased prevalence of the infection (11). But rarely it can cause invasive disease with positive blood cultures which can lead to severe sepsis and death.

Case 7 and 8 describe uncomplicated acute gastroenteritis with positive blood cultures. Timely diagnosis and accurate antibiotic therapy lead to full recovery in both patients despite one being immunocompromised elderly who received ICU care on admission.

Conclusions:

High clinical suspicion, early presumptive microbiological diagnosis using the simple available biochemicals, with timely initiation of proper treatment regimens remain the pillars of successful treatment in *Listeria monocytogenes* infections. By presenting this case series we aim to raise the awareness of *Listeria monocytogenes* as a possible cause of a wide range of clinical entities including bacterial meningitis, atypical pneumonia and acute gastroenteritis in immunocompromised as well as in immunocompetent patients, and to emphasize use of meropenem and ampicillin as successful treatment options. *Listeria* being a foodborne pathogen serves as a reminder to implement possible efforts to ensure safety of food supply as well.

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Advantages of combining 1,3- β-D glucan assay with *Pneumocystis jirovecii* polymerase chain reaction to improve diagnostic accuracy of pneumocystis pneumonia

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Pneumocystis pneumonia (PCP) caused by *Pneumocystis jirovecii* is an opportunistic pulmonary fungal infection in those with reduced cell-mediated immunity with low CD4+ T cell counts especially those with HIV infections (1).

Pneumocystis are ubiquitous extracellular organisms found in the lungs of mammals and *P. jirovecii* infects humans (2). The life cycle of the organism is divided into three distinct forms: ascus, ascospores (intracystic bodies) and trophic forms.

The disease has a global distribution. The infection is acquired via inhalation. The clinical disease can be either due to reactivation of latent infection acquired during childhood, due to primary infection or due to re-infection. The disease is typically well controlled by an intact immune system and disease occurs in those with prior significant immunosuppression (2). Risk factors include HIV infection with low CD4+ T cell counts and other non-HIV related risk factors like old age, haematological or solid malignancies, solid organ transplant recipients, autoimmune inflammatory diseases like SLE, immuno-suppressive agents like glucocorticoids, methotrexate, cyclosporine, tacrolimus and biological agents such as infliximab (3,4).

Clinical manifestations

Patients presenting with PCP can have subtle or obvious signs of illness. It is stated that patients with HIV have an indolent course with symptoms that include dry, non-productive cough, low grade fever, and progressive dyspnoea (5). In contrast those not infected with HIV have a more abrupt onset of similar symptoms with associated respiratory distress and failure. PCP is an AIDS defining illness and history should elicit HIV infection and current use of HAART. History may be suggestive of an undiag-nosed and underlying HIV infection with signs and symptoms such as weight loss, fatigue, myalgia/arthralgia, rash and headache. There are no classical physical examination findings that are specific to PCP but could include rhonchi, crackles, tachycardia, tachypnoea and exertional dyspnoea (5).

Historical significance

In the early 20th century, Carlos Chagas first identified *Pneumocystis jirovecii* as a protozoan. Much later in 1988 due to a phylogenetic linkage to the fungal kingdom the organism was reclassified as a fungus (6).

Investigations and diagnosis

The diagnosis of PCP is dependent mainly on clinical manifestations, patient history, laboratory results and radiological findings (7). *Pneumocystis jirovecii* is extremely difficult to culture (6). For confirmation and definitive diagnosis of PCP respiratory specimens are stained using GMS, Giemsa, Calcofluor white and Toluidine blue stains and observed via microscopy for visualization of the stained organism (7).

However, it should be noted that these traditional methods lack sensitivity due to reader variability and the quality and type of specimens. Furthermore, when there is a low fungal burden such as in HIV negative patients and those taking prophylaxis for PCP, microscopic diagnosis can be falsely negative (6).

The cyst form of the organism is stainable with Giemsa and Wright stains however these cannot be used to stain the cyst wall. Other stains like toluidine blue O (TBO), Gomori-methenamine-silver (GMS), calcofluor white (CW) can stain the cell wall of the cyst as well. Both live and dead cysts will get stained with the above stains. The trophozoite form is usually not used for diagnosis due to the small size and non-specific pattern of staining. The cyst form is used for diagnosis purposes due to the ease of interpretation with minimum of expertise. Higher sensitivity and specificity can be achieved by using immuno-fluorescence stains than conventional staining methods. Immunofluorescence stains can also stain both trophozoites and cysts (6).

Among the other diagnostic methods are Flow Cytometry which can identify *Pneumocystis* by cytometric parameters and detecting flourochromes or monoclonal antibodies to *Pneumocystis jirovecii.* Antibody assays to detect IgM and IgG against *Pneumocystis jirovecii* by utilizing ELISA techniques is a promising diagnostic approach. However, drawbacks include false negativity in HIV/transplant/cancer patients, smokers, COPD patients, IV drug users and false positive results occur in prior clinical infection and subclinical exposure to *Pneumocystis.*

Real time polymerase chain reaction (PCR) and Loop-mediated isothermal amplification (LAMP) are novel techniques with much higher sensitivity than conventional stains and have no cross-reactivity to other fungal species. A sensitivity of 94–100% and specificity of 79–96% are reported with PCR assays in diagnosing definite PCP (microscopically positive PCP) as compared to controls of pneumonia (9). Presence of higher sensitivity is especially valuable in situations where the fungal burden is low. However, there is a lack of specificity in distinguishing disease due to *P. jirovecii* from colonization (9,10). For the diagnosis of PCP, as opposed to conventional PCR a more promising approach is to utilize quantitative real-time PCR assays (9). Nevertheless, there are no consensus on the DNA sequences targeted for PCR and the cut-off values among the users (9).

1,3-β-D-glucan assays

1,3-β-D-glucan (BDG) is a common polysaccharide in cell wall of most fungi (11). Numerous studies have been conducted to assay the clinical significance of BDG to diagnosed fungal infections, particularly PJP. Researchers have found that higher levels of BDG are present in patients having active PJP infection compared with those who are only colonized (9). Additionally, in 64- 87% of patients, this marker is detectable 1-10 days before the onset of clinical and/or radiological signs (12).

A meta-analysis done in 2020 has revealed a pooled sensitivity and specificity of BDG for PJP as 91% and 79% respectively. However, a higher sensitivity was observed in patients with HIV than in patients without HIV (94% vs 86%), with a comparable specificity (83% vs 83%). The low overall specificity may have occurred as a result of presence of other fungal infections, haemodialysis, recipients of immunoglobulin products, coexisting bacteraemia and some medications such as amoxicillin/clavulanic acid (12).

Although both PCR and BDG have high sensitivity, due to the lower specificity, they have a lesser value as individual confirmatory tests. Therefore, several researchers have studied the importance of combining BDG assay with PCR to improve the diagnostic accuracy.

A retrospective cohort study was done by Sejal Morjaria et al, at the Memorial Sloan Kettering Cancer Centre between 2012 and 2015, where adult patients were analysed for PCP using serum BDG and PCP PCR done from bronchoscopy samples. According to this study done in oncology patients, the sensitivity, specificity, positive predictive value and negative predictive value increased when both tests were done in conjunction (13).

Another study has indicated that both BDG and quantitative PCR assays have high accuracy in distinguishing between *P. jirovecii* pneumonia and *P. jirovecii* colonization (9). Additionally, several other studies have observed that the copy number of the specific *P. jirovecii* gene is notably higher in patients with PJP than in colonized patients (14, 15).

Matsumura et al have evaluated the significance of positive BDG assays combined with a positive PCR to predict the 30-day mortality. Patients with probable PJP infection despite having negative microscopy were included in the study. The pooled 30-day mortality rate was 21.6%. In the studied cohort, the mortality rates among patients testing positive for BDG (10.1%) and PCR-positive patients (15.0%) were notably lower than among those testing negative for BDG (28.1%) or PCR-negative patients (30.1%). Their findings suggest that a positive *Pneumocystis* PCR or BDG test could serve as a predictor of survival in patients with possible PJP infection as they are more likely to receive appropriate treatment (16).

Invasive respiratory tract samples such as bronchoalveolar lavage fluid (BAL) is commonly used as a specimen for PCR while serum, a minimally invasive specimen is used for BDG (10). In situations where obtaining invasive samples is not feasible, BDG assay alone may be superior to traditional microscopic techniques (16).

A study was done by Lahmer T et al, among non-HIV, immunocompromised patients with acute respiratory distress syndrome (ARDS) between 2014 to 2015 in Germany. This study revealed that, serum BDG levels were high in PCP patients with substantial negative predictive value. It highlights the importance of combining serum BDG assays with PCR in PCP patients even in the non-HIV cohort of immunocompromised patients (17).

PCR and BDG assays are used widely in many countries to diagnose PCP. In the backdrop of rising immunocompromised population, establishing these two diagnostic assays in Sri Lanka will prove beneficial in effective management of patients

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Antiviral resistance in cytomegalovirus (CMV) among transplant recipients and novel therapeutic options– A narrative review

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Abstract

Cytomegalovirus (CMV) is a pathogen causing significant morbidity and mortality in haematopoietic stem cell transplant (HSCT) and solid organ transplant (SOT) recipients. Valganciclovir (VGCV) and ganciclovir (GCV) have been used widely for the treatment and prevention of CMV infections for a long time. The development of resistance to these and some of the other newer anti-CMV agents is an issue with significant concern. Resistance testing for CMV is routinely not available in Sri Lanka. This review aims to discuss antiviral resistance in CMV and newer antivirals for CMV. Also, we outline the development and management of resistant CMV infections, including timely virological testing. We discuss newer anti-CMV treatment options including maribavir, letermovir and adoptive T-cell therapy in HSCT and SOT recipients.

Introduction

CMV is an important pathogen causing significant morbidity and mortality in patients undergoing HSCT and SOT. There are two main strategies in preventing CMV disease among transplant recipients. One is prophylaxis with low-dose anti-CMV drugs such as VGCV for a variable period and the other is CMV viral load monitoring with pre-emptive therapy. A novel anti-CMV drug letermovir is now used routinely for CMV prophylaxis in sero-positive HSCT patients [1].

Despite these successful strategies, CMV disease occurs in up to 50% of high-risk SOT patients such as in CMV sero-positive donor/CMV sero-negative recipients (D+/R−) and 17% of CMV-sero-positive recipients (R+) [2]. First-line treatment for CMV disease is GCV or VGCV.

Drug resistance is defined as a viral genetic alteration that decreases susceptibility to one or more antiviral drugs [3], It has been reported that resistance occurs in 5%−12% of SOT recipients after ganciclovir therapy [4] and in 1%−5% HSCT recipients [5]. As the number of drugs available for the treatment of CMV disease is limited and as second-line anti-CMV drugs are more toxic, drug resistance has a significant impact on the outcome of both the patient and the graft.

Incidence and factors associated with the development of resistance

Antiviral drug exposure for a prolonged period together with ongoing viral replication are key requirements for the development of drug resistance. This is seen commonly among D+/R− transplants, patients on strong immunosuppressive therapy and patients who received suboptimal treatment [6,7].

Reduction of the dose of the antiviral drug despite ongoing viraemia was shown to be associated with a significant risk of GCV resistance [8]. Therefore, treatment doses of GCV/VGCV should be continued until the eradication of viraemia and resolution of CMV disease [3].

Reduction of the dose of the antiviral drug despite ongoing viraemia was shown to be associated with a significant risk of GCV resistance [8]. Therefore, treatment doses of GCV/VGCV should be continued until the eradication of viraemia and resolution of CMV disease [3].

The incidence of drug resistance, especially for GCV/VGCV, varies among different types of transplants. Highest rates (31%) are reported for multi-visceral and intestinal transplant recipients [4]. .D+/R- renal transplants on GCV/VGCV prophylaxis have shown a lower incidence, of 0% -3%, in one study[9]. The incidence of resistance for second-line anti-CMV drugs such as foscarnet and cidofovir is less well studied.

Clinically suspecting drug resistance

Clinical suspicion of drug resistance is crucial, not only to consider changes in the treatment regimen but also to make the optimal use and timing of resistance testing.

There are two important indicators for suspecting drug-resistant CMV in a patient on treatment for CMV viraemia [2,3].

1. The patient should have a history of prolonged drug exposure (≥6 weeks of cumulative exposure).

2. Rising or sustained CMV viral load despite ≥2 weeks of optimal treatment Clinicians must rule out factors such as poor absorption, poor compliance and suboptimal dosing.

The presence of drug resistance should be confirmed in clinically suspected cases as above, with CMV genotypic resistance testing. This is usually done by sequencing the genes of interest. Successful sequencing requires samples with a minimum viral load of 1000IU/ 10].

Mechanisms of resistance

Resistance to a drug evolves to counteract its mechanism of action. Drug resistance to GCV/VGCV mainly occurs through mutations of UL97 phosphotranferase gene and UL54 polymerase gene.

In patients treated with GCV/VGCV, UL97 phosphotransferase gene mutation occurs first in most of the patients [10-12]. Phosphotransferase is essential for the phosphorylation of the drug to its active form. There are seven common mutations occurring in the UL97 gene (M460V/I, H520Q, A594V, L595S, C603W, and C592G) which are detected in over 80% of cases of resistance[2,3].

The other important mutations occur in the UL54 DNA polymerase gene which interferes with the action of the drugs as DNA chain inhibitors. UL54 mutations tend to occur in the conserved regions and frequently confer cross-resistance to agents such as foscarnet and cidofovir, which also act on DNA polymerase, inhibiting DNA chain formation [3].

The resistance level is expressed as an increment in the drug concentration that reduces viral growth by 50% (EC50). This is determined by virus growth in a serial dilution of the drug using recombinant phenotyping techniques. Testing laboratories will use this already available data when interpreting sequencing results for known mutations. For GCV, EC50 increases of two-fold to five-fold may be considered as low-level resistance, fivefold to 15-fold considered as moderate-level resistance (usually a single UL97 mutation) and > 15-fold considered as high-level resistance (that suggests the combined effect of UL97 and UL54 mutations)[2,3].

When there are multiple mutations, the overall drug susceptibility will significantly reduce as

When there are multiple mutations, the overall drug susceptibility will significantly reduce as a result of the cumulative effect. For unknown mutations, it could be challenging to determine whether it is resistance related, due to the unavailability of documented recombinant phenotyping data.

Mutations in the UL56 gene and more rarely in UL89 and UL51 genes confer resistance to letermovir [13].

Management of drug-resistant CMV

CMV with UL97 mutations conferring low levels of GCV resistance may be managed with GCV dose increment of up to 10 mg/kg every 12 hours if severe disease is not present [14]. Host factor modifications such as reduction of immunosuppression should be attempted when possible. Close monitoring for bone marrow suppression and renal function is crucial. Therapeutic drug monitoring may be useful in predicting toxicity.

Changing to foscarnet is recommended in the presence of high-level GCV resistance, or combined resistance with UL97 and UL54 mutations [7]. Foscarnet has significant metabolic and renal toxicities which need close monitoring. Cidofovir may be considered when there is dual resistance to GCV and foscarnet without cidofovir resistance. Again, renal toxicity could be a major limitation. Furthermore, the development of relapse of viraemia and the emergence of new cidofovir resistance mutations has been documented in the literature [15].

Novel therapeutic options for cmv

Due to the limitations of the second-line antivirals as discussed above, novel therapeutic agents with safer profiles are being developed to combat this challenge.

• Maribavir

Maribavir, a benzimidazole nucleoside was approved by the Food and Drug Authority of the United States (US-FDA) in 2021 for the treatment of drug-resistant or refractory CMV infection or disease in post-transplant patients. It is also approved in the European Union (EU), the United Kingdom (UK), Canada and Australia. It inhibits UL97 viral kinase affecting viral replication, encapsidation, and release [1]. In phase III trials, maribavir 400mg twice daily used for resistant or refractory CMV infections in SOT or HSCT recipients, has shown superior effects at 8 weeks compared to GCV, foscarnet, cidofovir, or combined antivirals. Moreover, treatment-related side effects such as myelosuppression and nephroto-xicity have been comparatively lower [1,16]. However, it has not been effective in preventing CMV disease in allogeneic HSCT recipients during phase 111 trials [1]. Maribavir is available as an oral formulation with a higher bioavailability than oral GCV, but lower than that of VGCV.

Resistance to maribavir has been documented with mutations in the UL97 gene. T409M and H411Y mutations confer a high-level resistance to maribavir while C480F confers both high-level maribavir resistance and low-level GCV resistance [16].

Maribavir can be considered a useful drug in patients who are unable to tolerate the older agents, given the promising safety profile and the availability of an oral formulation. Some evidence suggests the use of maribavir in combination with other anti-CMV agents (excluding GCV/VGCV) in complicated refractory CMV disease as salvage therapy [17]..

- **Letermovir**

Letermovir is another novel antiviral which received approval from the US-FDA in 2017 for the prevention and treatment of CMV infection after transplantation. It is also approved and used in many other countries including the EU and UK. It inhibits the CMV DNA terminase complex (coded by the genes UL51, UL56, and UL89) which is required for viral DNA processing and packaging.

Letermovir is highly specific to CMV, with 1000-fold higher potency compared to GCV [18].

Letermovir is usually well tolerated, without myelosuppression and nephrotoxicity [18]. Both oral and intravenous formulations are available.

Several real-world studies are available to support the use of letermovir in preventing CMV reactivation in adult CMV-seropositive HSCT recipients. However, evidence of delayed T cell reconstitution attributed to letermovir has led to the assumption of the need for prolonged prophylaxis beyond 100 days [18].

Resistance to letermovir is primarily due to the mutations of UL56 gene and less commonly in UL89 and UL51 genes [13] encoding the three subunits of the CMV terminase complex. Although uncommon, UL56 mutations are noted to occur sooner than UL54 or UL97 mutations [1]. Newer data also suggests letermovir to have a lower barrier to resistance endangering its usefulness in primary therapy for patients with refractory or resistant disease [18].

The different mechanism of action in comparison to other anti-CMV agents makes letermovir more favorable as an agent for prophylaxis or treatment of multidrug-resistance strains, due to lack of cross-resistance [18]. It is fully efficacious against CMV strains resistant to cidofovir, foscarnet, and GCV [18].

- **CMV-specific activated T-cells**

CMV-specific activated T-cell therapy is another potential alternative treatment for resistant CMV disease. Infusion of an expanded population of CMV-specific T-cells leads to reconstruction of specific viral immunity and therefore, clearing the viraemia. Novel technical approaches such as rapid ex-vivo expansion of virus-specific T-cells, establishment of third-party T cell banks and new T cell isolation methods have helped in its progression [3,19].

However, limited availability of donors, risk of alloreactivity, need for HLA matching, sensitivity of T cells to commonly used immunosuppressants and prolonged produc-tion are limiting factors[19]. Evidence on the efficacy and safety of adoptive T-cell therapy is limited in the clinical setting highlighting the need for further studies [3,19].

Situation in Sri lanka

CMV resistance testing is currently unavailable as a routine diagnostic test in Sri Lanka. One retrospective study done on 12 patients who were not responding to GCV therapy for 2-3 weeks, did not find any resistance associated with mutations of the UL97 gene [20]. In this study, it was not mentioned whether these patients were exposed to prolonged use of the drug for more than 6 weeks. There are no other published data on CMV drug resistance in Sri Lanka. Cidofovir and foscarnet are made available on named-patient-basis but none of the novel antivirals are currently registered.

Conclusion and recommendations

Drug-resistant CMV is a grave concern for transplant recipients. Timely testing and interventions including the use of second-line anti-CMV drugs would improve the outcome. In Sri Lanka, the establishment of diagnostic facilities and further research should be actively encouraged.

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Strongyloidiasis in Sri Lanka: A brief review of the literature

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Introduction

Strongyloidiasis, caused by organisms of the Strongyloides genus, primarily Strongyloides stercoralis, is a soil-transmitted helminth infection. The prevalence of this condition is often underestimated, with recent statistical modelling indicating that over 600 million individuals are globally infected (1). Transmission to humans occurs through the penetration of filariform larvae into the skin. These larvae travel through the bloodstream to the lungs, where they penetrate alveoli and ascend the bronchial tree. After being coughed up, swallowed, and entering the small intestine, larvae develop into adults, embedding themselves in the submucosa. Eggs are laid within the submucosa, and hatched rhabditiform larvae penetrate the small intestine, being excreted in faeces or developing into filariform larvae to initiate autoinfection. The practice of open defecation and walking outdoors without wearing footwear is recognized as being linked to the transmission of disease. Dogs are considered a likely zoonotic reservoir for the parasite.

The S. stercoralis life cycle exhibits unique features, including both parasitic and free-living cycles, the ability to multiply through parthenogenesis, and auto-infective capabilities, both internally and externally. Parthenogenesis and autoinfection contribute to the build-up of the parasite population within the human body, in the absence of an external reservoir, sustaining chronic infection. While most infections are asymptomatic, strongyloidiasis is a recognized cause of watery diarrhoea. Symptoms such as altered bowel movements, abdominal pain, nausea, and dermatological manifestations such as larva currens, a pathognomonic feature of external autoinfection, may be present. Respiratory symptoms can also arise due to the pulmonary migration of larvae.

In the presence of immunosuppression, an unprecedented increase in parasite load may lead to hyper-infection and disseminated disease, constituting severe strongyloidiasis. Despite its significance as an opportunistic infection with potential mortality and morbidity, the disease remains neglected, particularly in the Sri Lankan setting. This manuscript aims to provide an overview within the Sri Lankan context.

Review of the literature on strongyloidiasis in Sri Lanka

In 1983, the initial documentation of strongyloidiasis in Sri Lanka involved two cases characterized by profuse watery diarrhoea (2). Both cases exhibited a positive direct smear for abundant rhabditiform larvae, and the parasites were successfully cultured using the Harada-Mori technique. Moreover, the Strongyloides indirect hemagglutination assay indicated a titre of 1:32. One of the patients, afflicted with peripheral vascular disease and a severe alcohol addiction, showed clearance of larvae in stool post-treatment. However, despite this improvement, his overall health deteriorated, leading to demise three months later. As autopsy was not conducted, the contribution of the parasite to his death remains uncertain. The second patient, without any identified underlying medical condition, required multiple courses of thiabendazole treatment for larval elimination.

Subsequent to the initial cases, isolated occurrences of strongyloidiasis have been documented in diverse patient groups. These include individuals with end-stage renal disease (3,4), patients subjected to steroid therapy for conditions such as borderline lepromatous leprosy (5) and pemphigus vulgaris (6), children receiving treatment for malignancies (7), and even among immunocompetent hosts (8). Notably, severe cases of strongyloidiasis have been reported among Sri Lankan immigrants (9) and returning foreign nationals after visiting Sri Lanka (10).

Research on strongyloidiasis is limited, leading to a lack of readily available data on its prevalence in Sri Lanka (11). Reported prevalence rates include 0%, 0.5%, and 1.6% among children and women in the plantation sector, children in the Jaffna municipality, and children admitted to the paediatric unit at Jaffna Teaching Hospital, respectively (12,13,14). The diagnostic test conducted was the direct faecal smear.

Additionally, a study documented a prevalence of 0.9% among children undergoing anti-cancer chemotherapy (15). Another investigation involving institutionalized adults in 2006 reported a prevalence of 3%, in contrast to 0% among the control group using culture methods. (16). The same study reported a prevalence of 9.7% in adult patients with end-stage renal disease and post-transplant, and a prevalence of 11.5% among adult patients with malignancies using culture methods (16). Molecular diagnostics for S. stercoralis were first introduced in 2020 (3).

Subsequent research conducted in 2022-2023 among immunocompromised patients revealed 0.625% culture prevalence as compared to a 11.38% molecular prevalence. Interestingly, out of faecal samples of 21 patients with end stage renal disease subjected to conventional PCR, six patients were found to have S. stercoralis DNA (17), which may be of significant knowledge in a country inundated with end stage renal disease.

Challenges for the diagnosis of strongyloidiasis in Sri Lanka

Throughout history, although strongyloidiasis has been a largely neglected disease, it was named as a neglected tropical disease by the World Health Organization only in 2020 (18). This is partly due to the fact that diagnosis of strongyloidiasis is difficult, largely due to the absence of a diagnostic technique of choice. Eggs are not usually excreted in strongyloidiasis, thus making the examination of the direct smear unreliable. Culture techniques although simple, are time consuming, cumbersome and could be unpleasant to the handler. PCR, although sensitive, are expensive. Serology, though sensitive, is less specific in the endemic settings due to the presence of cross reactions due to false positives (19).

In Sri Lanka, epidemiological data pertaining to strongyloidiasis is lacking. The reduction of prevalence of soil transmitted helminthiases, especially hookworm disease, which is also transmitted via skin penetration by filariform larvae, may also indicate that the prevalence of strongyloidiasis is low. This could be attributed to the routine deworming programmes targeting children and pregnant mothers, as well as the overall improvement of sanitation and hygiene. It is noteworthy mentioning that a century ago, Sri Lanka had a prevalence of >90% for hookworm disease (20), whereas in 2017, it was 0.29% among primary school children (21).

On the other hand, in contrast to ascariasis and trichuriasis, the burden of hookworm disease would be greater in adults compared to children, and since adults are rarely sampled in these surveys, it is likely that hookworm disease as well as strongyloidiasis may have been missed. Moreover, the diagnostic techniques used to survey the soil transmitted helminthiases such as Kato-Katz and the direct smear are not suitable for the diagnosis of strongyloidiasis. The widely cited prevalence of 0-1.6% prevalence of strongyloidiasis can be attributed to the low sensitivity of the direct faecal smear. Similarly, the low culture prevalence as compared to the higher molecular prevalence in 2022, can be attributed to the reduced sensitivity of conventional culture techniques due to intermittent excretion of the parasite. Collecting multiple faecal samples is essential for reducing the likelihood of false negatives and enhancing sensitivity (17). However, acquiring even a single faecal sample proves challenging, let alone obtaining multiple samples from patients.

This challenge is underscored by the response rate, which was less than 2/3 in two studies conducted in 2006 and 2022, even after adequate counselling (16,17).

The diminished prevalence of low culture in 2022, in contrast to the levels observed in 2006, can be attributed to various factors. Firstly, a potential decrease in parasite prevalence may be linked to improvements in hygienic and sanitary conditions, as outlined previously. Secondly, the omission of the high-risk population, particularly individuals from hill country areas, in the second study is a consequence of pandemic-related restrictions and economic challenges. Additionally, the more advanced state of regional health services compared to fifteen years ago has contributed to the diminished need for individuals to travel to Colombo for treatment (17).

Furthermore, ivermectin, the preferred treatment for strongyloidiasis and a notably safe drug administered in a single oral dose, is not officially registered in Sri Lanka. Additionally, there is limited awareness of strongyloidiasis among both the general public and healthcare professionals, coupled with a lack of well-established diagnostic facilities, even in the national reference laboratory. This deficiency can be attributed to the insufficient breadth of research, resulting in a scarcity of epidemiological data that may obscure the prevalence of strongyloidiasis in Sri Lanka.

Way forward

It is imperative to implement cost-effective molecular diagnostic techniques, particularly in major reference laboratories. Additionally, the introduction of straightforward culture-based methods, such as Harada-Mori culture and agar plate culture, to hospital microbiology laboratories is recommended. Clinicians should be encouraged to screen immunocompromised patients and those anticipating immunosuppression for strongyloidiasis. Availability of ivermectin through prescription for treating individuals with the infection is also crucial.

Furthermore, there is a need for more extensive research, especially community-based studies, to ascertain the prevalence of strongyloidiasis in both the general population and immunocompromised individuals. Establishing the zoonotic reservoir is equally important, considering the high prevalence of untreated stray dogs in Sri Lanka. This becomes particularly significant in light of medical advancements leading to an increased number of iatrogenic immunosuppressed patients. Such research endeavours would yield valuable data, assess the magnitude of the problem, enhance diagnostic capabilities, and elevate awareness.

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Case Report

Pseudomonas aeruginosa bloodstream infection with ecthyma gangrenosum in an immunocompetent child

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Introduction

Pseudomonas aeruginosa, a ubiquitous Gram-negative bacterium, is commonly encountered in various environments, including soil, water, plants, and animals. It is a frequent causative agent of Gram-negative bloodstream infections, often associated with healthcare settings and typically affecting immunocompromised individuals. Communi-tyacquired *Pseudomonas aeruginosa* bloodstream infection is a rare occurrence, particularly in immunocompetent individuals, and is associated with significant mortality rates [1].

This case report sheds light on a relatively benign presentation of *Pseudomonas aeruginosa* bloodstream infection (PA BSI), accompanied by an early onset of skin manifestation, ecthyma gangrenosum (EG), which is characteristic of PA sepsis. The scarcity of literature documenting PA BSI in otherwise healthy children, especially in the absence of an evident source of infection, underscores the importance of highlighting this case scenario

Case Report

Fig 1 Purulent nodule on right arm

A four-year-old boy with an unremarkable medical history presented to a tertiary care unit with a three-day history of high-grade fever and a five-day history of cough. His mother noticed a small, purulent nodule on his right arm, along with erythematous swellings on both lower limbs, upon admission. On admission, the child appeared ill and febrile, with tachycardia but stable haemodynamics. Tachypnoea and right-sided crepitations were noted on auscultation, while other systemic examinations were unremarkable.

Fig 2 Erythematous macule on lower limb

Laboratory investigations revealed leucocytosis with neutrophil predominance, with a progressive rise in white blood cell count from $16x10^3$/µl to $45x10^3$/µl within a few days, indicative of sepsis in the blood picture. The initial C-reactive protein level was markedly elevated at 342 mg/l. The chest X-ray demonstrated segmental consolidation in the right lower lobe. The patient was initiated on intravenous amoxicillin-clavulanate; however, due to persistent fever despite two days of antibiotic therapy, blood cultures were obtained.

Fig 3 Growth on blood agar

Nine hours post-incubation, the blood culture flagged positive for Gram-negative bacilli. Subsequently, antibiotic therapy was switched to intravenous piperacillin-tazobactam, and the organism was phenotypically identified as *Pseudomonas aeruginosa* through biochemical testing. Repeat blood cultures confirmed the presence of the same isolate.

The identified strain was susceptible to all tested anti-pseudomonal antibiotics except gentamicin.

Fig 4 Characteristic bluish growth

Swab culture from the purulent nodule yielded the same organism with a similar antibiotic sensitivity pattern, while sputum culture was negative for pathogens. Subsequently, the child's condition improved, and he was discharged after 14 days of treatment. He will undergo follow-up care at the pediatric clinic.

Discussion

Pseudomonas aeruginosa, among the various *Pseudomonas* species, stands out as the most common pathogen causing severe and often life-threatening infections, particularly in immunocompromised individuals. *Pseudomonas aeruginosa* bloodstream infections carry a high mortality rate, estimated at around 60%, making them a significant healthcare concern, especially as the third most common cause of nosocomial Gram-negative bloodstream infections [1,2]. This case illustrates a rare occurrence of PA BSI, likely secondary to community-acquired pneumonia (CAP), in an immunocompetent child with no recent healthcare exposures.

Ecthyma gangrenosum (EG) is a characteristic skin manifestation of *Pseudomonas aeruginosa* infection, resulting from direct inoculation of organisms into the epidermis or hematogenous spread with bacteraemia [3]. Although EG typically progresses from painless erythematous macules to central pustulation and necrosis, our patient did not exhibit central necrosis, leading to the initial misidentification of the lesion as erythema nodosum in *Streptococcal* infection. Hence, maintaining a high index of suspicion for EG, even in the absence of necrotic areas, is crucial for the early initiation of appropriate antipseudomonal treatment.

While EG in the context of PA BSI has been frequently associated with fatal outcomes in the literature [4,5], timely administration of antipseudomonal antibiotics, including combination beta-lactam therapy with an aminoglycoside, likely contributed to the favourable outcome in our patient. Although sputum culture failed to yield any pathogens, the presence of lobar pneumonia suggests a bacterial aetiology, possibly serving as the source of PA BSI. Reported cases of PA BSI in immunocompetent individuals following viral respiratory tract infections further highlight the potential for atypical presentations and emphasize the importance of vigilance in clinical management.

By elucidating the clinical course and management of this rare manifestation of PA BSI in an immunocompetent child, this case report underscores the significance of considering *Pseudomonas aeruginosa* as a potential pathogen in community-acquired infections, particularly when encountering unusual skin manifestations such as ecthyma gangrenosum. Moreover, it emphasises the importance of prompt diagnosis and early initiation of appropriate antimicrobial therapy in improving patient outcomes.

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These should be in the format of introduction / background including the purpose of the study, materials and methods, results, discussion and conclusions. Each manuscript must have a structured abstract of 200 words giving the background, materials and methods, results, discussions and conclusions. The text should be limited to less than 2000 words and 15 references. Discussion should be clear and limited to matters arising directly from the results. The tables and figures (maximum of 2) can be included. The figures should be in black and white.

Articles

These articles should be limited to 1500 words and 12 references. Journal will give priority to articles dealing with topics of interest and importance in microbiology and infectious diseases in Sri Lanka.

Case reports

These should not exceed 750 words and 5 references and should be structured as Introduction, Case report and Discussion. Abstract is not required. Editorial board will be paying attention to the significance of the case report to the practice of microbiology in Sri Lanka.

Abstracts of presentations to be made at Annual Scientific Sessions

These should be limited to 350 words.

Photo quiz

This should be accompanied by a clear photograph and text. Limit your references to three for the answer. (Those submitted without references may be accepted if editors decide as suitable for publication).

Submitting a Manuscript

Manuscripts should be submitted with a cover letter stating: -that the contents have not been published or accepted for publication elsewhere. that the paper has not been submitted simultaneously to another journal.

Cover letter should include a declaration signed by the principal author and co-authors to certify

- the originality of the article.
- that each author has made a significant contribution to the work.
- Principle author and co-authors have read the manuscript.
- abide by the decision of the Editorial Board.

The name, full mailing address, e-mail address and telephone number of the corresponding author should also be included.

Previous publication of

some of the contents of a paper does not necessarily mean that the paper will not be considered for publication in the Bulletin, but the Editorial Board should be made aware of this in the cover letter that accompanies the manuscript.

Plagiarism

The Sri Lanka College of Micro-biologists considers plagiarism as a serious academic misconduct. All submitted work will be checked for plagiarism and any plagiarism (plagiarism score considered acceptable should be 20% or less) Identified would be dealt with according to the COPE guideline on plagiarism.**http://publicationethics.org/files/u2/02A_Plagiarism_Submitted.pdf**

Authors

should include all those who have contributed to the work described, including supervisors and if applicable, those interpreting and analysing data used in the study to be presented. Authors should meet all of the following criteria, and be able to take public responsibility for the content of the paper:

1. Conceived and planned the work that led to the paper, or interpreted the evidence it presents, or both.
2. Wrote the paper or reviewed successive versions, and took part in revising them.
3. Approved the final version.
4. Each author should have contributed sufficiently to the work to take public responsibility for the content.
5. Contributed to the intellectual content of the paper.
6. At least one of the authors of the paper should be a member of SLCM. Collecting and assembling data reported in a paper and performing routine investigations are not, by themselves, criteria for authorship.

PREPARATION OF MANUSCRIPTS

All parts of the manuscript, including references, tables and figure legends should be typed with double-spacing and formatted in Times New Roman font (size 14 for the title and 12 for the rest of the article) for A4 sized paper. All pages of the manuscript should be numbered consecutively, starting with the title page.

The title page should contain the following:

- Main title and subtitle (if any): capital letters should be used only for the first letter in the first word in the title and proper nouns. (Use Times New Roman font size 14, bold).

- Name(s) of the author(s) should be given below the title. The author's surname should be preceded by the initial(s) or forename(s) but not by prefixes such as Mr. or Dr. or Prof. See above for guidelines regarding authorship. The name of the principal author should be stated first. Authors' names will be published in the order submitted by the principal author.

- Institutional affiliations of authors have to be mentioned below the list of authors identifying each author with a number in superscript after the name and the same number in superscript before the name of the institution.

- Contact details of the principal / corresponding author including the e-mail address should be mentioned below the list of institutions.

Units/ abbreviations

Authors should follow the SI system of units (except for blood pressure which will continue to be expressed in mmHg). Abbreviations if used should be consistent throughout the text.

Photographs

All photographs of the patients will be published with covered eyes. Photomicrographs should have scale markers that indicate the degree of magnification.

Tables

All tables must be double-spaced and numbered with Arabic numerals in the order in which they are cited in the text. The title should describe the contents of the table briefly and concisely. Explain all abbreviations and symbols as footnotes to the table.

Acknowledgements

Acknowledge only persons / organizations who have contributed to the scientific content and provided financial or technical support.

References

These should conform to the Vancouver style. The reference in the text should be numbered consecutively in Arabic numerals in parenthesis in the same line of the text in the order in which they appear in the text. The first five authors should be listed. If there are more than five then the first three should be listed followed by et al. An example is given below.

1. Dellit TH, Owens RC, McGowan JE et al. Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America guidelines for developing an institutional program to enhance antimicrobial stewardship. Clinical Infectious Diseases 2007; 44: 159-77.

PROOF READING

- The manuscript must be proof read by the author prior to submission.

- The acceptable rates for spelling and grammatical errors are as follows.

* Spelling mistake – 5% (e.g. in a 2000-word document up to 10 misspelled words will be allowed)

* Grammatical errors – 5% (e.g. in a 2000-word document up to 10 grammatical errors will be allowed)

● **Please note – failure to comply with the above requirement will result in the rejection of the manuscript.**

Manuscripts should be submitted as an **electronic version** by email to slcmicrobio@gmail.com

Your email should be marked for the attention of the Editor, SLCM, and the manuscript should be attached to the email as a **Microsoft Word document** along with the cover letter.

"The SLCM does not expect hard copies of the same, but you would be acknowledged by a reply email from SLCM. If you do not receive such a reply, please contact & confirm the receipt of your submission from SLCM"

Guidelines for preparing abstracts

(A) Authors

* At least one of the authors of the paper should be a member of the SLCM.
* Authors should include all those who have contributed to the work described, including supervisors and if applicable, those interpreting and analyzing data used in the study to be presented. Only persons who contributed to the intellectual content of the paper should be listed as authors. Authors should meet all of the following criteria, and be able to take public responsibility for the content of the paper:

* Conceived and planned the work that led to the paper, or interpreted the evidence it presents, or both.

* Wrote the paper or reviewed successive versions, and took part in revising them.

* Approved the final version.

* Each author should have contributed sufficiently to the work to take public responsibility for the content.

* Collecting and assembling data reported in a paper and performing routine investigations are not, by themselves, criteria for authorship

The principal author should sign the statement given in **Form A** to certify that

* The paper is an original research and each author has made a significant contribution to the work.

* The titles of articles, names and affiliations of authors to be published has been submitted to the Sri Lanka College of Microbiologists by the principal or corresponding authors.
* All those who have contributed significantly to be considered as authors is included.

* Editorial Board of SLCM is not responsible for typographical errors.

* Registration – The principal author should register for the sessions (at least day registration). If the principal author is not the presenting author, both the principal author and the presenting author should register for the sessions (at least day registration).

(B) Title page

* Name (s) of the author(s) and the place(s) where the research has been carried out with the title of the abstract should be given in the title page. Authors surname should be preceded by the initial(s) but not by prefixes such as Mr. or Dr. or Prof.

* The name of the principal author should be stated first. Authors' names will be published in the abstract book in the order submitted by the principal author.

* Title: The title should be brief but sufficiently descriptive of the study reported. Capital letters should be used only for the first letter in the first word in the title and for proper nouns.

* Address: The address of the institution in which the work was carried out should be included. If the collaborators are from different institutions, their institutional affiliations have to be mentioned below the list of authors identifying each author with a number in superscript after the name and the same number in superscript before the name of the institution.

* **Title:** The title should be brief but sufficiently descriptive of the study reported. Capital letters should be used only for the first letter in the first word in the title and for proper nouns.

* **Address:** The address of the institution in which the work was carried out should be included. If the collaborators are from different institutions, their institutional affiliations have to be mentioned below the list of authors identifying each author with a number in superscript after the name and the same number in superscript before the name of the institution.

(A) Abstract

Abstracts of research papers

* The abstract must report the results of original research. If the work has been presented or published previously in whole or in part, the year of presentation or publication and the forum or journal should be stated in the abstract. This does not disqualify a paper. Work already presented/ published in Sri Lanka will only be considered for poster presentations.

* Abstract page should carry only the title and the text. (It should not contain Name(s) of the author(s) and place(s) where research has been carried out)

* The abstract (including the title) should not exceed 350 words.

* In order to maintain uniformity all abstracts should be structured into the following

(i) A brief introduction may indicate why the study was undertaken
(ii) Objective(s)
(iii) Design, setting and methods (include statistical methods where relevant)
(iv) Results
(v) Conclusions

Prospective authors are requested to see the abstracts of research papers in a recent issue of the CMJ for further guidance on writing abstracts.

Abstracts of Case reports

* If Case reports are submitted, in order to maintain uniformity, they should be structured as
  - o Introduction,
  - o Case report and
  - o Discussion.

* Case reports will be considered for poster presentations only.

Common guidelines for all abstracts

* References should not be included.
* Where units are used, they should be in SI units, and abbreviation of units should follow standard practice.

* Tables: should be included only if absolutely essential.

* Diagrams / Chemical structures: should be included only if absolutely essential.

Only one table or one diagram will be allowed per abstract.

* The Abstract must not contain statements such as “Results will be discussed”.

* **Acknowledgements:** Should be restricted to Agencies/ Institutions providing funding or

sponsorship and should be in the form, “Financial assistance by ……. for research grant (number) is acknowledged”.

* Abstracts will be reviewed by the Editorial Board, two reviewers and by a third reviewer in case of any arbitration.

* The Council of The Sri Lanka College of Microbiologists retains the right to select reviewers.

* The decision of the reviewers will be final.

* All changes recommended by the reviewers should be made before the abstract is finally accepted.

* Names cannot be changed once it has been accepted for presentation.

* Declaration by Authors – The Principal Author must complete the Form A with each abstract submitted.

* All correspondence will be addressed to the Principal Author.

(A) FORMATTING

Manuscripts should be formatted in Times New Roman font size 12, with 1.5 spacing and the title should be in the same font size in bold type.

(B) PROOF READING

*The manuscript must be proofread by theauthor prior to submission.

* The acceptable rates for spelling and grammatical errors are as follows.

    * Spelling mistake – 5%
    * Grammatical errors – 5%

****Please note – failure to comply with the above requirement will result in the rejection of the manuscript***.

(A) SUBMISSION

* **The title page and abstract** should be sent **only as an electronic version** following the “Guidelines for preparing abstracts” to slcmicrobio@gmail.com The completed Form A should be submitted as a hard copy to the office of the Sri Lanka College of Microbiologists.

* All documents pertaining to the presentation must be submitted on or before **28th of February of the year.**