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The Bulletin
of The
Sri Lanka College of Microbiologists
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The Sri Lanka College of Microbiologists
Council 2021 / 2022

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Standing (L — R) : Dr. Samanmalee Gunasekara, Dr. Madhumanee Abeywardena, Dr. Roshan Jayasuriya, Dr. Nadeeka Janage, Professor Nadira Karunaweera, Dr. Rohitha Muthugala, Dr. Bhagya Piyasiri, Dr.Kishani Dinapala

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The Sri Lanka College of Microbiologists

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

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31st Annual Scientific Sessions
of
The Sri Lanka College of Microbiologists

"The role of clinical microbiologist within clinical governance framework: From blueprint to reality"

Inauguration Ceremony

24th August 2022 at 6.15pm
"Grand Ballroom"
Ariyana Reach Hotel
Maharagama

Pre-Congress Workshop

"Quality and safety in healthcare: overcoming challenges"
24th August 2022

Scientific Programme

25th and 26th August 2022
"Grand Ballroom"
Ariyana Reach Hotel Maharagama

Post-Congress Workshop

"Managerial Leadership Excellence – an Interactive Training"
27th August 2022
"Lionel Memorial Auditorium"
Sri Lanka Medical Association
Colombo 07

MESSAGE FROM THE CHIEF GUEST

I am pleased and privileged to have been invited as the Chief Guest at the inauguration of the 31st Annual Scientific Sessions of the Sri Lanka College of Microbiologists. It is gratifying to note that Colleges such as yours, have the courage and commitment to continue with your traditional annual academic sessions despite the prevailing unstable conditions in our country, and the organizers should be congratulated. I sincerely hope the situation would improve by the time of the sessions.

The members of the Sri Lanka College of Microbiologists, I believe, would have played an important role during the current pandemic, which fortunately seems to be quiescent at the moment. The theme for your academic sessions, dealing with the "Role of the clinical microbiologist within the clinical governance framework: From blue print to reality" will provide a very stimulating topic for deliberations by the participants, given the importance of quality and safety in practice.

I wish the College success in its deliberations at the Academic Sessions.

Professor Anoja Fernando
Emeritus Professor of Pharmacology
University of Ruhuna
Member, UNESCO International Bioethics Committee
Member, National Health Research Council, Ministry of Health

MESSAGE FROM THE PRESIDENT

I am privileged to write this message to the Bulletin of the Sri Lanka College of Microbiologists on the occasion of the 31st Annual Scientific Sessions of the college. Having originated as the Ceylon Association of Microbiologists in 1969 and changed its name to The Sri Lanka Association of Microbiologists in 1974, it evolved to be the Sri Lanka College of Microbiologists in July 1979. The annual tradition of holding scientific sessions has continued uninterrupted over the past 3 decades commencing from 1991, steadily evolving with careful nurturing of respective councils consisting of members with enormous potential, unique capability and capacity.

The theme chosen for this year is “The role of clinical microbiologist within clinical governance framework: From blueprint to reality” and the annual scientific sessions, pre-congress and post -congress workshops have been aligned accordingly. Pre-congress workshop focuses on “Quality and safety in healthcare: overcoming challenges” while the post-congress aims at “Managerial leadership excellence”.

On behalf of the Sri Lanka College of Microbiologists, I welcome you all to this 31st Annual Scientific Sessions which is enriched with 5 plenary lectures, 3 symposia, case based interactive discussions,3 free paper sessions and an e-poster session. I hope it will enable speakers from different parts of the world and participants from Sri Lanka to establish a platform for fruitful collaborations in their future work.

I take this opportunity to thank Professor Anoja Fernando, Emeritus Professor of Pharmacology, University of Ruhuna for accepting our invitations to be the chief guest at the inauguration ceremony. I also thank all our guest speakers, both local and overseas, for having accepted our invitation willingly to share their knowledge and expertise with us in spite of their busy schedules. I extend a special word of thanks to all the college members and the council members who have helped and contributed to the numerous college activities this year to name a few, initiation and completion of the constitutional amendment, revision of National Antibiotic Guidelines, successfully completing procurement training to the first group of members, the commemoration of advocacy days and weeks, having collaborative workshops, initiating discussion on a research grant to a postgraduate trainee doctor for dissertation in MD microbiology, providing expert opinion which guide the delivery of health services to the Ministry of Health and other relevant organizations and also having successful monthly CME presentations followed by discussions. Our website is kept updated with the ongoing events of the college and also the contributions in the form of articles, short write-ups etc. from members on hot topics related to our specialty, by our able web master Dr. Roshan Jayasuriya and Ms. Piume Madushani. In addition to the above one of the very important events in the college calendar, Dr. Siri Wickremesinghe oration this year was titled “To do or not to do –infection prevention and control – Should it be evidenced-based?”. It was delivered by Dr. Kushlani Jayatilleke, Consultant Microbiologist, Sri Jayewardenepura General Hospital, Nugegoda.

I greatly appreciate the efforts of the two secretaries, Dr. Deepa Perera and Dr. Nilushi De Silva, the Editor Professor Neluka Fernando, Treasurer Dr. Sumudu Suranadee and all council members. My sincere gratitude goes to the organizing committee and two college office secretaries Ms. Priyanga Opatha and Ms. Amanda Jayasooriya for their valuable contribution to make this event a success.

An event of this magnitude would not have been possible without the generous contribution of our sponsors. On behalf of the council of the Sri Lanka College of Microbiologists, I would like to give a big thank you to all the sponsors for their valuable contributions during this challenging period.

Dr. Geethika Patabendige

President

Sri Lanka College of Microbiologists

MESSAGE FROM HONORARY JOINT SECRETARIES

We would like to cordially welcome you to the 31st Annual Scientific Sessions of the Sri Lanka College of Microbiologists on behalf of the president and the council of the Sri Lanka College of Microbiologists.

The Sri Lanka College of Microbiologists is the professional organization that represents the Sri Lankan Microbiologists. One of the main visions of the Sri Lanka College of Microbiologists is to improve the academic knowledge and skills of postgraduate trainees and Microbiologists.

The Annual Scientific Sessions is the main academic event of the SLCM and consists of pre-congress, a scientific programme for two days, and a post-congress workshop. The main purpose is to share knowledge in clinical microbiology in local and international contexts. Furthermore, this will give a scientific platform for researchers to bring forward their scientific work.

The theme for the programme is "The role of clinical microbiologist within clinical governance framework: From blueprint to reality". The theme for this year focuses on the pragmatic aspects of clinical microbiology. The sessions aim to enhance the clinical governance of medical professionals concentrating mainly on the quality and safety of health care, communication, and professionalism in addition to lectures and research presentations to address a crucial element in the professional role of the microbiologist.

We would like to express our sincere gratitude to the organizing committee, the college office secretaries, and the sponsors for their valuable contribution to make this event a success.

Finally, we wish all the respected attendees to have an enjoyable and exciting session this year.

Dr. Deepa Perera
Honorary Joint Secretary

Dr. Nilushi De Silva
Honorary Joint Secretary

INAUGURATION PROGRAMME

6.00pm	Invitees take their seats
6.15pm	Arrival of the Chief Guest Introduction of Members of the Council
6.30pm	Ceremonial Procession
6.35pm	National Anthem
6.40pm	Traditional lighting of the Oil Lamp
6.50pm	Welcome Address **Dr. Deepa Perera** Honorary Joint Secretary
7.00pm	Address by the President **Dr. Geethika Patabendige**
7.15pm	Introduction of the Chief Guest By the President **Dr. Geethika Patabendige**
7.25pm	Address by the Chief Guest **Professor Anoja Fernando** Emeritus Professor of Pharmacology University of Ruhuna
7.50pm	Award of SLCM Fellowships
8.35pm	Vote of Thanks **Dr. Nilushi De Silva** Honorary Joint Secretary
8.45pm	Ceremonial Procession leaves
8.50pm	Reception

PROGRAMME AT A GLANCE

Time	25th August 2022	Time	26th August 2022
8.00am – 8.30am	Registration	8.00am – 8.30am	Registration
8.30am – 9.15am	Free paper session 1	8.30am – 9.30am	Free paper session 3
9.15am – 09.45am	Tea	9.30am – 10.00am	Tea
09.45am – 10.45am	Symposium 1 Optimized combined medical and surgical management of skeletal prosthesis	10.00am –11.15am	Plenary 4 Emerging fungal infections
10.45am –11.45am	Plenary 1 Overview on common immunodeficiency case scenarios (PID) in Sri Lanka	11.15am –12.15pm	Symposium 3 Paediatric central nervous system infections
11.45am –12.30pm	Free paper session 2	12.15pm –1.15pm	Plenary 5 Post-COVID syndromes and their management
12.30pm – 1.30pm	Lunch	1.15pm – 2.15pm	Lunch
1.30pm – 2.45pm	Symposium 2 Challenges in haemopoetic stem cell transplantation (HSCT)	2.15pm – 3. 45pm	Interactive session on case scenarios
2.45pm – 3.45pm	Plenary 2 Introduction of multi-disciplinary antimicrobial stewardship (AMS) ward rounds at a tertiary hospital	3.45pm – 4.15pm	Award ceremony and close of conference
3.45pm – 4.30pm	Plenary 3 Diagnosis and mitigation of hospital acquired infection with a special focus on molecular diagnostics	4.15pm	Tea
4.30pm	Tea and end of the day one proceedings		

List of e-Posters

Poster presentations from PP 1 to PP 7 were held as a fully virtual event on 22nd August 2022

PP 1	**Evaluation of diagnostic value of sputum Gram stain and comparison of semi- quantitative and quantitative culture methods in patients treated at Central Chest Clinic** Welagedara PGRUM [1], Karunanayake L[1] [1]Department of Bacteriology, Medical Research Institute, Colombo, Sri Lanka
PP 2	**Distribution of meropenem Minimum Inhibitory Concentration (MIC) amongExtended Spectrum Beta Lactamase (ESBL) producing *Enterobacteriaceae* isolates from a University Hospital in Sri Lanka** Sahly MA[1], Karunaratne HMS[2], Nakkawita WMID[3] [1]British College of Applied Studies, [2,3] Faculty of Medicine, General Sir John Kotelawala Defence University, Sri Lanka
PP 3	**Consumption of carbapenems in a District General Hospital** Wijeweera KDDS, Priyanthi AAD, Liyanage N, Dharmasiri HHKT, Anuruddha HAP District General Hospital Matara, Sri Lanka
PP 4	**Association of haematological and biochemical parameters with different clinical entities in culture positive melioidosis** Piyasiri DLB[1], Jayasundera MCT[1], Mohotti M[1], Sapukotana PM[1], SamarawickramaK[1], Galhena M[1], Priyantha D[1], Thewarapperuma C[1], Corea EM[2] [1]Teaching Hospital Karapitiya, Sri Lanka, [2]Faculty of Medicine, University of Colombo, Sri Lanka
PP 5	**Respiratory virus infections in COVID-19 suspected symptomatic patients in the Central Province of Sri Lanka** Arunasalam S [1], Muthugala R [2], Noordeen F [1] [1]Department of Microbiology, Faculty of Medicine, University of Peradeniya, Peradeniya, Sri Lanka, [2]National Hospital Kandy, Kandy, Sri Lanka
PP 6	**Prevalence of neutralizing antibodies among healthcare workers vaccinated against SARS-CoV-2 at 6 weeks and 6 months following primary course of vaccination in two teaching hospitals** Badanasinghe CN[1], Weerakoon DN[1], Fonseka I[1], Abeykoon M[2] [1]Department of Medical Microbiology, Faculty of Medicine, University of Kelaniya,Sri Lanka, [2]Teaching Hospital Kegalle, Sri Lanka
PP 7	**Incidence of asymptomatic SARS-CoV-2 infections among healthcare workers ata tertiary care hospital in Colombo** Senanayake MS, Arachchige NDS, Dharmasiri AWR, Weerathunga APAI, KaushalyaAGG, Athukorala S, Janage SN Department of Molecular Biology, Medical Research Institute, Colombo, Sri Lanka
PP 8	**First case of COVID-19 associated mucormycosis (CAM) in Sri Lanka- A case report** Pitagampola MN[1], Gunarathna MADP[1], Jayasinghe S[1], Dayaratne M[1], Jayasena KDNUD[1], Welagedara PGRUM[2], Sigera LSM[2], Nanayakkara G[1], Jayasekera PI[2] [1]Teaching Hospital, Ratnapura, Sri Lanka, [2]Department of Mycology, MedicalResearch Institute, Colombo, Sri Lanka

PP 9	**SARS-CoV-2 infection in an immunocompromised patient; reinfection or persistent infection?** Asmir WM [1], Janage SN [2], Wimalaratne KBD [1], Dharmasiri AWR [2], Arachchige NDS [2],De Silva ADP [1], Chathurani PM [1], Sumathipala S [1] [1]Department of Virology, Apeksha Hospital, Mahahragama, Sri Lanka, [2]Department of Molecular Biology, Medical Research Institute, Colombo, Sri Lanka
PP 10	**Complicated left atrial mural endocarditis caused by methicillin resistant *Staphylococcus aureus* – A rare presentation** Liyanage N, Priyanthi AAD District General Hospital, Matara, Sri Lanka
PP 11	**Pneumococcal sepsis with optochin resistant *Streptococcus pneumoniae;* a case report** Jayasundera MCT, Piyasiri DLB, Samarawickrama TKS, Rathnasiri SWRC, Thusharika HPG Teaching Hospital Karapitiya, Sri Lanka
PP 12	**Disseminated *Fusarium* infection in an immunocompromised patient - Successful outcome with combined antifungal therapy** Welagedara PGRUM[1], Somawardana UABP[2], Madarasingha NP[3], Manchanayaka MAN[4], Wijesinghe CN[4], Premathilaka GDI[1], Welagedara PGRIS[1], Sigera LSM[1], Gunasekera SP[4], Jayasekera PI[1] [1]Department of Mycology, Medical Research Institute, Colombo, Sri Lanka, [2]Apeksha Hospital, Department of Haemato -Oncology and Stem Cell Transplantation, Maharagama, Sri Lanka, [3]Apeksha Hospital, Department of Dermatology, Maharagama, Sri Lanka, [4]Apeksha Hospital, Department of Microbiology, Maharagama, Sri Lanka
PP 13	**A case of cerebral aspergillosis in Sri Lanka** Welagedara PGRIS[1], Devakanthan B[2], Sigera LSM[1], Jayasekara PI [1] [1]Department of Mycology, Medical Research Institute, Colombo, Sri Lanka, [2]Department of Microbiology, Teaching Hospital Kurunegala, Sri Lanka
PP 14	**Acute invasive *Aspergillus* rhinosinusitis presenting as multiple cranial nervepalsy: A case report** Wijeweera KDDS[1], Piyasiri DLB[1], Dissanayake A[1], Liyanage D[1], Welendawe S[1], Welagedara PGRUM[2], Sigera LSM[2], Jayasekara PI[2] [1]Teaching Hospital Karapitiya, Sri Lanka, [2] Medical Research Institute, Colombo, SriLanka
PP 15	**Pythium keratitis in an adolescent – A case report** Welagedara PGRIS[1], De Silva SC[2], Sigera LSM[1], Dayawansa KR[2] Jayasekara PI[1] [1]Department of Mycology, Medical Research Institute, Colombo, Sri Lanka, [2]National Eye Hospital, Colombo, Sri Lanka
PP 16	**Case of a Sri Lankan child with Conidiobolomycosis** Abeywardena HMW[1], Ekanayake SD[1], Jayasekera PI[2], Dharmadasa C[3], Welagedara PGRUM[2], Sigera LSM[2], Bandaranayake B[4] [1]Department of Microbiology, Sirimavo Bandaranaike SpeciaAlized Children's Hospital, Peradeniya, Sri Lanka, [2]Department of Mycology, Medical Research Institute, Colombo, Sri Lanka, [3]Department of Histopathology, Sirimavo Bandaranaike Specialized Children's Hospital, Peradeniya, Sri Lanka, [4]Department of Otolaryngology, Sirimavo Bandaranaike Specialized Children's Hospital, Peradeniya, Sri Lanka

Pre-Congress workshop on quality and safety in healthcare: overcoming challenges

24th August 2022

Chairpersons – Dr. Kushlani Jayatilleke and Dr. Rohini Wadanamby

8.00am – 8.25am	**Registration**
8.25am – 8.30am	**Welcome Address** Dr. Geethika Patabendige President SLCM
8.30am – 9.15am	**The use of information technology (IT) to improve the quality of delivering microbiological services** **Dr. Roshan Jayasuriya** Consultant Microbiologist, Additional Approved Analyst, National Institute of Health Sciences, Kalutara, Sri Lanka
9.15am – 10.00am	**Professionalism and communication** **Professor Narada Warnasuriya** Emeritus Professor of Paediatrics, University of Sri Jayawardenapura and Senior Professor of Paediatrics, General Sir John Kotelawela Defence University, Ratmalana, Sri Lanka
10.00am – 10.15am	**Tea**
10.15am – 11.00am	**How to plan research in achieving best clinical effectiveness?** **Professor Enoka Corea** Chair Professor, Department of Medical Microbiology and Immunology Faculty of Medicine, University of Colombo, Sri Lanka
11.00am – 11.45am	**Key determinants of an effective antibacterial agent** **Professor Shalini Sri Ranganathan** Professor in Pharmacology and Specialist in Paediatrics, Department of Pharmacology, Faculty of Medicine, University of Colombo, Sri Lanka
11.45am – 12.30pm	**Biosecurity and bioterrorism** **Dr. Sjors Schulpen** Netherlands Biosecurity Office of the National Institute for Public Health and the Environment, Netherland
12.30pm – 1.15pm	**Clinical governance and risk management in laboratory and healthcare quality** **Dr. Jumoke Sule** Consultant Microbiologist, Clinical Microbiology and Public Health Laboratory, Cambridge University Hospital, NHS Foundation Trust, United Kingdom
1.15pm	Lunch and **end of the session of the day**

Day 1
Scientific programme
25th August 2022

8.00am – 8.30am	**Registration**
8.30am – 9.15am **OP 1**	**Free paper session 1 – Bacteriology, Virology and Parasitology** Chairpersons –Dr. Sujatha Pathirage and Professor Hasini Banneheke **Inward and outpatient department antibiotic consumption in a DistrictGeneral Hospital** Wijeweera KDDS, Priyanthi AAD District General Hospital Matara, Sri Lanka
OP 2	**Incidence of respiratory pathogens other than SARS-CoV-2 detected insymptomatic patients during COVID-19 pandemic** Janage SN, Palipane EG, Dharmasiri AWR, Arachchige NDS, Weerathunga APAI, Senanayake MS, Kaushalya AGG Department of Molecular Biology, Medical Research Institute, Colombo, SriLanka
OP 3	**Chigger mites (Acari: Trombiculidae and Walchiidae) associated withrodents in selected scrub typhus-prone areas in Southern and Westernprovinces of Sri Lanka** Ashani MLS [1], Chandrasena TGAN [2], Gunathilaka PADHN [2], Silva RB [3,4], Jacinavicius FC[3], Premaratna BAHR[1] [1]Deparment of Medicine, Faculty of Medicine, University of Kelaniya, Ragama, Sri Lanka,[2] Department of Parasitology, Faculty of Medicine, University of Kelaniya, Ragama, Sri Lanka, [3] Laboratório de Coleções Zoológicas, Instituto Butantan, São Paulo, SP; Brazil, [4] Departamento de Patologia, Reprodução e Saúde Única, Faculdade de Ciências Agrárias e Veterinárias-UNESP, Jaboticabal,SP, Brazil
9.15am – 09.45am	**Tea**
09.45am – 10.45am	**Symposium 1** **Optimized combined medical and surgical management of skeletal prosthesis** Moderators – Dr. Shirani Chandrasiri and Dr. Dhananja Namalie **Diagnosis and management of prosthetic joint and hardware associatedinfection** **Dr. Yuen Su** Infectious Diseases Physician, Prince of Wales Hospital, Sydney, Australia **Skeletal prosthesis and infection- The story of the foot print** **Dr. K. Umapathy** Consultant Orthopaedic Surgeon, National Hospital of Sri Lanka, Colombo, SriLanka
10.45am –11.45am	**Plenary 1** Chairperson - Dr. Dhanushka Dasanayake **Overview on common immunodeficiency case scenarios (PID) in Sri Lanka** **Dr. Rajiva De Silva** Consultant Immunologist, Medical Research Institute, Colombo, Sri Lanka
11.45am –12.30pm	**Free paper session 2 - Bacteriology** Chairpersons - Dr. Bhagya Piyasiri and Dr. Madhumanee Abeywardena

OP 4	**Molecular detection of selected genetic determinants of carbapenem resistance among invasive isolates of *Acinetobacter baumannii* recovered fromselected tertiary care units in Colombo District, Sri Lanka** Alles MFJ, Corea EM, Gamage S, Jayalatharachchi HR Department of Medical Microbiology and Immunology, Faculty of Medicine, University of Colombo, Colombo, Sri Lanka
OP 5	**Diabetic foot infections due to biofilm forming and other aerobic microbiota in patients presented at the National Hospital of Sri Lanka: A microbiological study** Jayasena RSS, Patabendige CGUA National Hospital of Sri Lanka, Colombo, Sri Lanka
OP 6	**Prevalence of *Staphylococcus aureus* and detection of staphylococcal enterotoxin A among positive culture isolates of *Staphylococcus aureus* in rawpork from retail markets in the Gampaha District, Sri Lanka** Dias WLS [1], Pathirage MVSC[2] [1]Postgraduate Institute of Medicine, Colombo, Sri Lanka, [2]Medical ResearchInstitute, Colombo, Sri Lanka
12.30pm – 1.30pm	**Lunch**
1.30pm – 2.45pm	**Symposium 2** **Challenges in haemopoetic stem cell transplantation (HSCT)** Moderators – Dr. Kanthi Nanayakkara and Dr. Dhammika Vidanagama **Pre-transplant screening, prophylaxis and pre-emptive therapy in HSCT related infections** **Dr. Saranga Sumathipala** Consultant Medical Virologist, Teaching Hospital, Anuradhapura, Sri Lanka **HSCT associated infections and management** **Dr. Gabriela M. Marón Alfaro** Pediatric Infectious Disease Specialist in Memphis, TN | Healthgrades, St. Jude Children's Research Hospital Memphis, Tennessee, United State of America **Challenges in setting up and sustaining a HSCT unit, local perspective** **Dr. Samanmalee Gunasekara** Consultant Clinical Microbiologist, Apeksha Hospital (National CancerInstitute), Maharagama, Sri Lanka
2.45pm – 3.45pm	**Plenary 2** Chairperson – Professor Enoka Corea **Introduction of multi-disciplinary antimicrobial stewardship (AMS) ward rounds at a tertiary hospital** **Dr. Sumita K. Pai** Consultant Medical Microbiologist, Royal Papworth NHS Trust, United Kingdom
3.45pm – 4.30pm	**Plenary 3** Chairperson – Dr. Geethika Patabendige **Diagnosis and mitigation of hospital acquired infection with a special focus on molecular diagnostics** **Dr. Shankar Sengupta** Medical Superintendent & Head of Laboratory Services, Chittaranjan National Cancer Institute, Kolkata
4.30pm	**Tea and End of the day one proceedings**

Day 2
Scientific programme
26th August 2022

8.00am – 8.30am	**Registration**
8.30am – 9.30am **OP 7**	**Free paper session 3-Virology** Chairpersons – Dr. Malika Karunaratne and Dr. Dulmini Kumarasinghe **A descriptive study on prevalence of respiratory viruses in patients with respiratory symptoms during SARS-CoV-2 pandemic in North Central Province, Sri Lanka** Sathgurupathi IUIBM[1], Wanniarachchi KP[2], Liyanapathirana VC[3], Sumathipala S[2] [1]Public Health Laboratory, Regional directorate of Health Services Office, Vavuniya, Sri Lanka, [2]Regional Reference Virology Laboratory, Teaching Hospital Anuradhapura, Anuradhapura, Sri Lanka, [3]Department of Microbiology, Faculty of Medicine, University of Peradeniya, Sri Lanka
OP 8	**Comparison of a rapid antigen test with a point of care rtRT -PCR for thedetection of SARS- CoV-2** Punchihewa PHJP[1,2,3], Iqbal BN[2], Shihab SRM[2,3], Noordeen F[2] [1]Teaching Hospital Peradeniya, Peradeniya, Sri Lanka, [2]Diagnostic and Research Virology Laboratory, Department of Microbiology, Faculty of Medicine, University of Peradeniya, Sri Lanka, [3]Postgraduate Institute of Science, University of Peradeniya, Sri Lanka
OP 9	**Longitudinal evaluation of anti -SARS-CoV-2 neutralizing antibody levels in 3-dose vaccinated haemodialysis patients shows a good 3rd dose antibody response** Karunathilake KRP[1], Kumara A[1], Karunathika A[1], Wazil AWM[2], Nanayakkara N[2],Bandara K[2], Abeysekera R[3], Noordeen F[1], Gawarammana IB[3], Ratnatunga CN[1] [1]Department of Microbiology, Faculty of Medicine, University of Peradeniya, Sri Lanka, [2]Nephrology Unit, National Hospital Kandy, Sri Lanka, [3]Department of Medicine, Faculty of Medicine, University of Peradeniya, Sri Lanka
OP 10	**Emerging variants of SARS-CoV-2 in Sri Lanka** Anthonies RKDJR[1], Arachchige NDS[2], Dharmasiri AWR[2], Hemamali WPEH[1], Hildebrandt-Einfeldt L[1], Perera T[1,3,] Sepalage CS[1], Siriwardana S[1], Perera IC[1],Janage SN[2] [1]IDEA Laboratory, Department of Zoology and Environment Sciences, Faculty ofScience, University of Colombo, Sri Lanka, [2]Department of Molecular Biology, Medical Research Institute, Colombo, Sri Lanka, [3]Institute of Biochemistry, Molecular Biology and Biotechnology, University of Colombo, Sri Lanka
9.30am – 10.00am	**Tea**
10.00am –11.15am	**Plenary 4** Chairperson – Dr. Primali Jayasekera **Emerging fungal infections** **Professor Adilia Warris** Paediatric Infectious Diseases Specialist, Co -Director MRC Centre for Medical Mycology, Consultant Great Ormond Street Hospital London, MRC Centre for Medical Mycology, University of Exeter, United Kingdom

11.15am –12.15pm	**Symposium 3** **Paediatric central nervous system infections** Moderators – Dr. Samanmalee Gunasekara and Dr. Kishani Dinapala **Central nervous system infections in children – clinical insight** **Professor Philip Britton** Staff Specialist Infectious Diseases Physician and Associate Professor, The Children's Hospital at Westmead, and University of Sydney, Australia. **Toxoplasmosis in children** **Professor Alison M Kesson** Head Infectious Diseases and Microbiology, The Children's Hospital at Westmead, Conjoint Professor, Discipline of Child and Adolescent Health,Sydney Institute for Infectious Diseases, University of Sydney, Australia **Diagnostic support for CNS infections in children** **Dr. Dhammika Vidanagama** Consultant Clinical Microbiologist, Lady Ridgeway Hospital for Children, Colombo, Sri Lanka
12.15pm –1.15pm	**Plenary 5** Chairperson – Dr. Rohitha Muthugala **Post-COVID syndromes and their management** **Dr. Harsha Sathischandra** Specialist in Internal Medicine, National Hospital of Sri Lanka, Colombo, Sri Lanka
1.15pm – .2.15pm	**Lunch**
2.15pm – 3. 45pm	**Interactive session on case scenarios** Moderators – Dr. Nadisha Bandanasinghe and Dr. Pavithri Bandara
3.45pm – 4.15pm	**Award ceremony and close of conference**
4.15pm	**Tea**

Post-Congress Workshop on Managerial Leadership Excellence – an Interactive Training - (SLCM Members only)

Date: 27th August 2022 Time: 9.00am - 4.00pm
Venue: "Lionel Memorial Auditorium", Sri Lanka Medical Association, Colombo 07
Chairpersons – Dr. Geethika Patabendige, Dr. Deepa Perera and Dr. Nilushi De Silva

Resource Person: Professor Ajantha Dharmasiri
Professor in Management
Former Director of Postgraduate Institute of Management

LIST OF SPEAKERS

Pre-Congress Workshop 24.08.2022

Dr. Roshan Jayasuriya
Consultant Microbiologist, Additional Approved Analyst
National Institute of Health Sciences
Kalutara, Sri Lanka

Professor Narada Warnasuriya
Emeritus Professor of Paediatrics
University of Sri Jayawardenepura and
Senior Professor of Paediatrics
General Sir John Kotelawela Defence University, Ratmalana, Sri Lanka

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

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

Dr. Sjors Schulpen
Netherlands Biosecurity Office of the
National Institute for Public Health and the Environment
Netherland

Dr. Jumeko Sule
Consultant Microbiologist, Clinical Microbiology and Public Health Laboratory
Cambridge University Hospital, NHS
Foundation Trust, United Kingdom

Scientific Sessions Day 1 – 25.08.2022

Dr. Yuen Su

Infectious Diseases Physician
Prince of Wales Hospital
Sydney, Australia

Dr. K. Umapathy

Consultant Orthopaedic Surgeon
National Hospital of Sri Lanka
Colombo, Sri Lanka

Dr. Rajiva De Silva

Consultant Immunologist
Medical Research Institute
Colombo, Sri Lanka

Dr. Saranga Sumathipala

Consultant Medical Virologist
Teaching Hospital,
Anuradhapura, Sri Lanka

Dr. Gabriela M. Marón Alfaro

Pediatric Infectious Disease Specialist in Memphis TN | Healthgrades
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Scientific Sessions Day 2 – 26.08.2022

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Post-Congress Workshop - 27.08.2022

Professor Ajantha Dharmasiri

Professor in Management,
Former Director of Postgraduate Institute of Management

Pre-Congress Presentations

The use of information technology (IT) to improve the quality of delivering microbiological services

Dr. Roshan Jayasuriya

Information technology (IT) is the use of computers, storage, networking and other physical devices, infrastructure and processes to create, process, store, secure and exchange all forms of electronic data.

Integration of IT in the Microbiology laboratory, through the application of laboratory information management systems (LIMS), has enhanced a range of services, including the ordering of laboratory tests, advanced instrument workstation services, reporting of laboratory data, dynamic test scheduling, and advanced facilities management. IT services also provided a venue for laboratory staff to learn and interact with peers, easily communicate between different departments, and educate patients.

These systems ensure that patient records and data are properly stored so as to enable features such as a patient clinical history tracking as well as statistical reports generation.

But as clinical microbiologists, there are significant barriers which currently limit our ability to use IT to function at the highest level possible. We will discuss the best use of IT in improving quality of delivering microbiological services, barriers faced and approaches to overcome obstacles.

Professionalism and communication

Professor Narada Warnasuriya

The medical profession is recognized as a learned (knowledge based) profession since the concept came into being in 12th century. It has also been recognized as a noble profession from even before that, as it has been guided by a code of ethics from time of Hippocrates.

However, in recent times, due to many factors the public perception of the medical profession has deteriorated both locally and globally. The willingness and ability of the medical professionals to communicate with the patient and the public has been specially recognized to be deficient.

This presentation will discuss the theoretical underpinnings of medical professionalism and critically analyze the factors for its perceived decline. It will also suggest remedial action at both personal and professional practice. The speaker, a medical teacher and a specialist clinician of 47 years experience will base the presentation on a broad reading of the relevant literature and a deep reflection of his own personal and professional experience.

How to plan research in achieving best clinical effectiveness?

Professor Enoka Corea

Clinical effectiveness is about doing the right thing at the right time for the right patient. Clinical effectiveness is concerned with improvements in quality and performance and patient outcomes. Clinical research begins with a research question or an idea that arises from an issue in your clinical practice. You will not be motivated to plan and complete the research unless the research topic is rooted in a clinical problem relevant to you and the results effect a change or improvement in your medical practice.

The next step is to become more informed about the area of interest through a systematic literature review. A comprehensive literature review informs the researcher of the existing clinical evidence on a research topic.

In addition, reviewing the literature will inform the choice of recruitment methods, outcome measures, questionnaires, intervention details and statistical strategies – useful information to increase the study's relevance, value, and power. This is the time to enhance the relevance, feasibility and efficiency of your research topic and define it into an answerable research question. This is also the time to run your research idea past clinical experts, experienced researchers and relevant stakeholders of the research topic. Once the research question is well defined you need to design a study to answer the question. Make sure to set up effective collaborations with the right experts and clinicians. A well-developed research question will have an initial hypothesis of the possible relationship between the explanatory variable/exposure andthe outcome. This will inform the nature of the study design, be it qualitative or quantitative, primary or secondary, and non-causal or causal. However, you will need help from experts in study design, data collection design and statistical analysis. Planning your study design, data collection design and statistical analysis is the most important part of your research and it is worth spending time to keep rewriting and improving each of these three components by submitting them for peer review by colleagues, research committees and ethics committees. Make sure you have adequate free time and personnel to implement your study. Collect the data meticulously and record it carefully and enter it into the prepared database as soon as possible, correcting for any missing data.

Finally, present your results in a timely manner. Concise, explicit, and complete reporting are the guiding principles in reporting clinical studies. Researchers need to acquire appropriate writing and reporting skills from the beginning of their careers, and these skills should improve with persistent use and regular reviewing of published journal articles.

Take care to avoid pitfalls in research that will result in unnecessary, invalid and misleading studies including ignorance of previous similar studies, poor study design and implementation, low validity of measurements, no predetermined statistical analysis, insufficient reporting, bias and conflicts of interest.

Key determinants of an effective antibacterial agent

Professor Shalini Sri Ranganathan

Antibacterial resistance is rising exponentially, threatening our ability to treat even common infectious diseases. Many infections are becoming harder to treat as antibacterial agents are turning out to be less effective. Searching for effective antibacterial agents is a top priority and challenge.

Effectiveness is not the same as efficacy. Efficacy is the extent to which a medicine has the ability to bring about its intended effect under ideal circumstances, such as in a randomized clinical trial whereas effectiveness is the extent to which a medicine achieves its intended effect in the usual clinical setting.

The challenge to the Science is to develop efficacious antibacterial agents whilst the challenge to the Healthcare is to retain the effectiveness of antibacterial agents. Antibacterial resistance is a threat to both efficacy and effectiveness as antibacterial agents will not be able to bring about their intended effect in both ideal and clinical settings.

There are many impediments to effectiveness of antibacterial agents in addition to antibacterial resistance. An efficacious antibacterial agent will become ineffective in healthcare settings if these impediments are not addressed. This highlights the need to understand the determinants of effectiveness of antibacterial agents.

Key determinants of an effective antibacterial agent include, but not limited to, efficacy, antibacterial resistance, pharmacokinetics, safety, drug interactions, quality, adherence, and administration practice. They can be evaluated only through observational studies of real practice. Addressing these determinants has the potential to ensure effectiveness of antibacterial agents.

Biosecurity and bioterrorism

Dr. Sjors Schulpen

Have you ever considered whether the results of your well-intentioned research could also be misused? Biosecurity is an important aspect to protect your research against misuse or even bioterrorism purposes.

During this presentation, the aspects of biosecurity and the difference with biosafety, together with the definition of dual-use research of concern, will be explained. Furthermore, examples of bioterrorism and biological weapons programs will also be discussed.

Plenary Presentation 1

Overview on common immunodeficiency case scenarios (PID) in Sri Lanka

Dr. Rajiva De Silva

Primary immune deficiency now called inborn errors of immunity (IEI) are due to monogenic defects in the immune system, leading to functional defects of immunity. These result in infections, autoimmunity, atopy, autoinflammation and lymphoproliferation. The International Union of Immunological Societies (IUIS) has identified 430 single gene inborn errors of immunity in its latest classification, divided into 10 categories. These include (I) immunodeficiencies affecting cellular and humoral immunity, (III)predominantly antibody deficiencies, (V) congenital defects of phagocyte number or function, (VI) defects in intrinsic and innate immunity.

This presentation discusses 4 specific IEI, important due to the severity of the condition or the prevalence of the disease. These include severe combined immune deficiency (category I), common variable immune deficiency (category III), chronic granulomatous disease (category V) and Mendelian susceptibility to mycobacterial disease (category VI). Many of these diseases are seen by specialists in infectious diseases (including microbiologists), and early detection and management reduce mortality and morbidity.

Plenary Presentation 2

Introduction of multi-disciplinary antimicrobial stewardship (AMS) ward rounds at a tertiary hospital

Dr. Sumita K. Pai

Introduction: Our hospital is a tertiary cardiothoracic hospital specialising in cardiothoracic, heart and/or lung transplant surgery, cardiology, and respiratory medicine. Introduction of our system-wide electronic prescribing system (Y®) in 2018, allowed feedback to clinical divisions on their antimicrobial prescribing behaviour[1]. These reports identified that the surgery division would benefit from AMS support, as 20% of patients received antimicrobials for nosocomial infections post their cardiac / thoracic surgery. In 2020/21, there were 44 incidents / near misses within the surgery division involving antimicrobial medicines. To tackle this, we assessed what impact, a dedicated AMS multi-disciplinary team ward rounds would make, to the care of our surgical patients. The initial aims of this project were to:

1. Improve patient safety by optimising the use of appropriate antimicrobials through the introduction of, twice weekly multidisciplinary AMS ward rounds demonstrated through reduction in Defined Daily Doses / 1000 bed admissions and Datix® AMS incidents.
2. Empower medical staff and non-medical prescribers on appropriate antimicrobial prescribing decision-making through bite-sized "on-the-job" training sessions.
3. Demonstrate a financial saving.
4. Build a business case for a permanent full-time Band 7 antimicrobial pharmacist within the AMS Team.

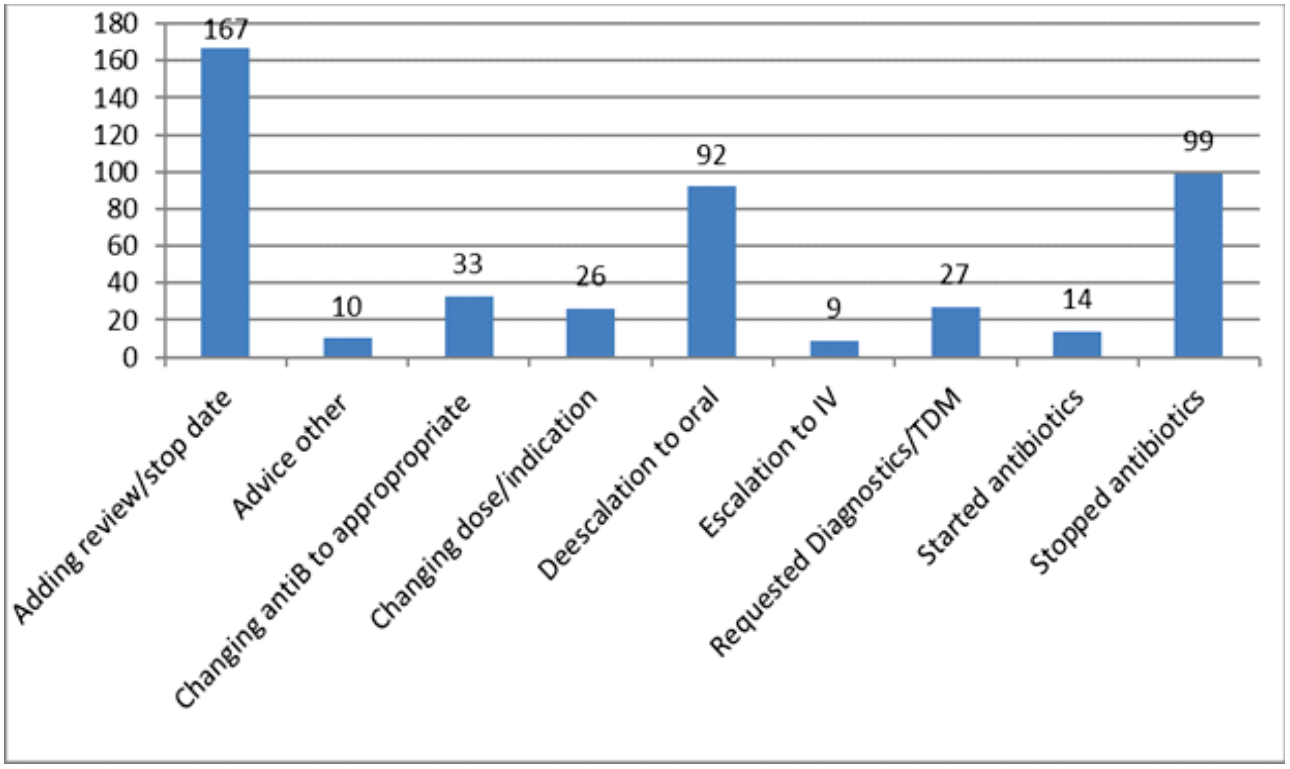
Method: Following engagement with our Chief Pharmacist and our Service and Cost Improvement Programme (SIP/CIP) Manager we scoped out the project using established trust project management tools. A 4-week pilot project in September 2021 helped further identify other unforeseen challenges. We presented this data to the Medical Director and to the Director of Infection Preventions and Control (DIPC).

Subsequently, they released a surgeon and a senior advanced nurse practitioner from each surgical ward area, to attend twice weekly structured multidisciplinary ward rounds. Each participant had a defined role to play within the AMS ward round. The AMS pharmacist collated the interventions and alongside the Consultant Microbiologist followed up all recommendations. Data was gathered between 1/12/20 and 20/8/21. This study did not require ethics approval.

Results: The AMS team reviewed 509 antimicrobial prescriptions in 440 patients between 1/12/20 and 20/8/21. Of these, 477 (93.7%) prescriptions required an AMS intervention. The graph below (Graph 1)
A 10% reduction in antimicrobial use was observed across the Trust during 1/12/20-20/8/21. A financial saving of £32,034 was made between 1/12/20 and 20/8/21 compared to 1/12/19 and 20/8/20.

This project was successful at demonstrating strong evidence for a "spend to save opportunity" to our financial board resulting in the successful investment into the AMS team of a permanent 0.8 WTE Band 7 Agenda for Change AMS pharmacist.displays the details of the interventions made. Medication errors were identified and corrected, which avoided potential patient harm and reduced costs on some unnecessary prescriptions. Number of Datix® antibiotic related incidents reduced from 44 to 20 in 2021/22.

Graph 1: AMS interventions made



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Discussion / Conclusion

Twice weekly multidisciplinary AMS Ward Rounds have become fully established on all surgical wards at our tertiary hospital. This has increased the profile of the AMS Team and has improved patient safety, working relationships and achieved financial savings. The English surveillance programme for antimicrobial utilisation and resistance (ESPAUR) (2020-21)[2] reported that our tertiary hospital demonstrated an 8.26% reduction in antibiotic use across the financial year. These ward rounds formed an educational forum to teach surgical teams in best antibiotic prescribing practice and enabled the establishment of a regular weekly teaching program.

References:

1. Dryden M, Johnson AP, Ashiru-Oredope D, Sharland M. Using antibiotics responsibly: right drug, right time, right dose, right duration. J Antimicrob Chemother. 2011 Nov;66(11):2441-3. doi: 10.1093/jac/dkr370. Epub 2011 Sep 15. PMID: 21926080.

2. UK Health Security Agency. English surveillance programme for antimicrobial utilisation and resistance (ESPAUR) Report 2020 to 2021.Crown Copyright; 2021. Published: November 2021 [cited 2022 May 27]. Available from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachemnt_data/file/1069632/espaur-report-2020-to-2021-16-Nov-FINAL-v2.pdf

Plenary Presentation 3

Diagnosis and mitigation of hospital acquired infection with a special focus on molecular diagnostics

Dr. Shankar Sengupta

Clinical microbiology is a relatively new science. Once incurable and lethal infections have become readily diagnosed and easily treatable, contributing to today's lofty expectations of modern medicine in which unsuccessful treatment of infections is considered a major failure.

The emergence of antimicrobial resistance, including readily transmissible genetic elements in major human bacterial pathogens that confer resistance to most or all available antimicrobials, has foreshadowed the possible return of serious untreatable infection. Much of this is attributable to suboptimal-usually excessive use of antimicrobials in and out of hospital settings, which is estimated to occur in 30 to 50% of all prescriptions. Suboptimal antimicrobial usage often stems from inappropriate interpretation or use of microbiological test results: lack of a microbiologically confirmed diagnosis, laboratory test errors, failure to submit appropriate specimens for culture, misuse of microbiology resources, and a general overreliance on empirical antimicrobial therapy with attendant disregard of microbiological results.

In less than a decade, innovations in infectious diseases diagnostics have led to startlingly swift strides in test attributes long valued by laboratorians and clinicians: broad diagnostic scope, high accuracy and sensitivity, rapid turnaround time, and minimal labour requirements. Disruptive technologies such as mass spectrometry and automated, highly multiplexed, all in-one molecular platforms have transformed laboratory operations, and in some cases, the quality of clinical services provided to patients. Emergence of these new technologies has also led to deliberations about how to harness them to ensure maximal impact at the patient level.

Accurate diagnostics are critical for safe patient care and have additional impacts in our environment of value-based payment, public reporting, and quality metrics, where hospitals may incur penalties for HAI test overuse, including lost reimbursement, financial penalties, and damage to institutional reputation and rankings. From a patient care perspective, over-diagnosis of HAIs could lead to inappropriate antimicrobial use and attendant unnecessary cost and risks antimicrobial resistance and adverse drug effects.

While reducing unnecessary tests for HAIs can have many potential benefits for the patient and hospital, test under- utilization raises the possibility for serious infections going undiagnosed and untreated. A major objective for diagnostic stewardship for HAIs is to identify the “sweet spot” of test utilization that minimizes over- diagnosis and false positive results while maximizing appropriately indicated testing and true positive results.

Plenary Presentation 4

Emerging fungal infections

Professor Adilia Warris

Over the last decade, we have been confronted with newly discovered fungal species, new fungal disease phenotypes, and an emerging antifungal resistance development. Together, this has challenged the diagnosis and treatment of fungal infections, and underlined the restricted tools available for the management of these infections. I will focus in my talk on (1) the increase of multi-resistant *Candida auris* candidemia in intensive care settings, (2) disease caused by azole-resistant *Aspergillus fumigatus* and its associated increase in mortality, (3) COVID-19 associated pulmonary aspergillosis, (4) resistant dermatophytosis, and (4) emerging sporotrichosis caused by *Sporothrix brasiliensis*, a fungal zoonosis.

Plenary Presentation 5

Post-COVID syndromes and their management

Dr. Harsha Sathischandra

COVID-19 caused by SARS-CoV-2 is primarily an acute respiratory illness first described in early 2020. It could involve multiple organ systems in the acute phase with significant morbidity and mortality. SARS- CoV-2 could also cause delayed or long-term complications which are being increasingly recognized. These could be categorized as post-COVID syndromes though some authors prefer to describe those under the heading 'the post-COVID condition'.

Although definitions of post-COVID syndromes vary, WHO coins the term when symptoms occur 3 months from the onset of COVID-19 with symptoms lasting for at least 2 months. Symptoms may be of new onset or could persist from the initial illness. Common symptoms are fatigue, shortness of breath and cognitive dysfunction. The symptoms could have a severe impact on the day-to-day functioning of the affected individual.

The syndromes could involve effects on multiple organ systems. The respiratory, cardiovascular and central nervous systems are most commonly involved. Although some syndromes are clearly defined, some others are less well described currently.

Management of the affected patients involves relief of both physical and mental distress. Specific treatment options are available only in a few instances, whereas good supportive treatment is key in most syndromes. Several large studies are currently ongoing and it is likely that our understanding of this most unusual entity will see much change once results are known. Accordingly, management could also see refinement. But as of now the best way to prevent the occurrence of the post-COVID condition is by being up to date with vaccination.

Symposia 1

Skeletal prosthesis and infection- The story of the foot print

Dr. K. Umapathy

The man has walked through the planet and has left the foot print at several stages. These foot prints leave a mark of interference. The use of surgical implants and implanted devices has increased as a result of their beneficial effect on quality of life, and in some circumstances, on patient survival rates. But they do leave a mark interference and can, however, be associated with a variety of complications, the most dreaded being infection.

These biological foot prints have a great impact on tissue biology. Hence prosthesis related infections are important to understand because of the morbidity and mortality associated with them. Frequently, patients are managed with hospitalization, prolonged courses of antibiotics, and surgical interventions, all of which can negatively impact on patients' quality of life. Such care is also associated with increased costs to health care systems. Furthermore, these infections often represent a diagnostic challenge because of the lack of consensus definition of what constitutes an infection.

A through appreciation and respect for the innumerable factors that may contribute to prosthesis related infection is essential in the development of an over-all approach to prevention. Optimal diagnostic microbiologic specimens are paramount in tailoring the antimicrobial therapy, which almost always has to be given for a prolonged period of time.

Prevention is complex, yet extremely valuable mode and it is worthy for every cent. Attentive application of the principles of infection control, with the goals of optimization of the wound environment, augmentation of host response and minimization of bacterial contamination are the essentials in the management in order to heal these biological foot print.

Symposia 2

Pre-transplant screening, prophylaxis and pre-emptive therapy in HSCT related infections

Dr. Saranga Sumathipala

Chemo and radiation therapies associated with haematopoietic stem cell therapy (HSCT) cause impairment of bodily defences against infection including epithelial barrier impairment and suppression of specialized immune cells. This renders patients undergoing HSCT vulnerable for a range of severe infections which may be acquired from donor, environment, microflora from recipient itself or by reactivation of dormant infections in the recipient.

Therefore, preventive approaches are of utmost importance to ensure the survival of the HSCT recipient. This includes pre-transplant screening of both the donor and the recipient for specific infections and tailoring prophylactic / pre-emptive therapies based on infection profiles and the immunosuppression profiles.

Challenges in setting up and sustaining a HSCT unit, local perspective

Dr. Samanmalee Gunasekara

Hematopoietic Stem Cell Transplant (HSCT) is often the only curative option in many hematological malignant and non-malignant conditions. Establishing and maintaining a HSCT unit in resource limitedsetting remains a challenge. The direct and indirect cost of care are huge. For a HSCT facility to come up apart from huge cost, health care worker training, location, equipment, blood bank and laboratory advancement are needed.

Engaging local professionals and other stake holders with the proper commitment is the first and foremost step. Local health authorities including administrators should

be involved from the start to increase the long-term sustainability of the project.

Repair and maintenance of complex air conditioning system with positive air pressure and required number of air exchanges is not easy and very expensive. Also, these patients are heavily treated in hospitals prior to transplant and colonized with antibiotic resistant organisms. Therefore, standard precautions and transmission-based precautions should be practiced to prevent cross infections. Active surveillance and infections control audits need to be carried out regularly to monitor the practices.

Symposium 3

Toxoplasmosis in children

Professor Alison M Kesson

Toxoplasma gondii is an obligate intracellular parasite. Infection is common with an estimated 30% or more of the global population infected. Symptomatic infections are rare in the immunocompetent host with a large proportion of the infected population having latent infection. Clinical manifestations can range from subtle, self-limiting to severe life-threatening disease with more severe disease seen in the immunocompromised patients. Diagnosis can be difficult and several agents are available for therapy.

Diagnostic support for CNS infections in children

Dr. Dhammika Vidanagama

Aetiological diagnosis is vital for the successful treatment of central nervous system (CNS) infections in children. Clinical features and neuroimaging guide the syndromic approach of management. Early empiric therapy may include a combination of antimicrobial agents considering the possibility of different pathogens. A broad-spectrum antibiotic cover is used to minimize mortality, morbidity and complications leading to lifelong disability. An ideal diagnostic service should enable effective use of antimicrobials and improve patient outcomes while preventing antimicrobial resistance.

Cerebrospinal fluid (CSF) is the most important specimen used to detect CNS pathogens. Routine chemistry and cellular analyses of CSF may assist in differentiating bacterial versus viral infections.Obtaining an adequate volume of CSF before starting antimicrobials is not possible on some occasions. Conventional laboratory methods include direct microscopy, antigen tests and cultures of CSF. Diagnostic yield of traditional methods is poor with low numbers of organisms present in CSF. Recovery of bacterial, fungal, and viral pathogens from CSF may take several days, and the results may be negative if antimicrobials are administered empirically or if the infection is caused by fastidious or nonculturable microorganisms. Blood cultures are useful in the diagnosis of bacterial meningitis.

Availability of molecular techniques in hospital laboratories is a breakthrough in the detection of CNS pathogens. Rapid, real-time nucleic acid amplification platforms have significantly improved the sensitivity and turnaround time of microbiological diagnostics. Syndromic testing by multiplex molecular panels have become valuable tools in the laboratory. Metagenomics offer 'hypothesis free' testing which need careful evaluation when introducing into diagnostic algorithms.

Wide range of causative organisms and the suboptimal predictive values of available laboratory techniques remain as challenges in the diagnosis of CNS infections. Several studies have reported both false-positive and false-negative results with the currently available multiplex PCR panels. High cost hinders the widespread use of molecular diagnostics especially in resource-limited countries. Testing strategies appropriate for different clinical and epidemiological settings should be developed to optimize the benefits of newer diagnostic methods.

ORAL PRESENTATIONS

OP 1

Inward and outpatient department antibiotic consumption in a District General Hospital

Wijeweera KDDS, Priyanthi AAD

District General Hospital Matara, Sri Lanka

Introduction

Antibiotic resistance has been identified as one of the major health threats. Increased antibiotic usage is linked with the development of antibiotic resistance. A point prevalence survey (PPS) is a useful tool to evaluate antibiotic consumption at a given time.

Objective

The objective of the study was to describe antibiotic usage in inward patients and the antibiotic consumption pattern in the **outpatient department (**OPD).

Design, setting and methods

The PPS was carried out on a single day in District General Hospital Matara by utilizing the BHTs of inward patients who were on antibiotics. The midnight total of the previous day was considered as the number of patients in each ward and only those were considered for the study. The antibiotic consumption at the OPD was evaluated by referring all the prescriptions collected at the outdoor pharmacy on the same day.

Results

A total of 492 inward patients and 258 OPD prescriptions were evaluated for the study. Out of the inward patients, 56.7% (n=279/492) were on antibiotics. The usage of antibiotics was highest in surgical wards (65.8%). The majority of patients who were on antibiotics were on monotherapy 62% (173 / 279) while 2.2% (7 / 279) were on more than three antibiotics. The majority of the medical patients (68%) were on antibiotic monotherapy, while it was dual therapy in surgical wards (54.7%). Most of the patients who were on more than three antibiotics were from surgical wards (43%, n=3). The majority of the antibiotics had been given for less than 5days at the time of the survey. Of surveyed OPD prescriptions, 52% (134 / 258) contained antibiotics. The majority (86.6%, 116/134) of OPD patients were on monotherapy. Co-amoxiclav (22.3%, 30/134) was the most frequently prescribed agent followed by metronidazole (15.7%,21 / 134) azithromycin (15.7%, 21/134), and amoxicillin (15.7%, 21/134).

Conclusion

High antibiotic consumption was observed in the surgical wards including the usage of multiple antibiotics. Unrestricted prescribing of reserve antibiotics such as azithromycin at the OPD level is a concern. Ongoing surveillance of antibiotic consumption should be implemented to ensure rational antibiotic use in the given hospital.

OP 2

Incidence of respiratory pathogens other than SARS-CoV-2 detected in symptomatic patients during COVID-19 pandemic

Janage SN, Palipane EG, Dharmasiri AWR, Arachchige NDS, Weerathunga APAI, Senanayake MS, Kaushalya AGG

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Introduction

Similar clinical manifestations are detected among COVID-19 and other respiratory tract infections. The focus for the detection of respiratory pathogens other than SARS-CoV-2 has decreased with the COVID-19 pandemic. It is important to understand the epidemiological trend of other respiratory tract infections toidentify their impact on the healthcare system. This study investigated symptomatic patients for other respiratory pathogens when they were negative for SARS-CoV-2.

Objective

To demonstrate the incidence of respiratory pathogens other than SARS-CoV-2 in symptomatic patients.

Design, setting and methods

This was a cross-sectional descriptive study. SARS-CoV-2 PCR negative nasopharyngeal swabs from patients with respiratory symptoms received at the Department of Molecular Biology, Medical Research Institute (MRI), Colombo during the period of October 2021 to January 2022 were selected. Samples were from hospitals and MOH areas of the Western and North Western provinces. They were tested with the RespiFinder 2SMART multiplex real-time PCR assay that detects adenovirus, bocavirus, coronavirus NL63/HKU1, OC43, 229E, hMPV, influenza A & B, A H1N1pdm09, parainfluenza 1,2,3 & 4, rhinovirus/enterovirus, RSV, *Mycoplasma pneumonie, Chlamydophila pneumoniae, Legionella pneumophila* and *Bordetella pertussis*.

Results

There were 41 patients with a mean age of 38 years. Three were children below the age of 12 years. Influenza A was the commonest pathogen detected with an incidence of 14.6% (06). Influenza B was detected in 2.4% (01). Mean age of influenza positive patients was 47 years. All influenza patients had cough and fever with 57.1% also having shortness of breath. Rhinovirus / Enterovirus was detected in 9.8% (04) of patients with a mean age of 23 years. None of them had shortness of breath. RSV was detected in 4.9% (02). Both were children aged 4 and 7 years who presented with cough and shortness of breath. None of the tested pathogens were detected in 68.3% (28).

Conclusion

Despite the COVID-19 pandemic, co-circulating respiratory pathogens other than SARS-CoV-2 were detected to cause sporadic cases of respiratory tract infections. Surveillance of other common respiratory pathogens will help to detect changing trends in respiratory tract infections in parallel to the COVID-19 pandemic.

OP 3

Chigger mites (Acari: Trombiculidae and Walchiidae) associated with rodents in selected scrub typhus-prone areas in Southern and Western provinces of Sri Lanka

Ashani MLS[1], Chandrasena TGAN[2], Gunathilaka PADHN[2], Silva RB[3,4], Jacinavicius FC[3], Premaratna BAHR[1]

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Introduction

Chigger mites are vectors and reservoirs of Scrub Typhus (ST) and carried by small mammal hosts. Vector surveillance is crucial in disease control as it enables the identification of potential vectors and facilitate planning of control interventions.

Objectives

The study aimed to gather information on chigger mites and their rodent hosts as those are scarce in Sri Lanka.

Design, setting and methods

Field sampling was carried out in the districts of Galle, Hambantota and Gampaha, in 2019 and 2020. Sampling sites were selected according to the patient distribution. Rodents were captured using baited traps (3"x3"x10"), set up just before sunset at peri-domestic or work premises of ST fever patients. The trapped rodents were anesthetized with ketamine (75mg / kg) / xylazine (10 mg / kg) and examined for larval mites. Mites detected were removed carefully with a brush, collected, and washed individually with 10% PBS and slide-mounted in Hoyer's medium. Chiggers were speciated morphologically by visual inspection and morphometry using a camera-mounted light microscope (x100 magnification).

Results

Of 460 traps placed, 60 hosts belonging to species *Rattus rattus*, *Rattus norvegicus*, *Tatera indica*, *Gollunda ellioti* and *Suncus murinus* were captured. In these 60 small mammals, 394 chiggers were collected and identified. *Leptotrombidium imphalum* (72.59%; n=286) was the predominant species followed by *Schoengastiella punctata* (8.12%; n=32), *Leptotrombidium* sp. (3.55%; n=14) and *Microtrombicula* sp. (4.82%; n= 19) respectively. Some (7.11%; n=28) were not trombiculid mites while 3.81%; n=15 were damaged beyond identification. *Leptotrombidium imphalum* was detected for the first time parasitizing the murids *Rattus norvegicus* and *Tatera indica* in the district of Galle, a new locality. In addition, *Schoengastiella punctata* was also recorded in a new locality (Gampaha District) with a new host association (*Golunda ellioti*).

Conclusions

Leptotrombidium imphalum and *Schoengastiella punctate,* recorded in the study are known vectors of ST. Hence, the study identifies the need to conduct further entomological surveys on chiggers in ST endemic areas to facilitate better identification of chiggers in Sri Lanka. Identification and documentation of disease vectors will strengthen vector surveillance disease control measures.

OP 4

Molecular detection of selected genetic determinants of carbapenem resistance among invasive isolates of Acinetobacter baumannii recovered from selected tertiary care units in Colombo District, Sri Lanka

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Department of Medical Microbiology and Immunology, Faculty of Medicine, University of Colombo, Colombo, Sri Lanka.

Introduction

Carbapenem resistant *Acinetobacter baumannii* (CRAB) is a major healthcare concern. A predominant mechanism of resistance is OXA carbapenemase mediated drug hydrolysis, encoded by blaOXA genes. Of these, blaOXA-51-like is intrinsic to *Acinetobacter baumannii* (AB) and is used to confirm its speciation, while blaOXA-23-like, which encodes for its globally predominant OXA-23 carbapenemase, is acquired. Carbapenemase gene expression is enhanced by insertion sequences like ISAba1, which also mobilizes genes. Detection of these genetic determinants has not been attempted in Sri Lanka. Such information will contribute to the surveillance of antimicrobial resistance in our setting.

Objectives

To confirm the species of presumptive AB

To describe antibiotic resistance profiles of isolates

To utilize a phenotypic test to detect carbapenemase production among CRAB

To detect blaOXA-23-like and upstream presence of ISAba1 in relation to blaOXA-51-like among CRAB

Design, setting and methods

Fifty-four blood culture isolates, presumptively identified as AB by BD PhoenixTM, were assessed for presence of blaOXA-51-like using conventional PCR to confirm speciation. Confirmed AB isolates identified as CRAB by BD PhoenixTM antibiotic sensitivity profiling were tested for carbapenemase production using the CarbAcineto NP (CANP) test, along with PCR to detect blaOXA-23-like and presence of ISAba1 upstream to blaOXA-51-like.

Results

Fifty of the 54 presumptive AB isolates were confirmed to be AB by blaOXA-51-like PCR. Forty-six were CRAB by meropenem MIC profiles, of which 32 were positive for blaOXA-23-like. ISAba1 was not found upstream to blaOXA-51-like in any CRAB isolate, making blaOXA-51-like unlikely to be plasmid related. Of the 32 CRAB isolates positive for blaOXA-23-like only 20 were detected by CANP. However, CANP detected 12 additional carbapenemase producers.

Conclusions

Confirmatory speciation of presumptive AB can be performed using blaOXA-51-like conventional PCR. Presence of blaOXA-23-like is an important determinant of carbapenem resistance in our setting while ISAba1 mediated blaOXA-51-like hyper-expression may not be important. CANP lacks sensitivity when compared to molecular methods to detect blaOXA-23-like mediated carbapenemase production but may detect additional carbapenemases not represented in the PCR panel.

OP 5

Diabetic foot infections due to biofilm forming and other aerobic microbiota in patients presented at the National Hospital of Sri Lanka: A microbiological study

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Introduction

Diabetic Foot Infections (DFIs) has increased partly due to rising incidence of multidrug resistant organisms. Some of them produce biofilms which further aggravate the problem by tolerant to antimicrobials compared with planktonic bacteria. Aggressive source management and usage of appropriate antibiotics could be done by detection of biofilm which ultimately reduce mortality and morbidity.

Objectives

To study the aerobic microbiota, their ability of biofilm formation, its antimicrobial susceptibility in patients with DFIs in surgical casualty ward at the National Hospital of Sri Lanka and to determine the association between biofilm formation and antimicrobial susceptibility pattern among those isolates using conventional method.

Design, setting and methods

A hospital based descriptive-cross sectional study was carried out from 168 biopsy or curettage specimens of DFIs in surgical casualty ward at National Hospital, Sri Lanka. Isolation of microorganisms were performed on blood agar, chocolate agar and MacConkey agar. Routine biochemical tests, manual identification/automated Phoenix identification system were used for species identification. Antibiotic susceptibility of organisms was determined by CLSI (2020) disc diffusion method. Biofilm formation was detected from both tube method and Congo red agar method.

Results

Prevalence of mono microbial isolates (139/197, 70.5%) was more than polymicrobial isolates (58/197, 29.5%) and the majority were Gram-negatives (165 / 197, 83.7%). *Pseudomonas* species was the commonest isolate (60 / 197, 30.4%) followed by *Escherichia coli* (42/197, 21.3%). Seventy three percent (11/15) of *Staphylococcus aureus* (*S.aureus)* were methicillin resistant *S.aureus.* None of the Gram-positive isolates was resistant to glycopeptide. Gram-negative isolates have resistance to ampicillin (90/95,94.7%) and amoxicillin-clavulanate (81/95, 85.27%). Biofilm was detected in 58.8% (116/197) ofisolates. Highest biofilm formation was seen in *Escherichia coli* (30/42, 71%) followed by *Pseudomonas* species (42/60, 70%). Significant association of antibiotic resistance was exhibited by biofilm-producing isolates compared with non-biofilm producers in both Gram-positive and negative isolates.

Conclusion

Antibiotic resistance was high in biofilm-producing isolates compared to non-biofilm producing isolates in both Gram-positive and negative microorganisms. Significant association was seen in biofilm formation with antibiotic resistant isolates including methicillin resistant *S.aureus* and extended-spectrum beta-lactamases producing microorganisms in DFIs.

OP 6

Prevalence of *Staphylococcus aureus* and detection of staphylococcal enterotoxin A among positive culture isolates of *Staphylococcus aureus* in raw pork from retail markets in the Gampaha District, Sri Lanka

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Introduction

Staphylococcal food poisoning (SFP) is one of the most common food-borne diseases (FBD) worldwide. It is caused by the ingestion of foods contaminated with preformed staphylococcal enterotoxin (SE) produced by the bacterium *Staphylococcus aureus* (*S. aureus*). Meat and meat products are frequently implicated as a vehicle for the incidents of SFP.

Objectives

To detect the prevalence of S. aureus in raw pork from selected retail markets in the Gampaha District and to determine production of staphylococcal enterotoxin A (SEA) in positive culture isolates of *S. aureus* strains.

Design, setting and methods

A descriptive cross-sectional study was conducted over four months from November 2019 to March 2020. Raw pork samples were collected from randomly selected retail market places in the Gampaha District including both retail wet markets and pork-selling supermarkets. Samples were processed according to the standard operating procedure (SOP) for detection and enumeration of *S. aureus* from food and animal feed. Determination of SEA was performed on positive culture isolates of S. aureus strains in pork samples by ELISA (Enzyme-Linked Immuno-Sorbent Assay) method as per the manufacturer's instructions. Association between the level of *S. aureus* contamination and the detection and the level of SEA produced by the *S. aureus* strains was compared by using logistic regression model and Spearman's rank sum correlation test respectively.

Results

Out of the 230 raw pork samples, 48 samples gave positive results for *S. aureus* growth. Therefore, the prevalence of *S. aureus* in raw pork from retail markets in the Gampaha District was 21% (48/230) and there was no significant difference between retail wet markets and supermarkets. Of the *S. aureus* isolates, 22.5% (9/40) were positive for SEA producing strains. There was a statistically significant association between the level of staphylococcal contamination of raw pork and detection ($p \leq 0.05$) and the level of SEA ($p \leq 0.05$) produced by the *S. aureus* strains.

Conclusion

Contamination of raw pork samples in retail markets with *S. aureus* enterotoxigenic type A was confirmed. Level of staphylococcal contamination is a predictive tool for the presence of SEA and the occurrence of SFP.

OP 7

A descriptive study on prevalence of respiratory viruses in patients with respiratory symptoms during SARS-CoV-2 pandemic in North Central Province, Sri Lanka

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Introduction

Acute respiratory infections (ARIs) are a persistent public health problem worldwide. Control measures adopted during COVID-19 pandemic have influenced the epidemiology of common respiratory viruses.

Objectives

Identification of the respiratory viruses present in symptomatic patients clinically suspected to be infected with SARS-CoV-2 in North Central Province including co-occurrence of viral etiologies.

Design, setting and methods

Total number of 384 nasopharyngeal swabs from SARS-CoV-2 infection suspected symptomatic patients were analyzed for 18 respiratory viruses from March to May 2021 in the North Central Province, Sri Lanka. RespiFinder® 2SMART Single Tube Multiplex Amplification in Real Time Kit PathoFinder (Maastricht, Netherlands) was used for detection of respiratory viruses excluding SARS-CoV-2. Respiratory panel kit included Rhinovirus/Enterovirus (RV/EV), Influenza A, B, Influenza A H1N1, human metapneumovirus (hMPV), Adenovirus, Parainfluenzavirus (PIV) 1, 2, 3, 4, Respiratory syncytial virus (RSV) A/B, Coronaviruses (CoVs) NL63, 229E, OC43, HKU1 and Bocavirus. Results from the real-time RT-PCR for SARS-CoV-2 were obtained from the laboratory records.

Results

The study cohort included 245 (63.8%) male and 139 (36.2%) female ages between 0–87 years. 231 (60.2%) samples were positive for at least one virus excluding SARS-CoV-2 and 29 (7.6%) samples were found to be positive for SARS-CoV-2. Coronavirus 229E (157, 40.9%) was the most commonly identified virus. 51 samples (13.3%) were positive for more than one virus, with the commonest combination being Coronavirus 229E and RV/EV (26, 50.9%). Coronavirus NL63/HKU1 (04), 229E (17), RV/EV (03) and Bocavirus (01) found to be coinfected with the SARS-CoV-2. An absence of Influenza, RSV and hMPV with low prevalence of Adenovirus (4, 1%), Bocavirus (6, 1.6%) and PIV3 (23, 6%) during the COVID-19 pandemic were observed.

Conclusion

All health care settings should be aware about the possible resurgence of common respiratory viruses showing a decreased prevalence in the pandemic period, after relaxation of COVID-19 prevention and control measures.

OP 8

Comparison of a rapid antigen test with a point of care rtRT-PCR for the detection of SARS -CoV-2

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Introduction

Real time RT-PCR (rtRT-PCR) is the gold standard for the diagnosis of SARS-CoV-2 infection and it has high sensitivity and is able to detect low amounts of RNA. Testing for SARS-CoV-2 infection is a criticalelement of the public health response to COVID-19**.** However, there is an ongoing need for reliable assays for timely and easy detection of individuals with acute SARS-CoV-2 infection. Manufacturer-reported performance data on rapid antigen test kits seem convincing, but real-world data are limited specially from low/middle income countries.

Objectives

The present study aimed to compare a rapid antigen detection test (RAT) with a rapid point of care real- time RT-PCR (POC-rtRT-PCR) assay approved by the Ministry of Health –Sri Lanka to determine the test indices of the antigen detection test for the detection of SARS-CoV-2 infection.

Design, setting and methods

Fifty (n=50) nasopharyngeal swab samples previously analysed by POC-rtRT-PCR (Truenat™ COVID-19 assay) at the Teaching Hospital Peradeniya were subjected to the RAT (SD-Biosensor rapid antigen assay). Sensitivity and the specificity for the RAT were calculated to evaluate the performance of RAT using the POC-rtRT-PCR results as reference. POC-rtRT-PCR used here for comparison has been validated with Taqman real time PCR system with 100% agreement.

Results

Overall, the RAT showed high specificity and low sensitivity. Sensitivity was 100% for high viral load samples with a comparator PCR Ct value <20.3 and the specificity of the RAT was 92.3 %. The sensitivity decreased to 48% when tested samples with Ct values from 20.9 to33. The sensitivity of 48% is lower than the sensitivity of >90% claimed by the manufacturer.

Conclusion

In conclusion, rapid Ag tests appeared to be highly sensitive and specific in detecting SARS-CoV-2 infections with lower Ct values (high viral loads). The RAT may be a quick and easy to perform alternative to identify individuals with high SARS-CoV-2 loads.

OP 9

Longitudinal evaluation of anti-SARS-CoV-2 neutralizing antibody levels in 3-dose vaccinated haemodialysis patients shows a good 3rd dose antibody response

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Introduction

Chronic kidney disease patients on haemodialysis (HD) were given priority for COVID-19 vaccination due to increased disease risk.

Objectives

To evaluate seroconversion rate, neutralizing antibody levels and longitudinal antibody dynamics to mixed vaccination against COVID-19 in a cohort of HD patients compared to healthy controls and assess patient factors associated with antibody levels.

Design, setting and methods

A longitudinal cohort study was done at the Nephrology units of National Hospital Kandy and Teaching Hospital Peradeniya, including 74 HD patients. Sampling was performed at time-points (TP) 1-1-month post 2nd dose of AZD1222 (ChAdOx1) vaccine, TP2- 4 months post 2nd dose, TP3- 6 months post 2nd dose, and TP4- 2 weeks post 3rd dose vaccination with Pfizer-BioNTech (BNT162b2) vaccine.

Samples corresponding to TP1, TP2 and TP4 were obtained from 37 healthy health care workers (HCW) as a control group. Serum samples were tested for anti-SARS-CoV-2 specific neutralizing antibodies (seroconversion - having antibodies above assay cutoff; antibody level- percentage neutralization) using GenscriptcPass™ pseudoviral neutralization kit. Demographic and clinical details were obtained using an interviewer administered questionnaire.

Results

Mean age of the HD cohort was 54.1yrs (vs HCW mean age, 42.6yrs, $p<0.05$) while both cohorts were gender matched ($p>0.05$). Percentage seroconverted and mean antibody level (MAB) in the HD cohort (vs HCW) were TP1-79.7% (HCW-100%), TP1 MAB-83.7% (HCW-96.7%, $p<0.0001$); TP2- 60.7% (HCW- 94.6%), TP2 MAB- 77.4% (HCW- 81%, $p>0.05$); TP3- 66.7%, TP3 MAB-86.2%; TP4- 95.2% (HCW- 100%), TP4 MAB-94.3% (HCW-95.2%, $p<0.0007$). By TP2, 13/43 initially seropositive HD patients had become seronegative while 24 /43 initially seropositive patients showed a reduction in their neutralizing antibody levels by 18% from TP1 to TP2. However, the antibody levels were above the assay cutoff and therefore this patients were considered seropositive. In contrast, only 2/37 initially seropositive HCWs became seronegative by TP2, while those who remained seropositive (35/37) showed a reduction in MAB of 15.7% ($p>0.05$). There was no association between level of antibody and age, gender, duration on dialysis, history of hospitalization or history of diabetes mellitus, dyslipidemias, hypertension and ischemic heart disease.

Conclusions

Initial two-dose course of ChAdOx1 vaccine resulted in lower seroconversion and neutralizing antibody levels in HD population compared to controls, though this was corrected to a great extent by the 3rd dose mixed vaccination with BNT162b2.

OP 10

Emerging variants of SARS-CoV-2 in Sri Lanka

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Introduction

SARS-CoV-2 pandemic has resulted in more than 600,000 cases and 15,000 deaths in Sri Lanka by January 2022. SARS-CoV-2 variant surveillance is important for early identification of the public health trend of pandemic and its impact on health for initiating effective measures in time. This study was conducted to identify the SARS-CoV-2 variants circulating in Sri Lanka.

Objective

To identify temporal distribution pattern of SARS-CoV-2 variants in Sri Lanka.

Design, Setting, and Methods

Gene sequencing results of 426 respiratory samples from COVID-19 patients which were received from several districts of the country, from June 2021 to January 2022 were analyzed. Whole genome sequencing was carried out using either AmpliCoV or Midnight protocols on Oxford Nanopore Technology. Variant profile was analyzed over 8 months.

Results

Alpha was the leading SARS-CoV-2 variant during June 2021 (93%) and declined over 3 months (14%). Sub-lineage of Alpha (Q.8) sporadically emerged only in September and December 2021 (2-3%). Delta was recorded from June (7%), increased in August (77%) and continued (~34%). Various sub-lineages of Delta emerged in August 2021 and continued till January 2022. Delta sub-lineage AY.28 was dominant in October and November 2021 (50% and 33%) while AY.104 was dominant in December 2021 (30%). Omicron-B.1.1.529 emerged in early January 2022 (28%) additionally to the already dominantly prevalent Delta. It was the Omicron-BA.1 lineage mainly detected among overseas returnees during that time. By mid-January 2022, Omicron detection rate was 35% and the BA.1 Omicron variant was detected in community samples as well. By the end of January 2022, Omicron detection rate (60%) surpassed the detection rate of Delta and the emergence of BA.2 Omicron variant was also noted. Other variants B.1.411 and B.6 were recorded as one case each in December and January respectively.

Conclusions

Local emergence of SARS-CoV-2 variants of concern Alpha, Delta and Omicron have been noted in this study in parallel to the global epidemiological trend of the pandemic. The impact of locally prevalent different SARS-CoV-2 variants on health care system needs to be further studied.

PP 1

Evaluation of diagnostic value of sputum Gram stain and comparison of semi-quantitative and quantitative culture methods in patients treated at Central Chest Clinic

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Introduction

Sputum Gram stain and culture are important to identify pathogens in lower respiratory tract infections (LRTIs). Quantitative culture is considered the 'gold standard' as semi-quantitative method misinterprets upper respiratory tract commensals as pathogens.

Objectives

Diagnostic value of sputum Gram stain was assessed, and semi-quantitative and quantitative culture methods were compared. Further, antimicrobial susceptibility profiles of the pathogenic bacteria in sputum culture of patients treated at the Central Chest Clinic (CCC) were evaluated.

Design, setting and methods

A cross sectional study was carried out for 4 months' duration in 316 patients presented to the CCC with LRTIs as diagnosed by the treating physician. There were community acquired LRTIs as well as patients with acute exacerbations of chronic lung diseases.

A convenience sampling method was used. Sputum Gram stain was assessed for the quality following Murray and Washington criteria and examined for predominant morphotypes. All samples were subjected to both semi-quantitative and quantitative culture methods.

Results

Majority (71%, n=224) had underlying chronic lower respiratory tract diseases and bronchiectasis (n=131,42%) was the commonest. Out of 202 good quality samples, 33%(n=66) had predominant morphotypes. Predominant morphotypes were significantly high in grade 4,5 samples compared to grade 3($p<0.001$). Sputum Gram stain showed 93% (217/233) specificity and 60% (49/81) sensitivity with 88% (217/249) and 75% (49/65) negative predictive value (NPV) and positive predictive value for quantitative culture method respectively. Therefore, direct Gram stain had substantial agreement with culture($K=0.658$).

There was no significant difference in pathogen isolation between two culture methods. Though the number was less, typical pathogens were similarly isolated from both methods (4 *S.pneumoniae*, 2 *H.influenzae*, 4 *H.parainfluenzae*, 6 *M.catarrhalis*). Semi-quantitative culture had 92% (76/83) sensitivity, 95% (221/233) specificity and 97% (221/228) NPV. Therefore, both culture methods were in almost perfect agreement($K=0.848$). Most (36%, n=28) of the infections were caused by *Pseudomonas aeruginosa* followed by *K.pneumoniae* (n=14). Multidrug resistant organisms were rarely isolated.

Conclusion

Direct Gram stain of sputum is useful to predict the culture results in LRTIs. The quantitative and semi- quantitative sputum culture methods showed no significant difference in the isolation of bacterial pathogens.

PP 2

Distribution of meropenem Minimum Inhibitory Concentration (MIC) among Extended Spectrum Beta Lactamase (ESBL) producing *Enterobacteriaceae* isolates from a University Hospital in Sri Lanka

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Introduction

The emergence and rapid dissemination of carbapenem resistant *Enterobacteriaceae* is a public health concern globally causing infections with limited therapeutic options.

Objective

To evaluate the distribution of meropenem MIC among ESBL producing *Enterobacteriaceae* isolates.

Design, setting and methods

A descriptive study was conducted using 59 clinically significant ESBL producing *Enterobacteriaceae* isolates identified according to CLSI M100 2021. The meropenem MIC was determined using commercial E-test strips (Liofilchem, Italy) and Microbroth Dilution (MBD) technique according to CLSI M07-09 using Meronem powder for Injection (Pfizer). ATCC 25922 *E. coli* was used as a control strain as instructed by the kit manufacturer and CLSI M07-09.

Results

The 59 isolates were from urine (23), pus (16), blood (11) and sputum (09). Majority of MIC values according to E test results clustered from 0.023µg/ml to 0.064µg/ml with a mean MIC of 0.049µg/ml (SD=0.071) while the MIC values of majority ranged from 0.0125µg/ml to 0.8µg/ml according to MBD with mean MIC of 0.222µg/ml (SD=0.277), both far below the MIC breakpoint values set by EUCAST and CLSI, 2021. MIC values from MBD was higher compared to that of E test causing a statistically significant difference between the two means (P=0.037), determined using Two Factor ANOVA. MIC50 and MIC90 of E test method was 0.032µg/ml and 0.064µg/ml while it was 0.1µg/ml and 0.4µg/ml in MBD method. The plausible reasons for this difference may be use of parenteral antibiotic preparation, not using cation adjusted Muller Hinton Broth and possible minor errors when preparing the inoculum in MBD method. Only one isolate was classified as intermediately resistant to Meropenem (MIC - 3.2µg/ml) with MBD. For both methods, MIC values of control organism were within the quality control ranges.

Conclusion

The results imply that almost all MICs lie within the sensitive range in both methods according to CLSI and EUCAST breakpoints. Therefore, meropenem is an effective carbapenem to treat patients with ESBL producing *Enterobacteriaceae* infections in this study population. However, further studies with larger samples are required to confirm results.

PP 3

Consumption of carbapenems in a District General Hospital

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Introduction

Carbapenems are the most potent of all β-lactam antibiotics, therefore, they are reserved as the last resort therapy. Here we report an audit carried out on the consumption of carbapenems.

Objective

The objective of the study was to describe carbapenem usage in inward patients in a District General Hospital.

Design, setting and methods

The audit was carried out on a single day in District General Hospital Matara by utilizing the BHTs and other relevant ward statistics of the inward patients on antibiotics. A questionnaire was used to collect the clinical and microbiological data of the patients on carbapenems. The presence of clinically confirmed comorbidities (diabetes, chronic kidney disease, cancers, and COPD) was also noted.

Results

On the day of the audit, a total of 254 out of 572 (44.4%) inward patients were on either intravenous or oral antibiotics. Out of these patients, 9.8% (n=25) were on carbapenems. Among those, the use of meropenem and imipenem were 92% (n=23) and 8% (n=2) respectively. At the time of the audit, all the patients on carbapenems had received less than 10 days of carbapenems, while the majority (n=22, 88%) had received 1 to 5 days of either meropenem or imipenem. Among the carbapenem users, 60% (n=15) had at least one of the above comorbidities. Out of the patients who were on carbapenems, the indication to prescribe the drug was mentioned in the BHT only in 40% (n=10) of the patients. The most common indication for carbapenem use was respiratory tract infections (32%, n=8), followed by skin and soft tissue infections (28%, n=7), and urinary tract infections (16%, n=4). Appropriate cultures had been obtained only in 52% (n=13) of the carbapenem users. However, only 2 positive cultures (8%) (one blood and one urine, both ESBL positive) had led to the initiation of a carbapenem.

Conclusion

The point prevalence of carbapenem use in the concerned healthcare facility was 9.8%. As only one half of the carbapenem users had cultures taken, the importance of obtaining appropriate cultures should be emphasized.

PP 4

Association of haematological and biochemical parameters with different clinical entities in culture positive melioidosis

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Introduction

Melioidosis is a multi-spectrum disease caused by *Burkholderia pseudomallei*. Till the diagnosis is made by culture or antibody titre, a high index of clinical suspicion is needed to start empirical antibiotics which is life-saving in severe sepsis.

Objectives

To determine the association of haematological and biochemical parameters with different entities in melioidosis in order to assist clinical diagnosis.

A retrospective, descriptive study of culture positive melioidosis cases was carried out from December 2014 to January 2022 in a major tertiary care hospital, Sri Lanka. Data were obtained from the melioidosisdatabase in the hospital and the haematological and biochemical parameters of the different disease presentations were compared.

Results

There were 61 culture positive melioidosis cases comprising of 43% deep-seated abscesses, 21% pneumonia, 11% septic arthritis and 25% other pathologies like bacteraemia, endocarditis, etc. Blood culture positivity (with or without other cultures) was 70% (N=43) while pus alone comprised 16% (N=10) and respiratory samples alone 7% (N=4). Case fatality rate was 18% (11/61) in this cohort.

Among the deep-seated abscess cases, 28% had a platelet count more than $400x10^9$/L and the association was statistically significant (Fishers 2x2, p = 0.0472). As expected, there was a significant association between relatively low ($\leq$160) and high ($\geq$320) melioidosis antibody titres with the acute or chronic nature of the disease presentation (p=0.0433). Mortality was significantly associated with renal derangement evident by increased serum creatinine, reduced eGFR and reduced urine output collectively on presentation (p=0.0170). There was no statistically significant association between extremes of white cell count ($<4x10^9$ or $>11x10^9$/L) or high CRP (>100 mg/L) and positive blood cultures or between high ESR (>100/1st hr) and the duration of symptoms at presentation.

Conclusions

A high platelet count may indicate the presence of deep-seated abscesses in melioidosis. Derangement of renal functions may indicate a poor prognosis. The association between high CRP and ESR and the presence of bacteraemia or the chronicity of the illness needs to be studied with a larger sample.

PP 5

Respiratory virus infections in COVID-19 suspected symptomatic patients in the Central Province of Sri Lanka

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Introduction

With the arrival of coronavirus disease 2019 (COVID-19) in Sri Lanka in March 2020, several preventive measures were taken to avoid severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. These measures also may have contributed to minimize the circulation of other respiratory viruses. However, the aetiological diagnosis of acute respiratory tract infections (ARTI) during the pandemic is mainly focused on SARS-CoV-2 while the other viral aetiologies for ARTI have been ignored.

Objective

The present study aimed to identify the frequency of respiratory syncytial virus (RSV), parainfluenza viruses (PIV), influenza virus, human metapneumo virus (hMPV), human corona virus C229E (hCoV - C229E), human corona virus NL 63 (hCoV - NL63), human boca virus (hBoV), human rhino / enterovirus, adeno virus (AdV) and SARS-CoV-2 in a selected samples of COVID-19 suspected patients with ARTI symptoms.

Design, setting and methods

A total of 422 respiratory samples, received to the Virology Laboratory of the National Hospital, Kandy from COVID-19 suspected symptomatic patients, were simultaneously tested using real time RT-PCR for SARS-CoV-2 and real time PCR melting curve analysis for other respiratory pathogens from 1st of January to 31st of December 2021. The demographic and clinical data of the affected patients were collected from the medical records.

Results

Of the 422 patients tested males were 65% (274/422) and females were 35% (148/422). Among them 8% (32/422) patients with suspected COVID-19 were eventually confirmed to have SARS-CoV-2 infection. Overall detection rate of other respiratory pathogens were 45% (191/422). Among them human rhino / enterovirus, RSV, PIV, influenza virus, hCoV - C229E, hAdV, hCoV - NL63 and hBoV were respectvely 23% (43/191), 18% (35/191), 13% (24/191), 9% (17/191), 7% (14/191), 7% (13/191), 6% (12/191), 4%(7/191). Moreover, a single hMPV was detected. Mixed infection with one or more viruses was observed as 11% (22/191). Age of the patients ranged from 14 days to 85 years. Positivity of other respiratory viruses was higher in males (68%, 130/191) than in females.

Conclusion

The current findings highlight the importance of diagnosing the other respiratory virus infections during the ongoing COVID-19 pandemic to understand the risk of these viral infections.

PP 6

Prevalence of neutralizing antibodies among healthcare workers vaccinated against SARS-CoV-2 at 6 weeks and 6 months following primary course of vaccination in two teaching hospitals

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Introduction

Vaccination is an important strategy to control COVID-19 pandemic. The presence of neutralizing antibodies (NAbs) indicates protection against infection. Sri Lankan healthcare workers (HCWs) were vaccinated with two doses of Oxford-AstraZeneca viral vector vaccine three months apart as the primary course. It is speculated that certain comorbidities causing immunosuppression may hamper the production of NAbs.

Objectives

To determine and compare the prevalence of NAbs against SARS-CoV-2 among HCWs vaccinated with 2 doses of Oxford-AstraZeneca vaccine at 6 weeks and 6 months from the second dose.

To determine the co-morbidities for non-development of NAbs following vaccination

Design, setting and methods

A descriptive cross-sectional study was carried out to determine the presence of NAbs in serum in a random sample of HCWs in two teaching hospitals who were vaccinated with 2 doses of vaccine, using C Pass ™ Neutralization Antibody Detection ELISA Kit at 6 weeks and 6 months following the 2nd dose. An interviewer administered questionnaire was used to collect data on co-morbidities. A total of 150 HCWs, including 128 at 6 weeks, 77 at 6 months and 55 at both 6 weeks and 6 months were tested.

Results

Out of 128 HCWs, 89.8% (n=115) had NAbs at 6 weeks. Out of 77 samples, 75.3 % (n=58) had antibodies after 6 months. In the comparison group (n=55), 74.5% (41/55) demonstrated NAbs after 6 months while 21.8 % (12/55) showed waning of NAbs by 6 months. Two HCWs (3.6%) neither had antibodies at 6 weeks nor at 6 months. Among participants who did not have NAbs when tested either at 6 weeks or 6 months (at least once in either occasion) (n=30), three had diabetes mellitus, one of whom was on steroids and NSAIDs for an autoimmune disease, two were on short course of antibiotics and one was on NSAIDs.

Conclusions

Majority of HCWs developed NAbs after 6 weeks and around 21% showed waning of antibodies around 6 months. Diabetes, autoimmune disease and certain drugs are possible risk factors for non-development of NAbs.

PP 7

Incidence of asymptomatic SARS-CoV-2 infections among healthcare workers at a tertiary care hospital in Colombo

Senanayake MS, Arachchige NDS, Dharmasiri AWR, Weerathunga APAI, Kaushalya AGG, Athukorala S, Janage SN

Department of Molecular Biology, Medical Research Institute, Colombo, Sri Lanka

Introduction

SARS-CoV-2 was first identified in Wuhan, China in December 2019. The infection has since spread worldwide and was declared as a global pandemic by WHO on 11/03/2020.

SARS-CoV-2 virus can cause both symptomatic and asymptomatic infections and more than 46% of cases are found to be asymptomatic but still infectious to others.

Healthcare workers in Sri Lanka are vaccinated mostly with ChAdOx1 nCoV-19 vaccine (Covishield- AZD1222) and boosted with BNT162b2 vaccine (Pfizer). Both these vaccines are known to produce only S antibodies (antibodies against the spike protein) in their body but not the N antibodies (antibodies against the nucleocapsid protein). Therefore, N antibody response among them is reflective of natural exposure to the virus.
Subclinical infections contribute to spread the virus, but it could help boosting up the immunity at the same time which might be beneficial in long run.

Objective

To assess the incidence of asymptomatic SARS-CoV-2 infections among healthcare workers at a tertiary care hospital in Colombo.

Design, setting and methods

COVID-19 antibody results of 100 healthcare workers tested with Roche Elecsys N antibody assay in the routine screening service were analyzed in this study. All of them had been vaccinated, but did not have a history of symptomatic COVID-19 at the time of sample collection. Healthcare workers vaccinated with Sinopharm vaccine or with a history of immune suppression were excluded.

Results

Out of 100 healthcare workers, 20% were positive for N antibodies reflecting the asymptomatic SARS- CoV-2 infection rate in this cohort. The asymptomatic infection rate was different among medical officers (14%), nursing staff (14%), pharmacists (75%; 3 out of 4), assisting staff (30%) and office staff (13%). Asymptomatic infection rate was 24% and 16% respectively in males and females with the rates of 15% and 24% respectively in two age groups 20-40 years and 41 -60 years.

Conclusion

Asymptomatic SARS-CoV-2 infection rates varied among different categories of healthcare workers. A prospective study is necessary to assess the impact of asymptomatic SARS-CoV-2 transmission on the health care system and community.

PP 8

First case of COVID-19 associated mucormycosis (CAM) in Sri Lanka- A case report

Pitagampola MN[1], Gunarathna MADP[1], Jayasinghe S[1], Dayaratne M[1], Jayasena KDNUD[1] Welagedara PGRUM[2], Sigera LSM[2], Nanayakkara G[1], Jayasekera PI[2]

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Introduction

Mucormycosis is an angioinvasive infection caused by fungi belonging to the order Mucorales. The disease is not uncommon among Sri Lankan immunocompromised patients and the commonest presentation is rhinocerebral mucormycosis. We report the first case of CAM from Sri Lanka.

Case report

A 60-year-old diabetic patient who was not on regular oral hypoglycaemic drugs, presented with left sided periorbital swelling and pain. She was recently managed at a local hospital for diabetic ketoacidosis and has had a history of fever and cough prior to hospitalization.

On examination she was afebrile, pulse rate was 96 bpm, blood pressure was 130/80 mmHg, GCS was 14/15 with bilateral crepitations in lungs. Left periorbital cellulitis along with ophthalmoplegia and proptosis were present. Furthermore, there was necrosis in the nasal cavity and upper left eye lid. Her capillary blood sugar level was 190 mg/dl. She was started on IV liposomal amphotericin B, IV antibiotics and anti-hyperglycaemic drugs with the suspicion of mucormycosis. Chest X-ray showed bilateral consolidations and her COVID-19 real time PCR Ct values were E-33.3 and N-33.3. Computed tomography scans showed hyper density areas over the ethmoid sinus and bilateral frontal lobe infarctions. Direct microscopy of biopsy which was taken from necrotic material showed aseptate, broad, ribbon-like fungal filaments and the culture was positive for *Rhizopus species*.

As patients' condition was progressively worsening, she was transferred to ICU and was ventilated. Patient expired two days after admitting to the ICU before any surgical interventions being done.

Discussion

This patient was managed at a local hospital for diabetic ketoacidosis, a well-known risk factor for mucormycosis. In the meantime, the patient was co-infected with SARS – CoV- 2 as well. Both these risk factors along with cytokine storm following SARS – CoV- 2 and the steroid use to minimize the cytokine induced reactions would have contributed simultaneously to worsen the clinical condition which needed ICU care with ventilation. This has hindered the surgical intervention of de-bulking and debridement of necrotic tissues.

(*A poster was presented on this case at the Congress of the International Society for Human and Animal Mycology (ISHAM Asia) in 2021)

PP 9

SARS-CoV-2 infection in an immunocompromised patient; reinfection or persistent infection?

Asmir WM [1], Janage SN [2], Wimalaratne KBD [1], Dharmasiri AWR [2], Arachchige NDS [2], De Silva ADP [1], Chathurani PM [1], Sumathipala S[1]

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Introduction

There was a Non-Hodgkin's lymphoma (NHL) stage – 4 patient (with immune suppression) who remained SARS-CoV-2 PCR positive for about six months.

Case Report

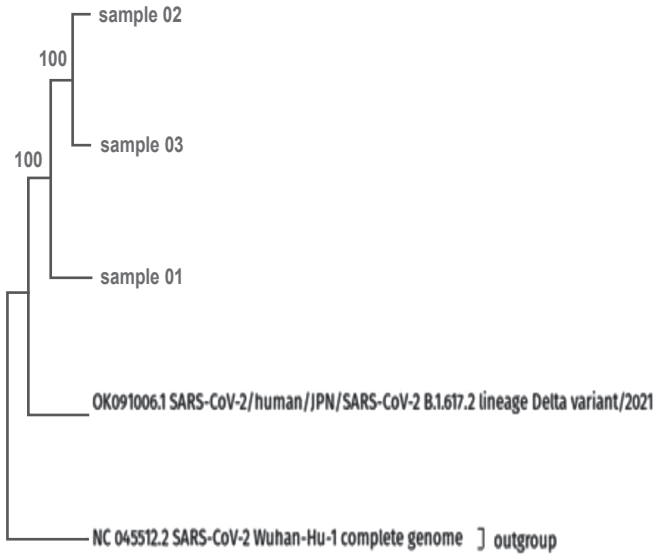
This 61 years old patient was admitted to Apeksha hospital, Maharagama on 24th August 2021 for chemotherapy. SARS-CoV-2 rapid antigen screening test became positive. PCR was positive with a Ct value of 10. A repeat PCR done after 5 weeks was also positive with a Ct value of 8. But the patient was asymptomatic and sent home as the RAT was negative by that time.

He was readmitted on 18.12.2021 with the complaint of severe earache. on screening, SARS-CoV-2 PCR was positive with a Ct value of 15, but the ENT examination was normal.On 07.02.2022, he was readmitted to emergency treatment unit with difficulty of breathing and headache. His chest X-ray revealed pneumonia. SARS-CoV-2 PCR was positive with Ct 15. WBC count was high with raised CRP. His condition worsened and passed away on the day of admission.

SARS-CoV-2 gene sequencing was done on three PCR positive samples. SARS-CoV-2 genome analysis was performed with Oxford nanopore gene sequencing on three samples labelled as sample 1, 2 and 3.

Discussion

All samples had Delta variant and the phylogenetic tree showed that they were from the same clade.



It was not clear whether it was the viable virus detected persistently as the virus culture facilities were not available. “Persistent infection” was more likely scenario than “reinfection” as the Delta variant from the same clade has been detected in all three samples. The last sample was positive for Delta despite Omicron being the main variant in the country by that time.

PP 10

Complicated left atrial mural endocarditis caused by methicillin resistant *Staphylococcus aureus* – A rare presentation

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Sri Lanka

Introduction

Infective endocarditis caused by methicillin resistant Staphylococcus aureus (MRSA) with large vegetations, complicated by embolization and moderate pericardial effusion is a severe life-threatening condition.

Case report

A 28 years old lady who had a history of membranoproliferative glomerulonephritis (MPGN) since her child hood was admitted to the intensive care unit with a history of fever, loose stools, shortness of breath and altered level of consciousness. Her GCS score was 9. She was anuric since admission. Chest X ray revealed globular heart. She had elevated white cell count with neutrophil predominance. CRP was 318 mg/L and Serum creatinine 9.3mg/dL. She was initially treated with IV ceftriaxone 2g daily and IV linezolid 600mg 12 hourly following blood culture. IV linezolid was added for the Gram-positive cover on the background of deteriorating renal function.

2D Echo revealed two 10x14mm size large vegetations on left atrial wall with valves unaffected. Moderate pericardial effusion was detected. Pericardiocentesis revealed purulent pericardial fluid. All 3 peripheral blood cultures and the pericardial fluid culture isolated MRSA. Infective endocarditis was confirmed according to the modified Dukes criteria and antibiotic regimen was changed to IV vancomycin. NCCT brain revealed multiple infarctions on both cerebral hemispheres and left cerebellum. Haemodialysis was done 5 times however patient remained anuric. Vegetation size was same on repeat 2D echo. Cardiothoracic surgical intervention was not possible due to renal failure and impending cardiac tamponade. Vancomycin TDM was not available. Oral rifampicin was added following MDT discussion. Patient died while on IV vancomycin and oral rifampicin given for 7 days and 2 days respectively.

Discussion

Primary mural endocarditis is a rare finding. Pericarditis would have resulted from MRSA bacteremia seeding the pericardium. Immunosuppression due to MPGN would have been a risk factor. Rifampicin was added as a last resort considering the vegetation size and drug penetration, though it is not routinely recommended. Further therapeutic options available were very limited. Because the mortality rate increases with complications, aggressive antibiotic therapy and surgery, combined with specific treatments for the complications, are necessary.

PP 11

Pneumococcal sepsis with optochin resistant *Streptococcus pneumoniae;* a case report

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Introduction

Streptococcus pneumoniae is a major cause of morbidity and mortality at extremes of age. Accurate identification and antimicrobial sensitivity testing are important for appropriate treatment.

Differentiation of *S. pneumoniae* from viridans group Streptococci is performed using the optochin test, bile solubility test, capsular antigen detection methods, automated identification and molecular methods. Routine laboratories usually depend on optochin sensitivity.

Case report

A one-and-a-half-year-old baby boy was admitted with acute onset fever and productive cough. He had no clinical evidence of otitis media or meningitis and had not received pneumococcal vaccine.

Systemic examination was unremarkable except for tachycardia and tachypnoea. White cell count was $22.78x10^9/m^3$ with 76% neutrophils. His CRP was 103 mg/L. Right-sided inflammatory shadows were seen in the chest X-ray. Intravenous cefuroxime was started after blood culture.

After eleven hours of incubation, the blood culture became positive for Gram-positive cocci in chains with lanceolate diplococci. Considering the clinical history and typical Gram stain appearance, latex agglutination test for *S. pneumoniae* was performed on blood culture supernatant using Wellcogen™ bacterial antigen kit and it became positive. Alpha-haemolytic colonies grew on blood and chocolate agar and no growth on MacConkey agar. The optochin test which was performed repeatedly using quality- controlled optochin discs failed to give any inhibitory zones. The isolate was identified as *S.pneumoniae* using Vitek 2 identification system. It was sensitive to cefotaxime with the minimum inhibitory concentration of 0.5 µg/ml. Treatment was escalated to ceftriaxone and continued for seven days with satisfactory clinical and inflammatory marker response.

Discussion

Knowledge of the existence of optochin-resistant *S. pneumoniae* should alert the clinical microbiologists to widen the scope of identification for confirmation where necessary.

PP 12

Disseminated *Fusarium* infection in an immunocompromised patient - Successful outcome with combined antifungal therapy

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Introduction

Fusarium species are plant pathogens which exist ubiquitously in the environment. While they can cause superficial and subcutaneous infections in healthy individuals, they can give rise to deep and disseminated infections in immunocompromised patients,particularly in patients with haematological malignancies resulting in a high risk of mortality.

This case emphasizes the importance of early diagnosis and proper management of disseminated fungal infections in immunocompromised patients to achieve a favorable outcome.

Case report

A 19-year-old male diagnosed with B Cell Acute Lymphoblastic Leukaemia developed painful erythematous skin lesions over the limbs on 10th day of febrile neutropenia following induction chemotherapy despite being on broad spectrum antibiotics. They gradually turned in to blisters and ruptured to leave ulcers with necrotic centers.

Skin biopsy was performed, and its direct smear revealed fungal filaments directing towards the diagnosis of disseminated fungal infection. Later fungal culture became positive for *Fusarium* species. Therefore, he was initially managed as disseminated Fusarium infection with voriconazole monotherapy for 2 weeks duration. However, skin lesions recurred following an initial response requiring combined antifungal therapy for another 2 weeks with amphotericin B and voriconazole which resulted in complete resolution of symptoms with uneventful follow up for 1 year.

Discussion

Fusarium species are widely distributed in the environment and are commonly encountered in human infections. They are the second commonest mould causing fungal infections in immunocompromised population, particularly, those with haematological malignancies resulting in high morbidity and mortality. Refractory fever is the commonest manifestation of disseminated fusariosis followed by cutaneous lesions and sino-pulmonary infections. Therefore, any suspicious cutaneous lesions should be biopsied and investigated.

Early clinical suspicion and diagnosis is necessary to commence on appropriate antifungal therapy, to achieve an optimum outcome in susceptible patients. Studies have shown that amphotericin B and voriconazole combination to have synergism and hence is effective in disseminated fusariosis particularly when inadequate response is achieved with monotherapy.

A poster was presented on this case at the Congress of the International Society for Human and Animal Mycology (ISHAM Asia) in 2021.

PP 13

A case of cerebral aspergillosis in Sri Lanka

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Introduction

Cerebral aspergillosis is a rare condition that is associated with high mortality. It is reported predominantly in immunocompromised patients. Nonspecific clinical and radiological features may contribute to difficulty and delay in diagnosis, resulting in poor prognosis. Timely laboratory diagnosis of an appropriate specimen may be lifesaving.

Case report

A 74-year-old female presented with a frontal headache for two weeks. She has been diagnosed with low- grade lymphoma and had completed chemotherapy and high-dose prednisolone four weeks prior to this presentation. Other than the frontal headache, which progressed over two weeks, she did not disclose any associated symptoms. Physical examination was normal, with no signs of raised intracranial pressure nor a CNS infection. Basic investigations revealed no abnormalities, and WBC was 7.5 x 10^9/L and CRP was 7 mg/L.

An MRI of the brain indicated right frontal sinusitis with a secondary small abscess in the right frontal lobe inferiorly. Accordingly, she was treated with parenteral antibiotics for a bacterial infection and discharged. The patient presented with a headache again after three months. Repeat MRI of the brain revealed an increase in the size of the lesion in the right frontal lobe and the possibility of a cerebral tumour was suggested. A diagnostic biopsy was performed, and the specimen was subjected to fungal studies. The direct microscopic examination revealed fungal filaments and the culture yielded a pure growth of *Aspergillus fumigatus*.

The patient was started on intravenous amphotericin B, followed by oral voriconazole. The headache gradually subsided with antifungal therapy. The duration of therapy was guided by serial radiological imaging, and the patient achieved complete recovery at the end of one-year of treatment. She remains asymptomatic to date, after completing two years of treatment.

Discussion

Immunocompromised patients with cerebral aspergillosis may present with minimal clinical symptoms and signs. Obtaining a proper specimen for laboratory testing is vital to arrive at a definitive diagnosis. Radiological investigations may play an important role in the diagnosis and follow-up of patients with cerebral aspergillosis.

PP 14

Acute invasive *Aspergillus* rhinosinusitis presenting as multiple cranial nerve palsy: A case report

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[1]Teaching Hospital Karapitiya, Sri Lanka,[2] Medical Research Institute, Colombo, Sri Lanka

Introduction

Aspergillus species are ubiquitous fungi. Acute invasive *Aspergillus* rhinosinusitis is a rare clinical entity. Here we report a patient presented with multiple cranial nerve involvement following acute invasive *Aspergillus* rhinosinusitis

Case report

A 47-years-old female with uncontrolled diabetes mellitus presented with left-sided headache and nasal congestion for one week, followed by left hemifacial numbness, deviation of the mouth, numbness inside the mouth, double vision, and difficulty in speech for three days. On examination, she was afebrile and had dilated left pupil, a blackish palatal ulcer with II, III, IV, V, and VI cranial nerve palsy.

Her white cell count was 17.72 x 10^3/mm^3 with a neutrophil predominance. The CRP, ESR, and fasting blood sugar were 61mg/dL, 137mm/1st hour, and 216mg/dL respectively. The CSF full report revealed 2 polymorphs/mm^3, 14 lymphocytes/mm^3, 67mg/dL proteins, and 154mg/dl glucose (random blood sugar 312mg/dl), while culture yielded no growth.As the clinical picture was suggestive of mucormycosis, intravenous liposomal amphotericin B 3mg / kg per day was started. MRI brain revealed bilateral maxillary and sphenoidal sinusitis and lacunar infarcts in the left cerebral peduncle of the midbrain and left pons at the trigeminal nerve region. The functional endoscopic sinus surgery (FESS) revealed bilateral fungal sinusitis and necrosis of the left posterior part of the middle turbinate and the nasal septum. The direct smear of fungal debrisshowed fungal filaments suggestive of *Aspergillus* species. The culture yielded *Aspergillus flavus*. With aetiological identification, the antifungal treatment was switched to voriconazole after 18 days of liposomal amphotericin.

The patient clinically responded to the antifungal treatment together with the surgical debridement and the antifungal treatment was continued until she achieved a clinical, radiological, and microbiological cure.

Discussion

The presence of a necrotic palatal ulcer and cranial nerve palsy in the background of uncontrolled diabetes mellitus were in favor of the diagnosis of mucormycosis in this patient. Proper mycological diagnosis of the etiological agent is very important for the management of such cases as the recommended therapy for *Aspergillus flavus* is voriconazole. The targeted therapy and the source control contributed to the treatment's success.

PP 15

Pythium keratitis in an adolescent – A case report

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Introduction

Corneal ulceration or keratitis is usually caused by infections. Keratitis caused by a fungus-like aquatic oomycete *Pythium* is rare, but it has been reported from different regions of the world. Due to its morphological similarity, *Pythium* has been frequently mis-identified as fungi. Difficulty in diagnosis and treatment of ocular pythiosis leads to high ocular morbidity. We herein report a case of a corneal ulcer caused by *Pythium* species in an adolescent in Sri Lanka.

Case report

A 13-year-old, previously healthy boy from rural Sri Lanka presented with left ocular pain and tearing for three weeks. He denied preceding ocular trauma, but has had recently bathed in a lake. Examination revealed a corneal ulcer in the left eye and the visual acuity was only a perception of light. The ulcer did not respond to topical and systemic antimicrobial therapy. Penetrating keratoplasty was performed twice with graft failure within the first postoperative week.

Gram stain and culture of corneal buttons were negative for bacterial pathogens. However, direct smear of the first corneal button with 10% KOH revealed aseptate broad filaments with occasional right angled branches mimicking fungi of zygomycetes. The second corneal button also became positive for similar looking filaments in the direct smear. A few days later, fungal culture of both specimens yielded white, flat, expanding submerged colonies on Sabouraud Dextrose Agar. Tease mounts showed hyaline, sparsely septate broad filaments with some branches at right angles. With the compatible morphological features, the organism was identified as *Pythium* species at the Mycology reference laboratory.

Repeated intracameral and intrastromal antifungal and topical and systemic antibiotic treatment resulted in a quiet, vascularized eye with retained perception of light.

Discussion

Pythium keratitis carries a significant challenge in laboratory diagnosis due to its mycelial-like appearance. Nested PCR has a higher accuracy than standard culture identification. Medical therapy alone is insufficient as it may be resistant to many antifungal agents due to the lack of ergosterol, the target of commonly used antifungals. Therefore, high degree of suspicion is important for accurate identification inthe laboratory, which should alarm the clinicians for early, aggressive surgical intervention along with antimicrobial therapy.

PP 16

Case of a Sri Lankan child with Conidiobolomycosis

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Introduction

Conidiobolomycosis is a chronic, localized sub cutaneous infection commonly affecting immunocompetent adults. Lesions originate in the nasal mucosa & spread to adjacent sub cutaneous tissues of face causing severe disfigurement. Though the cases have been reported from W. Africa, Madagascar, India, China, South & Central America, Sri Lanka also has reported few adult patients with the disease. The organism is found in soil, decaying wood and in decomposing vegetation in tropical rain forests.

Case report

A 10-year-old boy presented with a history of nasal obstruction and progressive nasal swelling for three months duration. There was no history of sinusitis, allergic rhinitis, minor trauma or insect bites. Examination revealed a swollen, disfigured nose. The rest of the general and systemic examination was normal. Computerized tomography (CT) of head revealed sino-nasal polyposis with chronic inflammatory sinus disease. Two days later external open rhinoplasty was performed and samples were collected for laboratory diagnosis. A growth arising from right lateral wall of the nose spreading to both sides up to the nasal bridge was observed. Collected specimens were sent for histopathology and fungal studies..

Fungal filaments were seen in the histopathology slides and the patient was referred to the microbiology unit. Fungal studies revealed broad, thin-walled, irregularly branched fungal hyphae with infrequent septa, on direct microscopy and the culture was identified as *Conidiobolus coronatus.*

Treatment with oral itraconazole was started and the patient was discharged on the same. Follow up after two weeks of treatment showed significant reduction in swelling, and improvement in nasal obstruction. Treatment was continued till complete clinical recovery was achieved and for another four weeks while monitoring liver functions.

Discussion

Conidiobolomycosis is uncommon in children. Timely identification of a fungal etiology followed by appropriate treatment can prevent deformities.

Dr. Sunethra Gunasena

MBBS Diploma in Medical Microbiology MD in Medical Microbiology

Madam President, I am honored to have been requested to introduce Dr. Sunethra Gunasena specialist in medical virology.

Sunethra Gunasena nee Koralege Sunethra Perera Jayatilaka, received her primary and secondary education at Southland Balika Vidyalaya, Galle and at Devi Balika Vidyalaya, Colombo.

She completed her undergraduate education at the Faculty of Medicine, University of Colombo to obtain Bachelor of Medicine Bachelor of Surgery (MBBS) in 1981. She completed Postgraduate Diploma in Medical Microbiology in 1991 and M.D. in Medical Microbiology in 1994 from the Post Graduate Institute of Medicine, University of Colombo. She received her Board certification as Specialist in Medical Microbiology in 1997.

Dr. Gunasena started her career at the Ministry of Health in 1981 as an intern medical officer at the General Hospital, Ratnapura followed by Lady Ridgway Childrens hospital as a Medical Officer.

She joined the Medical Research Institute in 1989 and completed her post graduate studies in Virology. She was appointed as Consultant Medical Virologist, Medical Research Institute in 1997 and served there till her retirement in 2017. She was the Virologist in Charge of the Polio Regional Reference Laboratory from 2004 to 2017, of the dengue laboratory from 1997 to 2014 and the measles laboratory 2016 – 2017. She was Acting Head of Department of Molecular Biology from 2005 to 2017 and Head of the Department of Virology from 2013 to 2017. She was a member of many committees and advisory boards and worked closely with the officials from the Ministry of Health, Sri Lanka. She was a member of the National Advisory Committee on Communicable Diseases, National Committee for Certification of Poliomyelitis Eradication, National Committee for Measles, Rubella, CRS Elimination, National Polio Expert Committee and National Task Force in Microbiology. She has been a member of the South-East Asia Regional Certification Commission for Polio Eradication from 2020 to date.

The laboratories she headed were members of several global eradication programs of WHO, and she worked closely with these international partners both WHO and the Centers for Disease Control, USA. She has represented the MRI in many international forums, namely, Polio Eradication Program, Measles & Rubella Eradication Program, Dengue surveillance and JE surveillance.She joined the Faculty of Medicine, University of Ruhuna as a Senior Lecturer at the Department of Microbiology, after retirement from the Ministry of Health and serves to date.

Dr. Gunasena has contributed immensely in postgraduate training. Dr. Gunasena is a teacher, trainer, and examiner in virology for Postgraduate Diploma in Medical Microbiology, MD in Medical Microbiology and MD in Medical Virology. She was also Teacher and Trainer in postgraduate Diploma and MD in Transfusion Medicine and postgraduate Diploma in Reproductive Health.

She was appointed as a member to the Board of study in Medical Microbiology in 2006 and Secretary of Board of study 2012, which she served till her retirement in 2017.

She was a Reviewer of project proposals for higher degrees at the Universities of Kelaniya, Peradeniya, Colombo and for National Research Council and a PhD supervisor and an M Phil Examiner. She has carried out several collaborative research projects with international partners, namely, Inactivated polio vaccine mucosal boosting trial in Sri Lanka 2016 funded by WHO, Dengue surveillance tools project: funded by the European Commission (EC) 2011 to 2014, Paediatric dengue surveillance project, in partnership with the International Dengue Consortium / International Vaccine Institute 2008/ 2010.

She has over 25 publications in local and international journals and numerous presentations to her credit. She is a recipient of Presidents Awards for scientific publications 6 times and National Research Council Merit award 3 times. She meets deadlines and never needs to use excuses. We shared an office room for many years and she was an example for me to be methodical, neat and tidy. We share a love for reading although her interest was more in novels of romantic nature.

Dr Sunethra Gunasena is an exemplary scientist, a dedicated academic and a renowned researcher.

Madam President, it is my privilege to present Dr. Sunethra Gunasena for the award of the Honorary Fellowship of the Sri Lanka College of Microbiologists.

Citation read by Dr. Geethani Galagoda

Consultant Virologist,

Lanka Hospital PLC, Colombo

Dr. Kumudu Karunaratne

MBBS, Diploma (Med. Micro), MD (Medical Microbiology)

Madam President, members of the Sri Lanka College of Microbiologists and distinguished guests! I am privileged and honoured to have been requested to introduce an eminent Consultant Microbiologist, Dr. Kumudu Karunaratne.

Gallage Kumudu Deepica Karunaratne received her primary and secondary education at Musaeus College, Colombo and Visakha Vidyalaya, Colombo. She was selected to the 1st batch at Faculty of Medicine, University of Ruhuna in 1978 and obtained her MBBS with 2nd class honours and a distinction in Obstetrics and Gynaecology. After completing her internship at Castle Street Hospital for Women and at Lady Ridgeway Hospital Colombo, she began her career as a medical officer in Orthopaedics.

She joined Medical Research Institute in 1989 as a medical officer and a post graduate trainee in microbiology. She proceeded to Japan in 1990 for training in molecular techniques in enteric bacteriology under a fellowship awarded by JICA. Having completed her diploma in Medical Microbiology in 1993 and the MD in Medical Microbiology in 1997 she went to May Day Hospital, Surrey, UK for her overseas training.

On her return in 1999, she took up the post of Consultant Microbiologist in the Enteric Bacteriology & food-water lab at Medical Research Institute, Colombo while, extending her services to central laboratory for tuberculosis control, Welisara and to the LRH as well.

She assumed duties as the first consultant Microbiologist at National Cancer Institute Maharagama and initiated the Microbiology services.

In 2005, she was appointed as the first permanent Consultant Microbiologist at Lady Ridgeway Hospital for Children. She served 13 most satisfying years upgrading the microbiology services to successfully treat paediatric infections till her retirement. During her tenure, she served as the investigator in Pneumococcal surveillance network in South East Asia and carried out valuable work on acute childhood meningitis under a Ministry of Health research grant.

Dr. Karunaratne is a dedicated teacher and a trainer. She was a visiting lecturer at the Department of Microbiology of University of Colombo and University of Sri Jayewardenepura. She was also involved in teaching nurses and Medical Laboratory technicians. She was a post graduate trainer for Diploma and MD in Medical Microbiology. The trainees who were bench trained under her supervision were fortunate to learn from her impeccable skills. She was a member of the board of study in Medical Microbiology and was the coordinator of the MCQ core group in Bacteriology and Mycology, Post Graduate Institute of Medicine, University of Colombo till her retirement.

She has served as chief examiner and examiner in Diploma and in MD Medical Microbiology, screening examination for Diploma in Medical Microbiology, in MD Virology and in Diploma in Pathology conducted by the PGIM, university of Colombo. She was an examiner and coordinator in Diploma in Medical Laboratory Technology for several years.She is a dedicated member of Sri Lanka College of Microbiologists who worked tirelessly to improve the services rendered by the college. She was a council member for fourteen years, joint secretary in 1995 & in 2001, and the president in 2013/2014. With her great leadership the college undertook several projects on combating antibiotic resistance including developing national antimicrobial guidelines on empirical therapy.

Her enthusiasm towards combating antibiotic resistance was extensive. She was one of the five members in the core group of antimicrobial resistance of SLCM and a leading figure in establishing national strategic plan for combatting antimicrobial resistance in Sri Lanka. She served as the chairman of SLCM committee on development of National antimicrobial guidelines on empirical therapy which was published in 2016. She also served as a temporary advisor on antimicrobial resistance in WHO SEARO in 2015. She was a key figure in the establishment of national lab-based surveillance on antibiotic resistance.

Contributions made in her capacity as a chief coordinator, editor and as a contributor to several manuals and publications related to microbiology are outstanding. Laboratory Manual in Medical microbiology, infection control manual for hospitals, national guidelines on empirical and prophylactic use of antimicrobials, Biosafety manual for medical laboratories, health sector development project which developed 10 important guidelines are some publications she was involved in.

Dr. Karunaratne served as a member of national adversary committees namely, national infection control adversary committee, national lab-based surveillance on antibiotic resistance and subcommittee on development of quality indicators in health-related infections. She was the chairman of technical committee of National antibiotic resistance surveillance-urinary tract infections andof the national lab-based surveillance on antibiotic resistance in 2011.

She has co-authored research publications in peer reviewed journals and in national journals. She was awarded the president's award for scientific publication in 2009 & in 2013. She was a guest speaker in international conferences, academic and regional clinical sessions to share her knowledge on combating antibiotic resistance and infection prevention and control.

Dr. Kumudu Karunaratne retired in 2018 and enjoys her retirement with her husband and two children. Madam President, I present to you Dr. Kumudu Karunaratne and request you to confer her with the highest honour of the college and admit her as an honorary fellow.

Citation read by Dr. Kishani Dinapala

Consultant Microbiologist,

Teaching Hospital Kuliyapitiya

Snr. Professor Sirimali Fernando

MBBS (Col), Dip Micro (Col), MSc Clin Micro (Lond) FNASSL
(Fellow of the National Academy of Sciences Sri Lanka)
FISC (Fellow of the International Science Council)

Madam President, colleagues, family members and distinguished guests. An Honorary Fellowship is the highest honour conferred by the Sri Lanka College of Microbiologists. It is therefore a privilege and a great honour for me to have been invited to read the citation today for Prof Sirimali Fernando a mentor, longstanding colleague, science administrator, advisor and specialist who has made possible a significant advancement of science and technology in Sri Lanka. She is also a life member of the Sri Lanka College of Microbiologists for the last 34 years and was a council member from 1996 – 2004.

Professor Sirimali Fernando was born on 28th September 1958 in Colombo. Her father G.V.S. de Silva was an economist while her mother Vimala de Silva engaged in teaching. Prof Sirimali is blessed with two wonderful children Ruvini and Raveen and is a proud grandmother of three.

She completed her education at Visaka Vidyala. After graduating from Colombo Medical Faculty in 1982, she did her internship at Lady Ridgeway Hospital and De Soyza Maternity Hospital.

Her early interest in microbiology led her to join the Department of Microbiology, Medical Faculty of University of Ruhuna in 1985 and promoted as senior lecturer in 1993. She was part of the first batch of students who completed the postgraduate Diploma in Microbiology conducted by PGIM in 1988. Subsequently she worked as a Research Fellow and a Registrar/ Senior Registrar in Virology at St George's Hospital Medical School (SGHMS), London, UK for 5 years from 1989-1993. There she received intense training in clinical and molecular virology, molecular biology and research methodologies. She obtained MSc in Clinical Microbiology from the University of London in 1992.

She joined newly established Faculty of Medical Sciences at University of Sri Jayewardenepura in 1996, as a Senior Lecturer in Microbiology. She was the founder head of the Department and was the pioneer in conceptualizing and designing a state of art microbiology cum molecular laboratory complex for the Department of Microbiology in the newly established medical faculty. Further she significantly contributed to successful securing of a JICA grant that provided initial scientific equipment for the entire medical faculty which continues to be the backbone of

the faculty and the department of microbiology, providing for the research that is being conducted to-date. She revolutionized the medical curriculum at Faculty of Medical Sciences, University of Sri Jayawardenapura by introducing a clinical microbiology-oriented curriculum for the MBBS as opposed to the conventional 'microbe centric' curriculum. Further as the first coordinator of Medical Laboratory Sciences course at FMS, USJP she coordinated the development of a 4-year course leading to BSc in Medical Laboratory Science which gained international accreditation by Institute of Biomedical Sciences (IBMS) of UK.

At the age of 42 years, she was promoted to Professor in Microbiology on merit and in the following year appointed to the Chair of Microbiology at University of Sri Jayewardenepura. In 2009 she was promoted to Senior Professor of Microbiology. She has authored several books in microbiology and research methodology and has over 60 peer reviewed research publications and communications with over 1500 citations. She is a recipient of several research awards including the President's awards for Scientific Research.

In 2004, her career took a turn as a science administrator when she was invited to take up the Chairmanship of National Science Foundation of Sri Lanka where she served for 12 years. During her tenure, she was able to introduce new and diverse funding schemes to the NSF 'Grant Portfolio'. She provided leadership to digitize scientific literature in Sri Lanka, establish Sri Lanka Journals online (SLJOL) and uplifted the Journal of NSF to be indexed in the Science Citation Index (SCI).

During this period Prof Fernando also served as Science Advisor to Minister of Science and Technology and also as Sector Specialist in Scientific Affairs, playing a pivotal role in establishment of Sri Lanka Institute of Nanotechnology (SLINTEC) and Sri Lanka Institute of Biotechnology (SLIBTEC). She was also instrumental in establishing the Coordinating Secretariat for Science Technology and Innovation (COSTI) and served as honorary CEO of COSTI.

Prof. Sirimali Fernando has served on numerous Governing Boards including Sri Lanka Accreditation Board (SLAB). The ISO accreditation programme for medical and testing laboratories which is currently carried out by the SLAB was initiated and implemented during her chairpersonship of the first Technical Advisory Committee on Medical/ Clinical Testing of SLAB.She holds many prestigious positions such as Fellow of the National Academy of Sciences of Sri Lanka and internationally in the International Science Council (ISC), the Asia Regional Chapter of the International Network for Government Science Advice and in the Economic and Social Commission for Asia and the Pacific (UN-ESCAP).

Madam President, I present to you Professor Sirimali Fernando, an exemplary scientist, researcher, academic, leader and administrator and request you to confer her with the highest honour of the College and admit her as an Honorary Fellow.

Citation read by

Professor Neluka Fernando

Senior Professor of Microbiology,

Department of Microbiology,

Faculty of Medical Sciences,

University of Sri Jayawardenepura

Fellowships of the Sri Lanka College of Microbiologists 2022

Professor Nilanthi de Silva
Senior Professor of Parasitology,
Faculty of Medicine,
University of Kelaniya

Professor Kamini Mendis
Professor Emeritus,
University of Colombo,
Independent Consultant Malariologist

Prize winners at the 30th Annual Scientific Sessions of the Sri Lanka College of Microbiologists

Following oral presentations were awarded first, second and third places at the 30th Annual Scientific Sessions of the Sri Lanka College of Microbiologists held on 25th and 26th August 2021. This was held as a fully virtual event.

1st Place

OP 7

Clinical features and epidemiology of hantavirus hemorrhagic fever with renal syndrome in Sri Lanka, March 2013 to March 2021

Muthugala MARV[1,2,3], Dheerasekara WKH[4], Manamperi AAPS[5], Gunasena S[3], Galagoda GCS[3]

[1]Department of Virology, National Hospital, Kandy, [2]Teaching Hospital Anuradhapura, [3]Medical Research Institute, Colombo, [4]Faculty of Allied Health Sciences, University of Peradeniya, [5]Faculty of Medicine, University of Kelaniya

2nd Place

OP 9

The increasing infection rate of Leishmania donovani in Phlebotomus argentipes highlights the need for Leishmaniasis control in Sri Lanka

Kumarasiri RWC K[1], Senanayaka SASC[2], Shantha DS[2], De Silva BGDNK[3], Karunaweera ND[2]

[1]Post Graduate Institute of Medicine, University of Colombo, Sri Lanka, [2]Department of Parasitology, Faculty of Medicine, University of Colombo, Sri Lanka, [3]Department of Zoology, Faculty of Applied Sciences, University of Sri Jayawardanapura

3rd Place

OP 5

Study on intra-familial transmission of Hepatitis B viral infection in a cohort of Hepatitis B virus infected patients

Paththamperuma PASR[1], Rajamanthri RGLS[2], Muthugala MARV[2].

[1]Department of Microbiology, National Hospital, Kandy, [2]Department of Virology, National Hospital, Kandy.

Following poster presentations were awarded first, second and third places at the 30th Annual Scientific Sessions of the Sri Lanka College of Microbiologists held on 26th August 2021. This was held as a fully virtual event.

1st Place

PP4

Sero-prevalence and factors associated with past exposure to hepatitis E virus infection in pregnant women attending a major maternity hospital in Sri Lanka

Akram MAFA[1], Niyas ARJP[2], Noordeen F[3]

[1]Post Graduate Institute of Medicine, Colombo,
[2]De Soysa Maternity Hospital for Women, Colombo,
[3]Department of Microbiology, Faculty of Medicine, University of Peradeniya.

2nd Place

PP2

Eczematous skin colonization pattern with potential bacterial pathogens among paediatric population at a tertiary care setting, in Sri Lanka

Karunathilake KRP[1], Vidanapathirana G[3], Weerasooriya BWMS[1],
Ekanayake EWMA[3], Dissanayake UPRU[3], Seneviwickrama KLPD[2], Herath A[2],
Liyanapathirana V[3], Kudagammana HDWS[3]

[1]Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Peradeniya, [2]Sirimavo Bandaranayake Specialized Children"s Hospital, Peradeniya, [3] Department of Microbiology, Faculty of Medicine, University of Peradeniya.

3rd Place

PP1

Distribution of Vancomycin Minimum Inhibitory Concentration and Antibiotic sensitivity pattern in *Staphylococcus aureus* clinical isolates at a university hospital Sri Lanka.

Musadik FF[1], Karunaratne HMS[2], Nakkawita WMID[2]

[1]School of Applied Sciences, University of Wolverhampton, [2]Department of paraclinical sciences, Faculty of Medicine, General Sir John Kotelawala Defence University, Ratmalana

Dr. C. Palasuntheram Prize

OP 7

Clinical features and epidemiology of hantavirus hemorrhagic fever with renal syndrome in Sri Lanka, March 2013 to March 2021

Muthugala MARV[1,2,3] Dheerasekara WKH[4], Manamperi AAPS[5], Gunasena S[3],
Galagoda GCS[3]

[1]Department of Virology, National Hospital, Kandy, [2]Teaching Hospital Anuradhapura,
[3]Medical Research Institute, Colombo, [4] Faculty of Allied Health Sciences, University of Peradeniya, [5]Faculty of Medicine, University of Kelaniya.

Presidential Address 2022

Presidential address delivered at the Induction of President and Dr. Siri Wickremesinghe Memorial Oration 2022 of the Sri Lanka College of Microbiologists on 19th March 2022

Dr. Geethika Patabendige
Consultant Clinical Microbiologist,
National Hospital of Sri Lanka, Colombo 10

The board of Directors, council members 2022, immediate past president, past presidents, members of the Sri Lanka College of Microbiologists, Mrs Rangani Wickramasinghe and the family members, and friends of Dr. Siri Wickramasinghe, Dr. Kushlani Jayatilleke, the Orator of Dr. Siri Wickramasinghe Memorial Oration 2022, Officials of the Ministry of Health, distinguished invitees, Ladies and Gentlemen.

First of all, I thank Professor Nadira Karunaweera, the immediate past president for her kind introduction. I am thankful to the membership for placing trust and confidence in me to bear this privileged title, the President of the Sri Lanka College of Microbiologists 2022. I have a great determination to serve to the best of my ability in taking the college from strength to strength adhering to principles of professionalism. I pledge to maintain high professional standards and strive to achieve the excellence in microbiology.

All are aware that the president of the college takes up this post at an induction ceremony for the benefit of the members of the college with the intention of improving the competencies of members finally aiming benefit to patients of the country with improved and better care. So, it is clear that the induction ceremony symbolizes the unity of the members of the college.

The Sri Lanka College of Microbiologists (SLCM) is an organization of professionals working in microbiology in Sri Lanka. The parent organization of SLCM was the Ceylon Association of Microbiologists which was founded in 1969 with 16 members. This name was changed to The Sri Lanka Association of Microbiologists in 1974. In 1979 the members unanimously decided that the Association should evolve into the Sri Lanka College of Microbiologists with the new constitution.

Currently, the college has a strength of 292 Life members which I consider as the most precious resource. Out of them 52 work as hospital microbiologists, 25 in other special research institutes including special campaigns, 23 in universities and 7 in private sector, 29 work as microbiologists overseas either permanently or on temporary basis undergoing compulsory postgraduate training while majority of the other members are undergoing postgraduate training locally or awaiting overseas training. The members of the college have enormous potential and each one of them has a unique capability and capacity.

Our membership includes many specialties and subspecialties namely microbiologists, virologists, mycologists, immunologists and parasitologists.

If I were to elaborate more on the objectives of SLCM laid down in the current constitution.

* To promote the advancement of Medical Microbiology and to propagate information and disseminate knowledge among its members and other groups regarding this subject by different means.

* To emphasize the importance of Medical Microbiology in Sri Lanka in relation to the control of infectious diseases and advise public and private sector on microbiology related problems that may arise in the country and to initiate appropriate action for their resolution,

* To support the representation of its members in international conferences, meetings and seminars in connection with medical microbiology,

* To promote publication of original work in medical microbiology,

* To promote research and actively assist in such research

* To promote collaboration with national and international associations with similar interest and

* To take steps as required for the attainment of the above objectives

In keeping with the above objectives our members work closely with the Ministry of Health, Sri Lanka. In addition, SLCM closely work with other organizations such as Medical Supplies Division, National Medicines Regulatory Authority, World Health Organization, Sri Lanka Accreditation Board, State Pharmaceutical Cooperation, Postgraduate Institute of Medicine and other private organizations nationally and internationally as required.

Our members conduct CMEs, workshops, training programmes and Annual Scientific Sessions, publish the Annual Bulletin of SLCM and Newsletters.

They are dedicated teachers and take part in teaching, examinations and workshops for different categories of healthcare workers for the development of disciplines in microbiology such as laboratory medicine, antimicrobial therapy and infection prevention and control. Relevant Members represent the board of study in microbiology as per the existing PGIM Ordinance and eligible trainers take part in postgraduate educational activities of microbiology and other disciplines. Our members are dedicated infection preventionists and take an active role in updating infection control activities and their implementation and also updating knowledge, skills and attitudes of infection control medical and nursing officers and other healthcare workers.

Microbiologists also serve as members of the Task Force in Microbiology and also contribute to the development of guidelines, protocols, concept papers and policy planning documents which guide the delivery of health services in Sri Lanka.

Our members act as technical experts for the Sri Lanka Accreditation Board (SLAB) for accreditation of medical laboratories. Our members also extend their services as External Evaluators for the Cosmetics, Drugs, and Devices at National Medicines Regulatory Authority (NMRA) at the Registration or at the Technical Evaluation of these items at MSD and SPC. As a professional body, we strongly consider that making the public aware is a very effective method of prevention of infectious diseases and members play a major role through in- person attendance to such activities as well as via electronic and written media whenever applicable and indicated. Research is an integral part of our work.

SLCM as a professional body partner with country and other research grants whenever our services are needed. Postgraduate course in microbiology appreciates the importance of initiating research guidance, mentoring and assisting in good quality publications.

My career as a clinical microbiologist

My services as a clinical microbiologist in different hospitals/Institutes in the country namely National Institute of Health Sciences, Kalutara, Teaching Hospital, Kurunegala as the first microbiologist followed by Colombo South Teaching Hospital for a very short period and then almost equal service periods at the Apeksha Hospital (then National Cancer Institute) and the National Hospital of Sri Lanka spans over past 20 years. Initial experience gained at Teaching Hospital, Kurunegala as the first clinical microbiologist laid a cornerstone for me to realize the role of a clinical microbiologist especially in, an out of Colombo Hospital. Working at NCI and NHSL made me realize further responsibilities a clinical microbiologist has to carry out with the already gained experience in a different set ups and community in Kurunegala which actually strengthened my capability and courage to serve the nation. In spite of the achievements, severalchallenges too were encountered which could be successfully resolved with the concerted and coordinated efforts of all stakeholders involved and the same would continue in the future as well.

With the experience I gained throughout my career as a clinical microbiologist, I'm convinced our role within the clinical governance frame work and developed a strong intention to make it a reality rather than leaving it as a blueprint. This led me with the consensus from membership to select the theme for the scientific activities of the college for my tenure as the President **“The role of clinical microbiologist within clinical governance framework: From blueprint to reality”.**

I strongly believe that it has now surpassed the threshold required for the blueprint that is a plan or a set of proposals to enter into force which would really ensure patients and the consumers receive safe and high-quality healthcare which should be the real purpose of the clinical governance framework.

As you all know clinical governance is “a system through which healthcare organizations are accountable for continuously improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence in clinical care will flourish." (Scally & Donaldson, 1998). Clinical governance is given through the integrated systems, processes, leadership and culture that are at the core of providing safe, effective, accountable and person-centred healthcare underpinned by continuous monitoring and improvement.

The key principles / components of clinical governance include

* Governance, Leadership and culture
* Patient safety and quality improvement systems
* Clinical performance and effectiveness
* Safe environment for the delivery of care
* Partnering with consumers

Seven pillars can be considered under the principles and components which are mentioned below.

* Patient and public involvement
* Staff management and performance- strategic capacity and capability
* Risk management.
* Education, training and continuous professional development.
* Clinical effectiveness and research
* Information management and communication
* Audit for further improvement

Microbiologist has to take part in adopting and implementing the above key principles or components and themes of clinical governance framework with other stakeholders such as administrative staff, other consultants, medical officers, other HCW including ancillary staff in providing high quality person - centred care which generates safe, effective, appropriate and integrated care delivered in the right way at the right time, with the right outcomes for each consumer. As a clinical microbiologist I believe that it is valuable in making all understand that everybody has a role in pursuing excellence. In order to achieve this the leader of the team has to be a role model. This enables others to realize their role in the process though it might take some time. The multidisciplinary approach, team concept, sharing the resources and caring others are some of the aspects I believe in achieving the success. In addition to improving knowledge and skills, great emphasis must be paid to improve the attitudes of the people involved triggering change in the existing system.

I would like to take a few aspects in explaining the role of a clinical microbiologist in the clinical governance frame work. Antimicrobial Resistance (AMR) and laboratory arm, Infection Prevention & Control (IPC) arm and some other aspects.

When considering the AMR and laboratory arm

AMR has already become a global threat and it can develop into a global pandemic. The increasing trend of AMR worldwide is threatening human health with high morbidity and mortality in infectious diseases. Sri Lanka is no exception, and high rates of AMR match other figures in Southeast Asia.

When I talk on AMR, I cannot forget about National Strategic Plan (NSP) for Combating Antimicrobial Resistance in Sri Lanka 2017 – 2022 which is the fruit of the combined efforts of multi-sectoral collaboration under the “one health” concept for combating AMR. The initial draft was formulated by the Sri Lanka College of Microbiologists in collaboration with the Ministry of Health following a discussion with a wider group of stakeholders namely, other professional colleges, veterinary, agriculture and fishery on the request made by the WHO in 2016 in which I could represent as one of the AMR Core Group members of the SLCM. This was in line with the global action plan. This draft document was subjected to a wider discussion with a multi –sectoral group to produce the final document, with each group completing the areas relevant to each sector. The development of the NSP provides the roadmap to combat AMR.

The NSP is developed under five key strategies which are aligned with the strategic objectives of the Global Action Plan. The five strategies are further expressed with specific objectives and with short and long term (2 year and 5 year) mile stones for implementation. As mentioned in the NSP AMR, National Advisory Committee on AMR (NAC AMR) and National Action Plan Implementation and Strengthening Team (NAPIST) were formed and relevant Terms of References (TORs) were laid down. Many discussions were held and very successful activities were carried out in combating AMR. Due to excessive work - related to COVID-19 there was unavoidable slowing down of activities related to AMR. I believe as the focal point, Ministry of Health would think about reactivation NAPIST according to Terms of References laid down which would make the process a reality according to the time frames probably in the future as it has been already planned further expansion from 2022.

Components of NSP have to be implemented in all sectors of the country irrespective of whether it is public or private for this to be effective and make it a reality.

Microbiologist has a major role to play with other stakeholders demonstrating multi -sectoral and multidisciplinary involvement, and team effort in combating AMR. As I mentioned a little while ago, some of the activities have been done, some have been commenced, others are successfully continuing but need further strengthening and some are yet to be commenced due to some unavoidable reasons. Providing a foundation of knowledge as well as taking measures to have an effective sustainable continuation of awareness will enhance acceptance among the different categories of population encompassing prescribers, dispensers as well as the general public.

Targeting different audiences under one health concept was carried out from time to time and the most recent one is during World Antimicrobial Awareness Week (WAAW) in November 2021. In addition to this awareness, the SLCM was able to organize an awareness among school children through Provincial Directors of Education island wide in which provincial microbiologists gave their valuable support exhibiting team spirit. The public attending clinics and OPDs in hospitals were made aware by microbiologists. Awareness and involvement of the public etc. through written and electronic media is considered as another effective means of disseminating the necessary messages.

To make some of the very important component in the NSP AMR a reality, it is suggested to speed up the activities such as implementing strict drug registration and regulatory policies, streamlining evaluation activities and procurement policies, formulation and implementation of antibiotic stewardship programmes with adequate funding and resources with good monitoring and evaluation system in hospitals which need very careful planning with a very good base. Components of antibiotic stewardship programmes are being done in many hospitals however, the establishment of fully functional programmes needs well planning by a central body which is a component of blue print becoming a reality. Consideration of sustainability of all activities related to combating AMR is a real need.

Commencing Outpatient antibiotic therapy (OPAT) in relevant hospitals after studying the most effective way of implementing the activity make the task useful rather than trying to commence it in each and every hospital. As antibiotics play a very important role in managing infections and are considered to be lifesaving every patient should have the opportunity to obtain quality - assured antibiotics when needed.

Ensuring quality assured antibiotics reaching the healthcare facility in a sustainable and equitable manner would enable the prescribers to follow the national antimicrobial guidelines thus enabling saving the lives of patients in sepsis. This will enable the clinical microbiologists to ensure the adherence of prescribers to national antibiotic guidelines thus minimizing the development of AMR leading to patient safety with better outcomes. In the clinical governance frame work microbiologists would appreciate theimplementation of regulatory activities as stated in the NSP AMR under strategy four that is optimization of antibiotic use thus making it a reality.

Great emphasis has already been paid on the diagnosis of AMR and surveillance at the laboratory level through organized laboratory development via the clinical governance framework. Continuous supply of essentials for the above purpose needs further strengthening. Recommencing the discussion fora which provide an excellent platform to raise the current concerns not only on laboratory aspects but also on IPC activities would lead to fruitful outcomes enabling the blueprint to become a reality with favourable outcomes which help proper distribution of services for the needy centres on a priority basis according to set policies rather than sticking to individual needs. I'm certain that relevant microbiologists will provide expert advice and guidance for such policies and processes through consensus.

Regular well organized training programmes to different stakeholders in upgrading their knowledge, skills and also attitudes to suit the current context need consideration and their sustainability with adequate funding well ahead are considered essential aspects for the sustainability of the processes.

When considering the Infection Prevention & Control (IPC) arm

Healthcare Associated Infections (HAI) are increasing locally and globally. This poses a risk to the public when assessing health services and to the healthcare workers when providing care to the patients. The rise in HAI is due to the exponential rise and spread of antimicrobial resistant pathogens. The two epidemics are intimately connected as the widespread abuse of antimicrobials is the main driver of AMR while poor IPC is the main reason for dissemination of these resistant pathogens.

Within the clinical governance frame work microbiologists would appreciate the implementation of infection prevention and control activities as stated in the NSP AMR under strategy three that is reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures making it a reality.

In a healthcare institution, a microbiologist as the technical head of the infection control unit has to take the lead as per the clinical governance framework in ensuring the safety of patients and healthcare staff by performing safe procedures / processes in safe environments during delivery of care which involves better clinical performance and effectiveness. In achieving this vital task, partnering with the consumers and other organizations like WHO would be an effective means for obtaining valuable inputs and resources in addition to the resources obtained through the ministry of health. This should be part of the relevant organizational quality improvement system which needs funds for its sustainability.

Updating the available guidelines, protocols, other material as well as making timely availability to the relevant stakeholders without big hazel would make it a continuous and regular process. SLCM has released many publications related to IPC recently and also in the past with the intension of improving practices among healthcare workers.

We as clinical microbiologists have been talking about the importance of having quality assured antiseptics, disinfectants and other items from its registration, procurement and delivery of the products to the relevant hospitals and other organizations by making use of the expertise of microbiologists. It has to be a continuous process and a breach in any component leads to unfavourable outcomes in the form of outbreaks, severe allergic reactions, desquamations of skin, causing other morbidities and even mortality. Availability of quality and time - tested products are mandatory to ascertain high compliance rates among the users with no harm to patients, healthcare staff and visitors. Breaches in the process leads to poor compliance, acceptability and tolerance thus spreading the nosocomial infections further increasing the healthcare cost. Having well performing quality assured laboratories which enable to test such antiseptics, disinfectants etc. with adequate human and other resources

Through careful planning of specialized units with a clinical microbiologist as one of the designing team members from the initial planning step is done on many occasions with the available IPC manuals and guidelines however, it needs further emphasis because at the end of the process many changes cannot be executed and not at all practicable and most of the time impossible though a large sum of the money had been spent for the task with the good intension of providing better patient care. However, IPC would not be possible and rather reverse might happen at times. Operation theatres, intensive care units, special care baby units, CSSDs and other special care units' structure and function should ensure safety and quality ofwork done in the expected protective environment ultimately leading to successful performance and effectiveness. Risk management is an integral part of this clinical governance framework where blueprint should be directed towards reality without any delay. Improvisation might have to be done considering the basic principles of IPC and not haphazardly without compromising the safety of patients and staff. This can be done through effective communication respecting team spirit. Prioritization is another very important aspect clinical microbiologists keep in mind in each and every aspect of their role and responsibility.

Well organized independent monitoring and evaluation systems have to be in place within the clinical governance framework which is a proof that it had been undertaken. Audits would help to find the possible reason thus enabling better planning the next time.

System changes, multimodal strategies, availability of resources and implementation of components which could not be implemented in the third objective of the NSP AMR is a real necessity.

Commemorating advocacy days is an effective method to make the public and staff aware of the concepts like hand hygiene, sepsis, the importance of quality etc.

Continuous Professional Development courses, attitudinal changes need consideration within the system. High - quality research studies would generate data and through appropriate information management can lead to development of guidelines etc, review and evaluation.

Other aspects

Microbiologists, virologists, mycologists, imunologists and parasitologists as the professionals giving technical advice on diagnostics, always emphasize the importance of having local validation of test kits before releasing them to hospitals and healthcare institutions. They provide their services in ensuring the quality of the products we work with to provide accurate results.

Fearless, intelligent, willing to search for new knowledge, firm in decision making, good team worker, IT literacy and knack for teaching are some of the essential qualities in carrying out the expected roles of a clinical microbiologist within clinical governance framework in making the blue print a reality".

Challenges

Nothing is without challenges. Everybody learns from mistakes. Lack of human and other resources and their maldistribution, lack of coordination between different units or departments as well as with other ministerial level institutes, poor initial infrastructure development due to low funding availability and poor maintenance of units due to multiple reasons either unavailability of required trained staff or poor funding are some of the issues. Issues related to laboratory infrastructure and equipment, antimicrobial use and infection prevention and control activities, inadequate knowledge, skills and attitudes of some personnel related to healthcare, quality and safety issues related to the health system, lack of monitoring and evaluation of systems leading to exhaustion and decline in interest of healthcare personnel are some of them.

I am certain that all stakeholders in the processes have already taken the courage and enthusiasm to fight the battle through strengthened activities which would enable us to see the reality in the majority of activities surpassing the blueprint.

As the president of the college, I am really happy to work very closely with the ministry of health and other related organizations, WHO etc. with utmost dedication and commitment in ensuring the role of the clinical microbiologist which benefits the poor patients. I am certain that all the organizations will give the SLCM their fullest cooperation in achieving this goal.

I would like to announce that the annual scientific sessions of the SLCM will be held from 24th to 26th August 2022. In addition to the annual sessions, the SLCM has already planned multiple academic and professional, cooperate and joint initiatives with other professional colleges with the participation of local and international resources through online portals as well as physically within the objectives of the college which would benefit the members, non-members, patients and the country as a whole.

Acknowledgments

I am truly grateful to the Council members and the larger membership for the support they offer in each and every activity that we undertake, Special thanks go to my honorary joint secretaries of the council Dr.Deepa Perera and Dr. Nilushi De Silva who work tirelessly with immense dedication and commitment. I would like to extend my sincere thanks to two office secretaries Priyanga and Amanda.

Whatever the distance I have travelled in my career, I cannot forget the great debt I owe to my late father and my mother who nurtured and guided me throughout life, giving me all the opportunities for me to be successful in my chosen career. Then, I would like to thank my teachers of Sujatha Vidyalaya, Matara, for molding my character and guiding me to develop capacity, capability and values in life. I am also extremely grateful to all my teachers who taught me during my undergraduate and postgraduate training periods which enabled me to strengthen my capacity, capability, tolerability and also learning ethical aspects. I am failing in my duties if I do not mention the name of Professor Vasanthi Thevanesam who molded me in different aspect during my postgraduate training and was instrumental in commencing this postgraduate course leading to clinical microbiology.

I remember with gratitude late Dr. Siri Wickramasinghe who helped me in numerous ways in completing my MD dissertation on rabies in mongooses and domestic rats in the Southern Province of Sri Lanka and still I remember how he was so happy and immediately congratulated me when I won the first prize for the best oral presentation in the 10th Annual Academic Session of SLCM in 2001.

I sincerely remember Dr. Omala Wimalaratne who was my supervisor to the MD dissertation and helped me in numerous ways to make it a great success at this moment. I would like to remember Dr. Gaya Colombage who taught me A, B, C on college activities while I was working as one of her honorary joint secretaries in 2006. A special mention must be made of my colleagues, friends, well - wishers and associates who took me this long and my sisters and family for tolerating and encouraging me immensely, being patient and supporting throughout.

Finally, I would like to thank everyone here, for sacrificing your valuable time and gracing this occasion by being with us today which enabled me to share my experience in microbiology and infection control aspects.

DR. SIRI WICKREMESINGHE MEMORIAL ORATION – 2022

To do or not to do- Infection prevention and control- Should it be evidence based?

Dr. Kushlani Jayatilleke,

MBBS (Colombo), Diploma in Medical Microbiology, MD in Medical Microbiology,
Consultant Microbiologist,
Sri Jayewardenepura General Hospital, Nugegoda, Sri Lanka
Member of the WHO Technical Steering Group, Infection Prevention and Control Global Unit, WHO HQ,
Geneva, Switzerland Member of the WHO Hand hygiene (HH) & Infection Prevention and Control Technical Advisory Group,
WHO HQ, Geneva, Switzerland Member of the Advisory Group on Critically Important Antimicrobials in Human Medicine,
WHO, Geneva, Switzerland

Dr. R. S. B. Wickremesinghe

Dr. Rakkitha Sirimal Bandara Wickremesinghe was born in 1937 to Dr Arty and Helen Wickramasinghe. He had his primary education at the Royal College, Colombo and obtained his MBBS from Faculty of Medicine, Colombo in 1963. He joined the MRI and then followed the Diploma and Master of Science in microbiology from University of Manchester and MD with board certification in microbiology from PGIM, University of Colombo. He has worked in overseas laboratories such as Addernbrooks Hospital at Cambridge and Centre for Disease Control and Prevention (CDC) linked laboratory in Michigan and the Fairfield Hospital in Melbourne.

He was a consultant microbiologist working at Medical Research Institute (MRI) and was actively participating in academic, social and sports events of MRI as well as the Sri Lanka College of Microbiologists. He was a member of the council of Sri Lanka College of Microbiologists (SLCM) for many years and was the president of the college in 1994.

He was a nature lover, and turtle conservation was one of his passions. He was a loving father and a dedicated husband and I was fortunate to be trained under him during my post graduate training. I dedicate this oration to this great man today.

Introduction and background

Importance of Infection prevention and control (IPC) was highlighted during the COVID-19 pandemic. Though IPC was considered important by the clinical microbiologists, its importance was not apparent to most people in Sri Lanka including the healthcare workers and the public, until the COVID-19 pandemic began.During the COVID-19 pandemic everyone was trying to do their best to prevent and control the spread of COVID-19 infection. Some of these activities were not evidence based and some were doing more harm than good. Unnecessary barriers were limiting the ventilation and increasing chance of disease transmission and spraying disinfectants on people, what adverse effects it can cause were not considered.

Gloves worn by sales personnel without washing the hands at all, having disinfectant mats at the entrance and some times asking to remove the shoes before walking on it without considering the harmful effects it could have on the people. Counters were covered with polythene and the hands of all customers were touching these and probably helping to transmit pathogens including COVID-19.

Lock downs; what social, psychological and economic effects they had on the community as well as on health of people in general were also not assessed.

Infection prevention and control

IPC is a **practical**, **evidence-based** approach which prevents **patients and health workers** from being harmed by **avoidable infection** and as a result of **antimicrobial resistance (1).** Infections can spread through outbreaks and many regular care practices, **affecting hundreds of millions of people across the world every year**.

Evidence based medicine

Evidence based medicine (EBM) is what is scientific and acceptable to practice. According to definition EBM represents integration of clinical expertise, patient's values and best available evidence in process of decision making related to patients' health care (2). Medical knowledge grows every day, so that previously accepted facts rapidly become old and it seems impossible to follow such explosion of scientific information.

I would like to discuss the practical difficulties in implementing EBM in infection prevention and control as well as common practices and outcomes of IPC activities in Sri Lanka.

The guidelines on Core components for IPC at the national and healthcare facility level were developed in 2016 by the World Health Organization (WHO)

These guidelines were developed following the methods outlined in the 2014 WHO Handbook for guideline development (3, 4).

The development process included six main stages:

(i) identification of the primary outcomes and formulation of the PICO (Population/Participants, Intervention, Comparator, Outcome/s) question (an approach commonly used to formulate research questions);

(ii) performing two systematic reviews for the retrieval of the evidence using a standardized methodology;

(iii) developing an inventory of national and regional IPC action plans and strategic documents;

(iv) assessment and synthesis of the evidence;

(v) formulation of recommendations and good practice statements in an expert meeting; and

(vi) writing of the guidelines and planning for the dissemination and implementation strategies.

I was a member of the Guideline Development Group (GDG) for this document.

For each intervention, the PICO question was formulated as follows:

* Population: patients of any age admitted to an acute health care facility or a specific ward or front-line health care workers

* Intervention: each of the **IPC interventions** implemented

* Comparator: regular care practices with no specific IPC intervention

* Outcome: The incidence or prevalence of Healthcare Associated Infection (HAI)s (including those caused by antimicrobial-resistant microorganisms), including other secondary outcomes such as hand hygiene compliance.

The first source of evidence was a review published by SIGHT study group the "Systematic review and evidence-based guidance on organization of hospital infection control programmes". This review was updated to include literature published up to 23 November 2015. An additional systematic review (2000- 2015) with the same objectives was performed, but with a focus on the national level. Individual studies were assessed for risk of bias by four reviewers using the Cochrane Effective Practice and Organization of Care (EPOC) risk of bias criteria. As defined by EPOC, only RCTs, non-RCTs, controlled before-after studies or interrupted time series were included in the quality assessment. Based on the systematic reviews, the Guidelines Development Group formulated recommendations using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. For some topics, good practice statements were developed instead of recommendations in the absence of methodologically sound, direct evidence on the effectiveness of interventions. Finally, research implications were also identified by the GDG.

The strength of recommendations was rated as either 'strong' when the panel was confident that the benefits of the intervention outweighed the risks or 'conditional' when the panel considered that the benefits of the intervention **probably** outweighed the risks. In the absence of methodologically sound, direct evidence on the effectiveness of interventions, the GDG decided to develop good practice statements under the guidance of the methodologist to highlight important components that were deemed essential for IPC implementation.

In summary 4 strong recommendations and 2 good practice statements were developed for the national level while 8 strong recommendations and 1 good practice statement were developed for the healthcare facility (HCF) level.

The first core component is on having an IPC programme which is a strong recommendation with very low quality of evidence for the HCF level but a Good Practice Statement for the national level. The 2nd core component is to have IPC guidelines at both national and HCF level which is a strong recommendation with very low quality of evidence. Recommendation on education and training on IPC is the next which is a strong recommendation with moderate quality of evidence for the HCF level but a GPS for the national level. HAI surveillance is a strong recommendation with very low quality of evidence for both HCF level and the national level.

Recommendation on multimodal strategies for implementing IPC activities is a strong recommendation with low quality of evidence for both HCF level and the national level. Monitoring, evaluation and feedback is a strong recommendation with low quality of evidence for HCF level and a strong recommendation with moderate quality of evidence for the national level. It is also a strong recommendation with very low quality of evidence to have satisfactory workload, staffing and bed occupancy at the HCF level. While having built environment, materials and equipment for infection prevention and control at the facility level is a good practice statement, having materials, equipment and ergonomics for appropriate hand hygiene is a strong recommendation with very low quality of evidence.

Of the eleven strong recommendations 6 were based on very low-quality evidence, 3 on low quality evidence and 2 on moderate quality evidence.

It is important to appreciate how to decide whether the evidence is strong or weak and also how difficult it is to implement RCTs and other studies related to IPC activities which will be recognized as providing high quality evidence. This highlights that good quality of evidence is hard to find for IPC activities.

Additional factors considered when formulating the recommendations were values and preferences, resource implications, feasibility and acceptability.

It is important to note that although the recommendations for the facility level focus on acute health care facilities, the core principles and practices of IPC as a countermeasure to the development of HAI are common to any facility where health care is delivered. Therefore, these guidelines should be considered with some adaptations by community, primary care and long-term care facilities as they develop and review their IPC programmes.

Furthermore, while legal, policy and regulatory contexts may vary, these guidelines are relevant to both high- and low-resource settings as the need for effective IPC programmes is universal across different cultures and contexts. Indeed, adaptation to the local context, taking into account available resources, culture and public health needs, will be important in the implementation of the guideline recommendations. There is also a particular need for careful evaluation of feasibility and cost in low-resource settings. Adoption should be facilitated by sound implementation strategies and practical tools.

Interim Practical Manual supporting national implementation of the WHO Guidelines on Core Components of Infection Prevention and Control Programmes

In the Interim Practical Manual supporting national implementation of the WHO Guidelines on Core Components of Infection Prevention and Control Programmes,

5 steps are described for implementation (5).

Step 1: Preparing for action
Step 2: Baseline assessment
Step 3: Developing and executing an action plan
Step 4: Evaluating impact
Step 5: Sustaining the programme over the long term

Minimum requirements for infection prevention and control programmes

I was also part of the expert team which developed the 'Minimum requirements for infection prevention and control programmes' which was published in 2019 by the WHO (6).

In the minimum requirement it is recommended that a functional IPC programme should be in place at national level, including at least one full-time focal point trained in IPC and a dedicated budget for implementing IPC strategies and

plans. Spacing of at least 1 metre between the edges of beds was recommended in healthcare facilities. I was in the minority against this recommendation as a minimum requirement. I mentioned this was not practical in Low and Lower Middle-Income Countries and it was only important in wards where patients with respiratory infections are cared for. Now with the COVID-19 pandemic I understand the importance of this minimum spacing though it may still be a difficult target to achieve in all HCFs.

Efficacy of hand hygiene

As I realized the scarcity of evidence on basic IPC practices, we conducted a study which evaluated the efficacy of hand hygiene when performed according to the guidelines of World Health Organization (WHO) using soap and water and alcohol-based hand sanitizers (7). This showed that some organisms such as *Staphylococcus* species were difficult to be removed from hands with the recommended methods. Experimental studies such as these will not be considered as good quality evidence for guideline development. Therefore, further well-planned studies are needed for assessing effectiveness of recommended hand hygiene methods and to recommend further improvements on hand hygiene methods.

Infection prevention and control in Sri Lankan hospitals in relation to WHO Guidelines

I was invited by the chief editor of the Sri Lankan Journal of Infectious Diseases, Prof Vasanthi Thevanesam, to write an article on 'Infection prevention and control in Sri Lankan hospitals in relation to WHO Guidelines' (8). In this I tried to critically look at the IPC related activities in Sri Lanka.

In Sri Lanka though most major healthcare institutions have well organized IPC programmes, lack of national level IPC programme with proper monitoring system was noted. The training of nurses on IPC is carried out in Colombo annually by the Ministry of Health. However, in most Sri Lankan hospitals, not even the minimum ratio of one infection preventionist per 250 beds is maintained. IPC units in hospitals are headed by the Consultant Microbiologists, when they are available. A key drawback in Sri Lanka is the inadequacy of microbiologists as all hospitals do not have the required specialist services and with the exception of the National Hospital of Sri Lanka, each hospital has only one Consultant Microbiologist though the bed strength of several are greater than 1000. Only a few IPC units have medical officers who are trained in IPC. Good quality microbiological laboratory support is a very critical factor for an effective IPC programme. Currently, none of the microbiology laboratories in state hospitals have accreditation with the Sri Lanka Accreditation Board, though some are working towards accreditation. In most of the public sector hospitals the bed occupancy exceeds 100% thus making it essential for patients to share the beds. This violates fundamental principles of IPC. Healthcare worker staffing levels too are grossly inadequate.

Challenges in Implementing Surveillance Tools of High-Income Countries (HICs) in Low Middle-Income Countries (LMICs)

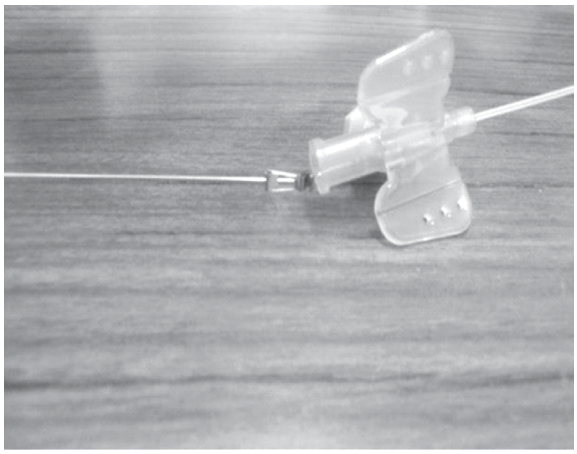
I was able to publish this article on 'Challenges in Implementing Surveillance Tools of High-Income Countries (HICs) in Low Middle-Income Countries (LMICs)' in Current Treatment Options in Infectious Diseases (9).

Disease surveillance as well as AMR surveillance is important for IPC as well as for detection and control of outbreaks. Fast reporting and proper network of communicating data is crucial. Proper tools should be in place for data communication using information technology for all participants. Most of the surveillance tools implemented in surveillance of communicable diseases in the community in HICs can be used in LMICs as done in Africa.

Major setback for implementing HAI surveillance in LMICs is not having adequate number of trained staff and a national programme for infection prevention and control in healthcare setting, who should carry out the national surveillance and feedback. Manual method of data collection is not suitable with the high workload of the staff which makes data collection, especially the denominator data for calculating HAI rates, impractical. Limited laboratory facilities also make the HAI surveillance incomplete and a major challenge faced in antimicrobial resistance surveillance in LMICs. Not having facilities for identification of pathogens to species level and for performing reliable methods of minimum inhibitory concentrations and not having accredited laboratories, is a common problem in laboratories of LMICs. Not having well planned Laboratory Information Management Systems which will export AMR data to a software such as WHONET which can be used to create summary reports and alerts of importance routinely is another limitation in LMICs.

Effectiveness of safety cannula in reducing needlestick injuries

In Sri Jayewardenepura General Hospital (SJGH) needle stick injuries (NSI) were a major problem. During analysis of these events, it was noted that cannula stylets were a major hazard to healthcare workers as well as patients. Though safety devices are recommended by institutions such as Centre for Disease Control (CDC) and National Institute for Occupational Safety and Health (NIOSH) in USA, in Sri Lanka administrators are reluctant to introduce such devices due to the higher price of these devices. In 2016, the administration of SJGH decided to utilize safety cannulas in addition to the conventional cannulas on trial basis based on the recommendation of the consultant microbiologist.



'Effectiveness of safety cannula in reducing needlestick injuries' were analysed and published (10).

The total number of conventional and safety cannulae utilized during the study period was 86,412 and 284,686 respectively. In total, there were 12 NSIs associated with conventional cannula insertion and 5 NSIs associated with safety cannula insertion. The annual NSI incidence per 100,000 devices for conventional and safety cannulae was 13.89 and 1.76 respectively. There was no difference in the clinical experience between the two subgroups.

Reduction of needle stick injuries with the safety device was 12.13/ 100,000 devices per year with the incidence rate ratio of 0.1265.

There was a significant reduction of NSI incidence with the use of safety cannulae giving a p value of < 0.0001.

The cost per device inclusive of management of associated NSIs for conventional and safety cannulae was Lankan Rupee 73.18 and 83.17 respectively.

Safety devices have substantially reduced the incidence of needle stick injuries and we highly recommend the implementation of safety cannulae use to prevent occupation-related health hazards and to improve health care safety.

The effect of two high level disinfectants

Nosocomial pathogens can be transmitted through contaminated instruments and surfaces. Disinfectants play a crucial role in preventing HAIs. High-level disinfection is defined as complete elimination of all microorganisms in or on an instrument, except for small numbers of bacterial spores, to prevent transmission of infection.

A study was caried out to evaluate the effect of two high level disinfectants designated 'disinfectant 1' which contains primarily peracetic acid and 'disinfectant 2' which contains primarily dodecyl dimethyl ammonium chloride (11).

This experimental study was conducted for disinfectant 1 and 2 according to the quantitative carrier test (European Standard EN 14561:2006). Disinfectants were tested at three different concentrations on glass, stainless steel and Rexene surfaces against the commonest three bacteria responsible for causing HAIs in SJGH. Coliforms, *Acinetobacter* species and *Staphylococcus aureus* were the three most common bacteria responsible for causing HAIs in SGJH.

Both high level disinfectants achieved a Microbicidal Effect (ME) value of 5 as per 'clean disinfectants' in manufacturer recommended dilutions and passed the test against *Escherichia coli*, *Acinetobacter* spp. and *S. aureus* under both clean and dirty condition on all three tested surfaces. However, bacterial colonies of all 3 test organisms were detected after both disinfectant 1 and 2 use. Effect of disinfectant 1 was poor in manufacturer recommended concentrations on glass, stainless steel and Rexine surfaces. ME of disinfectant 2 was considerably higher when compared to disinfectant 1.

In conclusion effect of commonly used selected high-level disinfectants were inadequate, as common HAI causing bacteria were present on different surfaces after high level disinfectant use according to guidelines. In this hospital, these disinfectants are used for equipment such as laparoscopes, gastroscopes, endotracheal tubes and other endoscopes, which are used in direct contact with a break in skin or mucus membrane or enter a sterile body area. Having residual bacteria after disinfection is therefore not acceptable. More studies should be performed on this subject to evaluate the claims of manufacturers.

IPC related to COVID-19

During the COVID-19 pandemic recommendations for personal protective equipment (PPE) for HCWs who care for suspected or diagnosed patient with COVID-19 was diverse. WHO amended the guidelines on IPC measures including mask use several times during the pandemic after considering the available evidence and other factors. Global IPC unit of WHO reviewed available data on COVID-19 transmission regularly, working closely with other organizations such as Center for Disease Control, USA and UNICEF (12, 13,14, 15, 16, 17, 18).

Again, I was able to work as a member of the GDG of WHO for developing the guidelines for IPC related to COVID-19. WHO organized regular online meetings with the group of experts on IPC from all over the world the Guideline Development Group-GDG and other relevant representatives to discuss available data on COVID-19 transmission and to update the guidelines. Researches working on different aspects of COVID-19 transmission and on effectiveness of PPE presented their findings to the GDG of WHO. Bydoing this the guidelines on IPC in COVID-19 were regularly updated. When developing these guidelines in addition to the quality of evidence the practicality, feasibility, acceptability and equity were also considered. The effect of variants of concern on transmission was also an important area which was considered as and when it appeared. Most healthcare workers (HCW) in Sri Lanka wanted “full PPE” as in China which they saw on television though the WHO recommended medical or surgical mask when caring for suspected COVID-19 patients. This meant full body kit which is water proof, with respirator, head cover and boots.

During the early phase of the pandemic in 2020, before the first patient was diagnosed in Sri Lanka, HCWs were wearing respirators (N95 masks).

The demand for PPE especially N95 masks were very high globally and availability was limited. Elastomeric respirators (ER) were introduced to Sri Lankan hospitals at this point as a solution.

The reuse of these were recommended after reprocessing but the guidelines for cleaning and disinfection were variable and difficult to implement. At SJGH, ER was introduced as other respirators were not available in adequate numbers.

The experience of health care workers on use of disposable N95 masks and reusable elastomeric respirators

A study was carried out in which the objective was to assess the experience of health care workers on use of disposable N95 masks and reusable elastomeric respirators (19). A self-administered questionnaire was given to HCWs at SJGH who used these masks during June 2020.

The 46 participants comprised mainly of nurses. Most HCWs believed that N95 masks were required for non-aerosol generating procedures. Adverse events were reported by all who used ER compared to 66% of HCWs who used disposable N95 masks ($p<0.01$). HCWs who used disposable N95 masks for a longer duration had experienced more adverse events ($p<0.05$).

In conclusion disposable N95 masks should be conserved for settings where aerosol generating procedures are performed, due to shortage and adverse events. Use of disposable N95 masks should be limited to shorter durations to minimize discomfort. This highlights the importance of considering availability, equity and adverse effects, when guidelines are developed and how important it is to follow the guidelines.

Use of PPE and COVID-19 transmission during healthcare in SJGH during COVID-19 pandemic

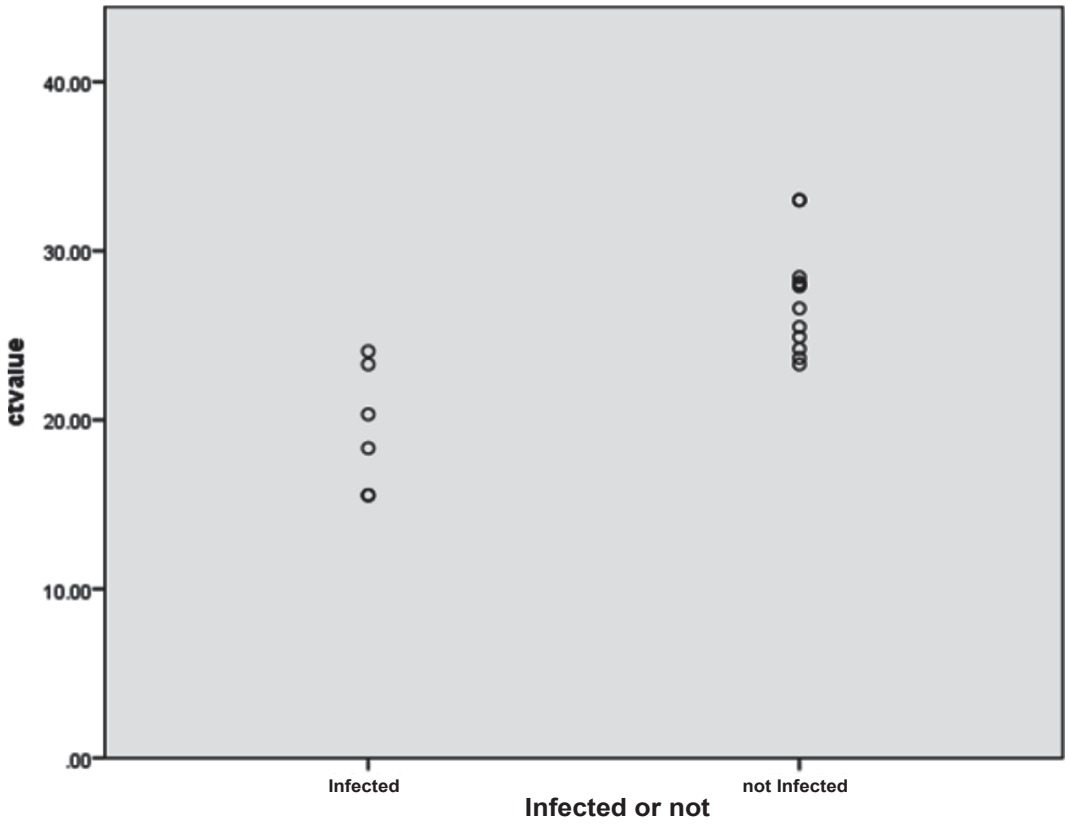
Use of PPE during healthcare in SJGH during COVID-19 pandemic was variable between HCWs in spite of having guidelines prepared based on WHO guidelines. A retrospective descriptive study was carried out on PPE use and COVID-19 transmission in the hospital (20).

Data collected during routine risk assessment was analyzed using SPSS_26 software.

A total of 108 COVID-19 positive patients were diagnosed in the hospital of which 17 were HCWs. Of the 108, 29 were asymptomatic. Aerosol generating procedures were performed in 10 events. Fifty-three HCWs were quarantined for 14 days following exposure but only 4 developed the disease. Of the total 946 events, 945 had HCWs exposed within 1 meter to COVID-19 positive patients while one event had exposure to the equipment used on a patient.

Out of the 945 events within 1-meter distance, attending HCWs wore respirators only during 47% of the events. The source patient wore a mask only around 76% of the events. In 98 events, exposure was for more than 15 minutes.

The Cycle threshold of the source patient's PCR was between 15.54 to 24.06 or Rapid Antigen Test positive when the HCWs acquired the infection while it was ranging from 23.28 to 33 when the contacts did not develop the disease.



Not having a mask on source, >15 minutes exposure within 1m and not having a face shield in addition to a mask had significant association with COVID-19 transmission.

In conclusion

* Wearing a mask is useful for source control and therefore should be encouraged as much as possible

* Wearing a mask may not be practical, especially if the patient has symptoms of COVID-19, limiting the usefulness of the mask for source control in the healthcare setting

* Acquiring COVID-19 infection in hospital setting was not common in spite of not using respirators during all healthcare encounters

* HCWs acquired infection when the source patients had Ct values of less than 25 in the PCR or were RAT positive

* More than 15 minutes of exposure, performing an aerosol generating procedure and not having a mask on the source patient were significantly associated with acquiring COVID-19 infection

* Wearing the face-shield in addition to a mask was significantly associated with not acquiring COVID-19 in exposed HCWs.

We also carried out a case control study which was presented at 13th International Symposium of Antimicrobial Agents & Resistance (ISAAR) 2021 (21).

• A **case** was defined as either a PCR or rapid antigen test for SARS-Cov-2 virus positive in a HCW, with no known exposure to the disease in the community but had a significant exposure in the health care setting within the 14 day period before the onset

* A **control** was a HCW who had the exposure to the same source patient, but not positive with COVID19 within 14 days of exposure.

* The data collected at risk assessment of 18 cases and 72 controls were analyzed using SPSS_26 software.

Conclusions:

* **Being within 1m distance from the source was a statistically significant risk factor (P=0.019)**

* **Three times higher risk was observed when exposure time was >15minutes and when the source was not wearing the mask.**

* **Among HCWs who were at <1 m distance the percentage of not having any PPE among cases and controls were 47.1% vs 54.2%**

* **Doctors were significantly at a lower risk of getting the infection than other categories of health care workers (P=0.025).**

With this oration I wished to highlight the following points:

* Importance of considering evidence as well as other important factors such as values and preferences, resource implications, feasibility, acceptability and equity when developing IPC guidelines.

* It also highlights the importance of following the guidelines developed by experts.

* IPC experts should carry out properly designed research on IPC activities to guide the practices.

* Considering qualitative studies, implementation research and descriptive studies when developing IPC guidelines along with the expert opinion is recommended

* Many limitations are present in Sri Lanka for IPC activities.

* Support of the administrators is necessary to establish a proper National IPC programme and IPC programmes at healthcare facility level at all healthcare institutions with adequate resources.

I wish to thank all co-authors of these papers, the directors and administrators of SJGH, PG trainees, IPC nurses and all others who supported me in carrying out IPC work and this research at SJGH. My good friend Dr Nalika Gunawardena who always help me with my statistics. The team with whom I have worked in WHO for many years. I also wish to thank all the directors, IPC staff and other staff of all the hospitals where I worked. I wish to thank all those with whom I have worked on IPC at national level.

Big thank you to my parents and my family who supported me throughout. I thank all the teachers of Samudradevi Balika Vidyalaya, Nugegoda and Visakha Vidyalaya, Colombo and the Faculty of Medicine, Colombo; and my post graduate trainers especially Prof Lalitha Mendis, Prof Jenniffer Perera, Dr S D Athukorala, Prof Vasanthi Thevanesam and Dr Palasundaram and the trainers and the IPC teams of the Lancashire Teaching Hospitals and Leeds teaching Hospitals NHS trusts, UK.

References:

1. Infection prevention and control; World Health Organization; https://www.who.int/teams/integrated-health-services/infection-prevention-control

2. Evidence Based Medicine – New Approaches and Challenges; doi: 10.5455/aim.2008.16.219-225 Received: 10 August 2008 Accepted: 22 September 2008

3. Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level, 1 November 2016; https://www.who.int/publications/i/item/9789241549929

4. Storr J, Twyman A, Zingg W, Damani N, Kilpatrick C, Reilly J, et al. Core components for effective infection prevention and control programmes: new WHO evidence-based recommendations. Antimicrob Resist Infect Control [Internet]. 2017;6(1). Available from: http://dx.doi.org/10.1186/s13756-016-0149-9

5. Interim practical manual supporting national implementation of the WHO Guidelines on Core Components of Infection Prevention and Control Programmes; WHO/HIS/SDS/2017.8; World Health Organization 2017

linimum requirements for infection prevention and control programmes; ISBN 978-92-4-151694- 5; World Health Organization 2019; https://www.who.int/publications/i/item/9789241516945

7. P. A. S. R Paththamperuma, M. A. N Manchanayaka, P. C. L. S Buddhadasa, Dushyantha Wariyapola, Kushlani Jayatilleke; Qualitative study on efficacy of hand hygiene with water, soap and water and alcohol-based hand sanitizers; 36th Annual Scientific Sessions, Sri Jayewardenepura General Hospital Clinical Society; December 2021

8. Jayatilleke, K., 2017. Infection prevention and control in Sri Lankan hospitals in relation to WHO Guidelines. Sri Lankan Journal of Infectious Diseases, 7(1), pp.2–9. DOI https://sljid.sljol.info/articles/abstract/10.4038/sljid.v7i1.8131/

9. Challenges in Implementing Surveillance Tools of High-Income Countries (HICs) in Low Middle Income Countries (LMICs); https://link.springer.com/content/pdf/10.1007/s40506-020-00229-2.pdf

10. Effectiveness of safety cannula in reducing needle stick injuries KT Abeywardana, WABN Wijesinghe, GK Iresha, PCLS Buddhadasa, SK Jayatilleke; Sri Lankan Journal of Infectious Diseases 2020 Vol.10 (1):65-71 DOI: https://sljid.sljol.info/articles/abstract/10.4038/sljid.v10i1.8272/

11. Boteju, G., Weerasinghe, G., Gunasekara, H., Jayatilleke, S., Widanagamage, R. and Karunarathna, W., 2020. Effectiveness of commonly used high level disinfectants on bacteria responsible for hospital acquired infections in Sri Jayewardenepura General Hospital, Sri Lanka. Sri Lankan Journal of Infectious Diseases, 10(1), pp.38–47. DOI: http://doi.org/10.4038/sljid.v10i1.8257

12. Infection prevention and control during health care when coronavirus disease (COVID-19) is suspected or confirmedInterimguidance;29June 2020; https://apps.who.int/iris/bitstream/handle/10665/332879/WHO-2019-nCoV-IPC-2020.4-eng.pdf?sequence=1&isAllowed=y

13. Advice on the use of masks for children in the community in the context of COVID-19 Annex to the Advice on the use of masks in the context of COVID-19Difficulties encountered by health care workers with the use of N95 disposable masks and Elastomeric respirators during COVID 19 pandemic; 21 August 2020; https://apps.who.int/iris/bitstream/handle/10665/333919/WHO-2019- nCoV-IPC_Masks-Children-2020.1-eng.pdf?sequence=1&isAllowed=y

14. Mask use in the context of COVID-19 Interim guidance 1 December 2020; https://apps.who.int/iris/bitstream/handle/10665/337199/WHO-2019-nCov-IPC_Masks-2020.5-eng.pdf?sequence=1&isAllowedy

15. Rational use of personal protective equipment for COVID-19 and considerations during severe shortages: interim guidance, 23 December 2020; World Health Organization; https://www.who.int/publications/i/item/rational-use-of-personal-protective-equipment-for-coronavirus-disease-(covid-19)-and-considerations-during-severe-shortages

16. WHO. Mask use in the context of COVID-19. World Heal Organ [Internet]. 2020;(December):1–10. Available from: https://www.who.int/publications/i/item/advice-on-the-use-of-masks-in-the- community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus- (2019-ncov)-outbreak

17. Infection prevention and control during healthcare when coronavirus disease (COVID-19) is suspected or confirmed, Interim guidance 12 January 2021; https://www.who.int/publications/i/item/WHO-2019-nCoV-IPC-2021.1

18. WHO recommendations on mask use by health workers, in light of the Omicron variant of concern; interim guidance, 22 December 2021; World Health Organization; https://www.who.int/publications/i/item/WHO-2019-nCoV-IPC_Masks-Health_Workers- Omicron_variant-2021.1

19. Waniganayake, Y.C., Nadeeshani, H.K.D.K., Buddhadasa, P.S.L.S., Iresha., G.K. and Jayatilleke, S.K., 2021. Difficulties encountered by health care workers with the use of N95 disposable masks and Elastomeric respirators during COVID 19 pandemic. Sri Lankan Journal of Infectious Diseases, 11(1), pp.18–22. DOI: http://doi.org/10.4038/sljid.v11i1.8344

20. Use of personal protective equipment and hospital acquired infection by healthcare workers who were at risk of exposure to COVID-19 infection at a tertiary care hospital in a lower middle-income country; Jayatilleke S. K., Mendis D. M., Perera T. P. W., Manoj S. S., Iresha G. K., Buddhadasa P. C. L. S., Hansani H. C. L; accepted for publication by Sri Lankan Journal of Infectious Diseases

21. D.M. Mendis, T.P.W. Perera, G.K. Iresha, P.C.L.S. Buddhadasa, H.C.L Hansani, Kushlani Jayatilleke; Assessing risk factors for health care associated transmission of SARS- Cov- 2 virus infection among health care personnel in a tertiary care hospital, Sri Lanka; a case control study; International symposium on antimicrobial Agents and Resistance (ISAAR 2021); Virtual Congress; https://www.sciencedirect.com/journal/international-journal-of-antimicrobial-agents/vol/58/suppl/S1

Reactogenicity and Immunogenicity of COVID-19 Vaccination in Health Care Workers of Medical Research Institute in Sri Lanka

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Abstract

Vaccination is currently considered the most successful strategy for combating the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). These vaccines have been shown to be extremely safe. Nevertheless, transient side effects lasting for few days have been reported.

This study is carried out to describe the reactogenicity of ChAdOx1 nCoV-19 (Covishield) vaccine and immunogenicity in 147 health care workers (HCW)s who received routine heterologous COVID-19 booster vaccination at Medical Research Institute (MRI).

Reactogenicity was assessed after the first and second dose of ChAdOx1 nCoV-19 vaccination using self- administered questionnaire. Blood samples were collected pre vaccination, three months after first dose and one month after booster dose to evaluate immunogenicity of COVID-19 vaccines.

Minor to moderate adverse events have been experienced by 97.3 % of the study population following first dose of ChAdOx1 nCoV-19 which was markedly reduced to 17.6% following the second dose. Most of the adverse effects were experienced by HCWs of age less than 40 years.

Pain (86%) and swelling (83.2%) were the most commonly reported local side effects. Myalgia, fever, headache are the commonest systemic adverse events experienced by HCWs with a frequency of 76.2%, 72.7%, 72% respectively. No potentially life-threatening reactions were reported following vaccination in this study. Among the study participants 97.8% were naïve to COVID-19 infection prior to vaccination. Of them 78.5% seroconverted with the first dose and 100% seroconverted with primary schedule with or without the booster. Only 13.6% of participants developed subsequent COVID-19 infection and the symptoms were mild in all. Therefore, it is likely that vaccination minimizes severe disease and death, although the transmission is not curtailed.

Introduction

Safe and effective vaccines are an important tool, in combination with other infection control measures for COVID-19 that save lives and reduce wide scale socio-economic disruption.

WHO recommends that initial vaccination should prioritize groups at highest risk for COVID-19 in each country, including health care workers (HCW), older persons and people with co-morbidities. Once the priority groups are vaccinated, countries should vaccinate the general population (1).

COVID vaccination programme was started in Sri Lanka on 29th January 2021 by vaccinating HCW Island wide (2). Majority of HCW received a primary course of vaccination of two doses of ChAdOx1 nCoV-19 vaccine with a gap of 12 weeks and a booster dose of BNT162b2 (Pfizer) vaccine six months after the second dose. Vaccination is considered as the most effective tool of combating COVID-19 pandemic and development of safe and effective vaccines was a dire need. The quality, safety and efficacy of COVID-19 vaccines were ensured by clinical trials and manufacturing quality control procedures. To meet this requirement, manufacturers were compelled to overlap various stages of clinical trials while maintaining safety standards (3). Matters pertaining to the quality control and evaluation of safety and efficacies of these new vaccines from different platforms posed numerous challenges.

Hence, national and international authorities were requested continuous follow-up of safety of these vaccines. This study was performed to determine the safety and immunogenicity of COVID-19 vaccination in a cohort of health care workers of MRI in Sri Lanka.

Methodology

This is a prospective observational study done in MRI, including 147 HCW aged between 18 - 61 yrs. HCWs who are immunosuppressed or received a different type of COVID-19 vaccine as their primary schedule and incomplete vaccination were excluded.

Informed written consent was obtained from participants prior to commencement of the study and self- administered questionnaire was used to collect data. Reactogenicity data was collected one week after each dose of ChAdOx1 nCoV-19 vaccine. Severity of the symptoms were assessed as mild (does not interfere with daily activities), moderate (interferes with daily activities), and severe (daily activities no longer feasible). Additionally, the use of antipyretic medication (nonsteroidal anti-inflammatory drugs or paracetamol) before and after vaccination was recorded. After the initial assessment, all participants were asked to self-report any late local or systemic symptom if appeared.

Prior to vaccination, 3 mL of blood samples were collected from study participants to assess the baseline antibody levels.

All participants were administered 0.5mL of ChAdOx1 nCoV-19 vaccine intra muscularly (IM) over deltoid region. A second sample of blood was collected 3 months after the first dose of ChAdOx1 nCoV-19 vaccine prior to administration of the second dose. Six months after completion of primary course of COVID-19 vaccination, booster dose of Pfizer vaccine 0.3mL was given IM. A third sample of blood was collected one month following booster dose.

era were separated after collection and stored at -70^{0}C until SARS-CoV-2 antibody test was performed. Commercially validated SARS-CoV-2 (S1-RBD) specific ELISA test kit (EUROIMMUN) was used to quantify total SARS-CoV-2 specific antibodies (IgG and IgM). The manufacturer's recommendation was used to quantify specific antibody levels and the given cut off value was 1.1All participants were followed up for symptoms suggestive of COVID-19 infection and were confirmed by PCR or antigen test to identify breakthrough infections.

Results

A total of 147 health care workers were included in the study. Majority of the participants (69.3%, n=102) were females. The age distribution of the study population ranged from 23 to 61 years, with a median of 39.8 years. Of the 147 study participants 83 were below 40 years and 64 were above 40 years.

Local and/or systemic adverse events have been experienced by 97.3 % (143) of the study participants following the first dose of the ChAdOx1 nCoV-19 vaccination and only by 17.6% (26) following the second dose. Majority of the study population developed adverse events between six to twelve hours of vaccination following both first (45.5%, 65/143) and second (42.3%, 11/26) dose.

Following the first dose in most cases, adverse events lasted for one to three days (48.9%, 70/143) whereas it was less than one day following the second dose (56.5 %, 13/26). Among the symptomatic participants, 72% following the first dose and 46.2% following second dose had to take medication to relieve symptoms.

Among the below 40 group (n=83) 55% and over 40 group (n=64) 17% had moderate to severe symptoms. Local and systemic side effects were analysed in the study group following both doses of vaccine (Table 1 & Table 2).

Table 1: Local adverse events

Local adverse events	First dose of vaccination Out of 143	Second dose of vaccination Out of 26
Pain at the site of vaccination		
Mild	57 (39.6%)	10 (38.4%)
Moderate	51 (35.6%)	5 (19.2%)
Severe	15 (10.4 %)	1 (3.8%)
Total	123 (86%)	16 (61.5%)
Redness at the site ofvaccinati on	16 (10.5 %)	1 (3.8%)
Swelling at the site of vaccination	119 (83.2%)	1 (3.8%)
Rash at the site of vaccination	6 (4.19%)	0

Table 2: Systemic adverse events

Systemic adverse events	First dose of vaccination Out of 143 symptomatic participants	Second dose ofvaccination Out of 26 symptomatic participants
Headache		
Mild	40 (27.9%)	7 (26.9%)
Moderate	39 (27.3 %)	6 (23%)
Severe	24 (16.8 %)	3 (11.5%)
Total	103 (72.0%)	16 (61.5%)
Fever	104 (72.7%)	9 (34.6%)
Chills	75 (52.4%)	5 (19.2%)
Myalgia	109 (76.2%)	9 (34.6%)
Generalized rash	2 (1.3%)	0
Shortness of breath	7 (4.9%)	1 (3.8%)
Abdominal pain	7 (4.9%)	0
Abdominal discomfort	12 (8.4%)	0
Diarrhoea	8 (5.6%)	0
Nausea / vomiting	23 (16%)	4 (15.4%)
Dizziness	18 (12.6%)	0
Lymphadenopathy	6 (4.2%)	1(3.8%)

SARS-CoV-2 antibody level was assessed in the study population at pre vaccination, three months after first dose and 10 months after first dose of vaccination (table 3).

Table 3: Antibody status prior to and after COVID-19 vaccination

Antibody level (Ratio)	Antibody status prior to COVID-19 vaccination	Antibody level 3 months after first dose of COVID-19 vaccination (Prior to the second dose)	Antibody levels 10 months after the first dose (one month after the booster)
Less than 1.1	91 (97.8%)	110 (78.5%)	117 (100%)
Equal or greaterthan 1.1	2 (2.1%)	30 (21.5%)	0
Total participants	93	140	117

$$\text{Ratio} = \frac{\text{Extinction of the control or patient sample}}{\text{Extinction of calibrator}}$$

During the follow up, 140 had given blood samples prior to the second dose of vaccine. From them 78.5% (110) achieved antibody level more than the cut off indicating seroconversion. The detected antibody titre varied from 1.12 to 6.9 (GMT=2.77). Antibody titres were tested ten months after the initiation of the study showed 100% sero conversion with titres varying from 4.31 to 15.9 (GMT=8.28).

Eleven participants who have only taken two doses of vaccine, showed antibody titres varying between 1.24 to 6.27 (GMT=2.78) ten months after the first dose.

During the study period breakthrough infections were observed in 20 participants out of 147. Hence the infection rate of vaccinated group was 13.6%. Out of this 20 breakthrough infections 8 were following primary course and 12 were after the booster dose (table 4). All infections were mild to moderate without requirement for hospital admission.

Out of the 147 HCWs studied in this group, 30 (20.4%) have not taken the booster dose. The infection rate was noted to be significantly higher in this group (26.6%).

Table 4: Breakthrough infections

No of vaccine doses taken	Number vaccinated	No of breakthrough infections
Only two doses of vaccine	30	8 (26.6%)
Two doses of vaccine & booster	117	12 (10.2%)
Total	47	20 (13.6%)

Discussion

Mild and moderate adverse events were mainly noted following the first dose of vaccine in the younger participants of this study. Serious adverse events including anaphylaxis were not reported. Similarly a phase 2/3 trial carried out in UK has shown the vaccine is better tolerated in older adults than younger adults (4).

Local adverse events were experienced in higher frequency than the systemic events following the first dose of vaccination, whereas both local and systemic adverse events were experienced in same frequency by a fewer number of participants following the second dose of vaccination.

Pain at the site of vaccination was observed as the commonest local adverse event following both doses of the vaccine. Moreover, myalgia was detected as the commonest systemic adverse event following the first dose of vaccination followed by fever and headache whereas headache was the commonest event following the second dose of vaccination followed by fever and myalgia.

Similar findings have been documented in studies carried out globally where pain at injection site, fatigue and headache have appeared as common side effects after ChAdOx1 nCoV-19 vaccination.

As per WHO, side effects of COVID-19 vaccines are mild to moderate, mostly reported as pain at the injection site, fever, fatigue, headache, muscle pain, chills and diarrhea lasting no longer than few days (5). A study done in UK showed systemic side effects were common in women than in men, in people aged 55 years or younger than in older age and after the first dose than after the second dose. Systemic adverse reactions had a median onset of 1–2 days after vaccine receipt and resolved in a median of 1 day (6).

Of the total study participants, 93 had given pre-vaccination blood samples for testing. Of them, 2.2% had an antibody level more than the cut-off indicating previous infection or exposure. Other 97.8% were non- immune prior to the vaccination. However, the baseline seropositivity among the HCWs was found to be 28% in a similar study done in India (7).

In our study, 78.5% seroconverted with the first dose and 100% seroconverted with primary schedule with or without the booster. A study done in Saudi Arabia has shown similar results with 83.3% of the participants developing a humoral immune response after receiving the first dose of ChAdOx1 nCoV-19 vaccine whereas it was 98.9% after the second dose (8). Therefore, a second dose was necessary to achieve a higher seroconversion.

However, the study from India revealed a high rate of seroconversion (97.1%) after the first dose of ChAdOx1 nCoV-19 vaccine probably due to prior exposure to the virus (7).

COVID-19 vaccine breakthrough infections have been reported among participants (13.6%) in this study was significantly higher compared to Indian study (3.3%). However, symptoms were However, symptoms were milder, and all recovered with home isolation in both studies. This implies that COVID-19 vaccination protects from severe disease but not 100% effective in preventing infection or transmission.

This study has several limitations. As there was no placebo group reactogenicity may have been influenced by the expectation of symptoms in some participants. Additionally, the sample size is too small to address rare adverse events, such as thromboembolic phenomenon or myocarditis. Testing of neutralizing antibodies would be more precise to measure immunogenicity this was not possible due to financialconstraints. Vaccinated asymptomatic infections were not included in the infection rate. The significance of breakthrough infections would have been better reflected if there was a control group.

Conclusions

Almost all of HCWs were naive for SARS-CoV-2 virus, confirming that the routine HCWs vaccination programme in Sri Lanka was started on time.

This study highlights the importance of obtaining the primary series and the booster dose of COVID-19 vaccines for the maintenance of immunity and protection against severe disease.

In conclusion, our study provides important real-world evidence for the safety and immunogenicity of two main COVID-19 vaccines used in Sri Lanka.

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References

1. Outbreaks and emergencies: Coronavirus (COVID 19) outbreak, COVID 19 vaccines; *WHO*

2. Guidelines for CHADOX1 NCOV-19 Covid-19 Vaccination Campaign 2021: Priority category vaccination for prevention of community transmission and mortality; Ministry of Health-Sri Lanka Qunying Mao,

3. Miao Xu, Qian He et al. COVID-19 vaccines: progress and understanding on quality control and evaluation. *Nature* 2021; **6:**199
Maheshi N Ramasamy

4. , Angela M Minassian , Katie J Ewer et al. Safety and immunogenicity of ChAdOx1 nCoV-19 vaccine administered in a prime-boost regimen in young and old adults (COV002): a single-blind, randomised, controlled, phase 2/3 trial. *Lancet* 2021; **396** (10267):1979-1993.

5. Coronavirus disease (COVID-19): Vaccines safety: Side Effects of COVID-19 Vaccines; *WHO: 31* March 2021

6. Cristina Menni, Kerstin Klaser,Anna May et al.Vaccine side-effects and SARS-CoV-2 infection after vaccination in users of the COVID Symptom Study app in the UK: a prospective observational study. *The lancet* 2021; 21:939-950.

7. Leimapokpam Sumitra Devi, Moumita Sardar, Mukesh Sharma et al. Impact of ChAdOx1 nCoV-19 Vaccination: How long will it persist? *International Journal of Microbiology* 2022; Article ID 4729844.

8. Waleed Mahallawi & Walaa Abdullah Mumena. Reactogenicity and Immunogenicity of the Pfizer and AstraZeneca COVID-19 Vaccines. Vaccines & Molecular therapeutics. *Frontiers in immunology* 2021; **12:1**-9.

Aflatoxin – Mini review

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Abstract

Aflatoxins are a group of potent toxins produced by *Aspergillus* species. Most of them are chemically stable and survive in food processing leading to adverse health effects in humans and livestock. Acute toxicity and impairment of long-term physical and cognitive development in humans due to aflatoxins are reported. Detection of aflatoxin in food is challenging and the required facility is not widely available indeveloping countries. Therefore, preventive measures should be followed to minimize aflatoxin contamination and thereby to assure food safety.

Introduction

Mycotoxins are natural poisonous compounds produced by fungi and they are toxic to humans and other vertebrates even at low concentrations(1,2).

However, all the toxins produced by fungi are not included within this term “mycotoxin”. For example, ethanol and other low molecular weight metabolites of fungi which are toxic only in high concentrations are not identified as mycotoxins. Fungal products toxic to plants are named as phytotoxins and those toxic to bacteria are usually considered as antibiotics (eg: penicillin). Toxic metabolites of macroscopic fungi and mushrooms are identified as mushroom poison(2).

Globally, about 450 mycotoxins have been identified(3). Aflatoxins, patulin, ochratoxin A, zearalenone, fumonisins, and nivalenol / deoxynivalenol are the commonly encountered mycotoxins and aflatoxin is among the most toxic out of them(4).

What are aflatoxins?

Aspergillus flavus, *Aspergillus parasiticus* and *Aspergillus nomius* produce a group of structurally related toxic metabolites called aflatoxins(5). These moulds are typically found in soil, decaying and dead vegetation. There are about 20 aflatoxins. Aflatoxin B1 (AFB1) produced by *A. flavus* is the most potent mycotoxin, while *A. parasiticus* and *A. nomius* are capable of synthesizing AFB1, aflatoxin B2 (AFB2), aflatoxin G1 (AFG1) and aflatoxin G2 (AFG2)(5).

History

Aflatoxin was discovered in 1960, in England as the causative agent of Turkey X disease which killed over 100,000 turkeys(6). The outbreak was linked to a Brazilian groundnut meal in which a toxin produced by *Aspergillus flavus* was identified. Therefore, the toxin was named as aflatoxin which was derived from the name *Aspergillus flavus*(7).

The 1st report of human aflatoxicosis outbreak was reported in 1975 from India where more than 100 people had died. Their main food, maize had been contaminated with aflatoxins(8). There had been similar outbreaks globally and around 500 acute illnesses and 200 deaths have been reported due to these outbreaks since 2004 (8).

Sources of aflatoxin

Cereals (rice, corn, and wheat), spices (coriander, black pepper, chili peppers, ginger, and turmeric), oilseeds (peanut, cotton seeds, soybean and sunflower seeds) and tree nuts (Brazil nut, pistachio, walnut, coconut, almond) are the crops which are commonly affected by *Aspergillus* spp.

Animal feed is another major source of aflatoxins for humans. When animals are fed with aflatoxin contaminated food they are transmitted to milk products, eggs and meat exposing the humans to this potent toxin(9).

When cows are fed with food contaminated with AFB1, it is converted to aflatoxin M1(AFM1) by hepatic cytochrome P450 in cows and this new toxin is detectable in their milk 12 to 24 hours later(6). The level of AFM1 in milk is related to the concentration of AFB1 in cows' feed. AFM1 binds well to casein and is heat stable leading to its continued existence during the process of cheese manufacturing. Therefore, AFM1 can be detectable in cheese with concentrations higher than that in the raw milk as milk is concentrated in the process of making cheese(6).

Aflatoxins decompose only at higher temperatures (237-306 ℃)(8). Therefore, aflatoxins are not eliminated during pasteurisation are found in pasteurised milk and dairy products(3). Unfortunately, cooking oil, peanut butter and some cosmetics are also reported to have contaminated with aflatoxins(10).

Clinical impact

High dose exposure to aflatoxins specially to AFB1 can cause acute aflatoxicosis. The level of aflatoxins needed to cause acute aflatoxicosis in humans has not been determined yet (11).

It is commoner in developing countries especially in Africa where there are no stringent regulations for food safety. Aflatoxins are hepatotoxic and liver is the main organ affected. Acute aflatoxicosis in humans results in abdominal pain, vomiting, cerebral oedema, convulsions, coma and even death due to acute liver failure(6).

Apart from causing acute toxicity, aflatoxins result in chronic carcinogenicity in humans. It is a global health problem and even the developed countries have not escaped. AFB1 is linked with high risk of hepatocellular carcinoma (HCC) in the exposed individuals and therefore it is identified as a Group 1 carcinogen by the International Agency of Research on Cancer (IARC). AFM1 is probably carcinogenic to humans and is included in Group 2B(6). Global Cancer Observatory has revealed that, liver malignancy is the sixth commonest malignancy affecting males and females of all ages. Furthermore, it has been reported that 4.6-28.2% of HCC are caused by aflatoxin worldwide(5,12).

Furthermore AFB1 is linked strongly with many different conditions such as malnutrition, growth impairment and immunomodulation in humans(13).

In animals aflatoxins can result in reduction of fertility, decrease in the production of eggs and milk apart from the gastrointestinal symptoms, chronic carcinogenicity and anaemia(6).

Acceptable levels

Strict regulations have been implemented by different countries for aflatoxins in food and feed to secure good health of individuals. The safe limit of aflatoxin is between 4-30 µg/kg for humans. The acceptable level implemented by the European Union is less than 2 µg /kg for the B1 form of aflatoxin and less than 4 µg/kg for total aflatoxins in any product for direct consumption(14). The maximum acceptable limit recognized in United States is 20 µg/kg (10,15). According to Sri Lankan standards maximum level of total aflatoxins is 10 µg/kg and 5µg/kg when it comes to AFB1(9).

Maximum acceptable aflatoxin levels have been identified in feed by FDA. They are 300 µg/kg for finishing cattle, poultry and swine and 100 and 20 µg/kg for breeding cattle, and other animals respectively(16).

Detection

Thin layer chromatography (TLC), high performance liquid chromatography (HPLC) and liquid chromatography mass spectroscopy (LCMS) are the commonly used methods to detect aflatoxins besides enzyme-linked immunosorbent assay (ELISA). Because of certain limitations like lengthy turnaround time and labour intensiveness, several newer methods have emerged. Quantitative polymerase chain reaction (PCR), hyperspectral imaging (HSI) and fluorescence/near-infrared spectroscopy (FS/NIRS) are among them(10).

Preventive strategies

Normal cooking processes do not remove mycotoxins from contaminated food(8). Therefore, prevention of contamination is important. Good manufacturing practices (GMPs), good agricultural practices (GAPs) and good storage practices (GSPs) should be followed to minimise the aflatoxin contamination. Newerprocessing techniques also have a place in maintaining good quality in food products such as treating with UV, electrolyzed water, microwave, ozone, pulsed light, cold plasma, and electron beam and gamma irradiation (10).

Additionally, some natural and synthetic food additives have been used to degrade aflatoxins. Citric acid with high pressure and temperature (200℃) and sodium hydrosulphite with increased pressure have shown to be effective. Furthermore, biological control measures have been used effectively in controlling aflatoxin contamination. When antagonistic strains of *Bacillus*, *Pseudomonas* and *Trichoderma* spp. were inoculated in pre harvest crop, there had been a good outcome with reduction of *A. flavus* in crops. Interestingly, non- aflatoxin producing strains of *A. flavus* and some other nontoxigenic moulds also have been successfully used for this purpose(10).

Situation in Sri Lanka

Jayaratne *et al* have carried out a study in Anuradhapura district in corn grown soil and in corn kernel to detect AFB1 using ELISA method. When interpret according to the FDA limits, both corn kernel and soil contained excess aflatoxins. The concentration in soil was about six times than that of corn kernel probably indicating the source of contamination as soil (17).

Nephrotoxicity is another major concern of mycotoxins including aflatoxins in Sri Lanka. Studies were conducted to find out any association between mycotoxins and chronic kidney disease of uncertain aetiology (CKDu) which is more prevalent in North Central Province of Sri Lanka. Though Wanigasuriya et al detected low levels of ochratoxins in food samples in affected areas in Sri Lanka, Desalegn et al showed high levels of mycotoxins including aflatoxins, ochratoxins and fumonisins in urine samples of CKDu patients and their healthy relatives compared to healthy Japanese individuals (18,19).

Yogendrarajah et al describes a possible dietary exposure to different mycotoxins due to consumption of spices in Sri Lanka. Due to high consumption of chilli in North the mycotoxin exposure was higher in North compared to South. Further their results indicated a potential risk of aflatoxin induced HCC due to consumption of chilli in Sri Lanka (20).

A study done in 2018 has detected high level of aflatoxins in 37.5% of coconut oil samples in Sri Lankan market. Samples included both unbranded and branded products and testing was performed using ELISA followed by HPLC. All positive samples were extracted from copra while virgin coconut oil and other vegetable oil types had aflatoxin below the limit of detection of ELISA. However, there is a significant reduction in aflatoxin levels in this study compared to previous studies in Sri Lanka reflecting the improvement of coconut oil industry in Sri Lanka over the years(21,22).

Most of the above studies done in Sri Lanka are in preliminary stage and need further systematic studies in this field to assess the risk of exposure to aflatoxins in Sri Lanka and thereby to strengthen the regulatory aspect. Recently Sri Lanka Standards Institute (SLSI) has taken steps to control aflatoxins in coconut oil in the country. According to SLS 32:2017 total aflatoxin level should not exceed 10.0 µg/kg in coconut oil in Sri Lanka where maximum AFBI should be 5.0 µg/kg. But it is still not compulsory to follow these standards by all coconut oil producers and importers in Sri Lanka. The Industrial Technology Institute (ITI) is engaged in detection of aflatoxins in different items such as cereals, spices, coconut oil, milk etc using LC-MS-MS with much lower aflatoxin detection limits on request from the respective industries(23,24).

Since there is no stringent regulation of aflatoxin contamination of food and feed in Sri Lanka it is very essential to establish appropriate legislations by policymakers to prevent health hazards caused by this potent toxin.

Conclusion

Aflatoxins are a subgroup of mycotoxins which are mainly produced by *A. flavus.* Conditions favouring fungal growth will increase the risk of aflatoxin contamination of food. They cause acute as well as long term severe health related issues in both humans and animals. Therefore, strict regulations should beimplemented to monitor aflatoxin levels in food and relevant authorities and public should be more vigilant and compliant with the methods of minimizing aflatoxin contamination and thereby reduce the consumption of this potent toxin.

References

1. Gnonlonfin GJB, Hell K, Adjovi Y, Fandohan P, Koudande DO, Mensah GA, et al. A Review on Aflatoxin Contamination and Its Implications in the Developing World: A Sub-Saharan African Perspective. Crit Rev Food Sci Nutr. 2013 Jan;53(4):349–65.
2. Bennett JW, Klich M. Mycotoxins. Clin Microbiol Rev. 2003 Jul;16(3):497–516.
3. Rossiter S. Aflatoxins in food: Overview, meaning and scientific definitions [Internet]. [cited 2021 Mar 29]. Available from: https://www.ifis.org/blog/aflatoxins-overview-and-definitions
4. Mycotoxins [Internet]. [cited 2021 Apr 2]. Available from: https://www.who.int/news-room/fact- sheets/detail/mycotoxins
5. Pickova D, Ostry V, Malir F. A Recent Overview of Producers and Important Dietary Sources of Aflatoxins. Toxins. 2021 Mar 3;13(3):186.
6. Alshannaq A, Yu JH. Occurrence, Toxicity, and Analysis of Major Mycotoxins in Food. Int J Environ Res Public Health. 2017 Jun 13;14(6):632.
7. Negash D. A review of aflatoxin: occurrence, prevention, and gaps in both food and feed safety. J Nutr Health Food Eng [Internet]. 2018 Mar 29 [cited 2021 Mar 28];8(2). Available from: https://medcraveonline.com/JNHFE/a-review-of-aflatoxin-occurrence-prevention-and-gaps-in-both-food- and-feed-safety.html
8. Kumar P, Mahato DK, Kamle M, Mohanta TK, Kang SG. Aflatoxins: A Global Concern for Food Safety, Human Health and Their Management. Front Microbiol [Internet]. 2017 Jan 17 [cited 2021 Mar 29];07. Available from: http://journal.frontiersin.org/article/10.3389/fmicb.2016.02170/full
9. Learning the bitter truth about Aflatoxins [Internet]. Print Edition - The Sunday Times, Sri Lanka. [cited 2022 Jun 25]. Available from: http://www.sundaytimes.lk/210425/plus/learning-the-bitter-truth-about- aflatoxins-440562.html
10. Mahato DK, Lee KE, Kamle M, Devi S, Dewangan KN, Kumar P, et al. Aflatoxins in Food and Feed: An Overview on Prevalence, Detection and Control Strategies. Front Microbiol. 2019 Oct 4;10:2266.
11. Samuel N. Acute Aflatoxicosis Resulting in Fulminant Hepatic Failure and Rhabdomyolysis. Gastroenterol Res [Internet]. 2009 Jan [cited 2022 Jun 25]; Available from: http://www.gastrores.org/index.php/Gastrores/article/view/37

12. Liu Y, Wu F. Global Burden of Aflatoxin-Induced Hepatocellular Carcinoma: A Risk Assessment. Environ Health Perspect. 2010 Jun;118(6):818–24.

13. Rushing BR, Selim MI. Aflatoxin B1: A review on metabolism, toxicity, occurrence in food, occupational exposure, and detoxification methods. Food Chem Toxicol. 2019 Feb;124:81–100.

14. Commission Regulation (EU) No 165/2010 of 26 February 2010 amending Regulation (EC) No 1881/2006 setting maximum levels for certain contaminants in foodstuffs as regards aflatoxinsText with EEA relevance. :5.

15. Wu F. Mycotoxin Reduction in Bt Corn: Potential Economic, Health, and Regulatory Impacts. Transgenic Res. 2006 Jun 1;15(3):277–89.

16. Korley Kortei N, Akomeah Agyekum A, Akuamoa F, Baffour VK, Wiisibie Alidu H. Risk assessment and exposure to levels of naturally occurring aflatoxins in some packaged cereals and cereal based foods consumed in Accra, Ghana. Toxicol Rep. 2019;6:34–41.

17. Jayaratne WMSC, Abeyratne AHMAK, De Zoysa HKS, Dissanayake DMRBN, Bamunuarachchige TC, Waisundara VY, et al. Detection and quantification of Aflatoxin B1 in corn and corn-grown soils in the district of Anuradhapura, Sri Lanka. Heliyon. 2020 Oct;6(10):e05319.

18. Wanigasuriya KP, Peiris H, Ileperuma N, Peiris-John RJ, Wickremasinghe R. Could ochratoxin A in food commodities be the cause of chronic kidney disease in Sri Lanka? Trans R Soc Trop Med Hyg. 2008 Jul;102(7):726–8.

19. Desalegn B, Nanayakkara S, Harada KH, Hitomi T, Chandrajith R, Karunaratne U, et al. Mycotoxin Detection in Urine Samples from Patients with Chronic Kidney Disease of Uncertain Etiology in Sri Lanka. Bull Environ Contam Toxicol. 2011 Jul;87(1):6–10.

20. Yogendrarajah P, Jacxsens L, Lachat C, Walpita CN, Kolsteren P, De Saeger S, et al. Public health risk associated with the co-occurrence of mycotoxins in spices consumed in Sri Lanka. Food Chem Toxicol. 2014 Dec;74:240–8.

21. Karunarathna NB, Fernando CJ, Munasinghe DMS, Fernando R. Occurrence of aflatoxins in edible vegetable oils in Sri Lanka. Food Control. 2019 Jul;101:97–103.

22. Samarajeewa U, Gamage TV, Arseculeratne SN. Aflatoxin contamination of coconut oil from small scale mills: toxin levels and their relation to free fatty acid content. J Natl Sci Found Sri Lanka. 1983 Jan 30;11(2):203–10.

23. The aflatoxins in Sri Lanka's coconut oil [Internet]. [cited 2022 Jun 25]. Available from: https://www.diagri.lk/2021/04/the-aflatoxins-in-sri-lankas-coconut-oil.html

24. Aflatoxins in coconut oil [Internet]. Daily News. [cited 2022 Jun 25]. Available from: https://www.dailynews.lk/2021/04/29/features/247801/aflatoxins-coconut-oil

A fatal case of Listeria meningitis complicated with intra-cerebral haemorrhage

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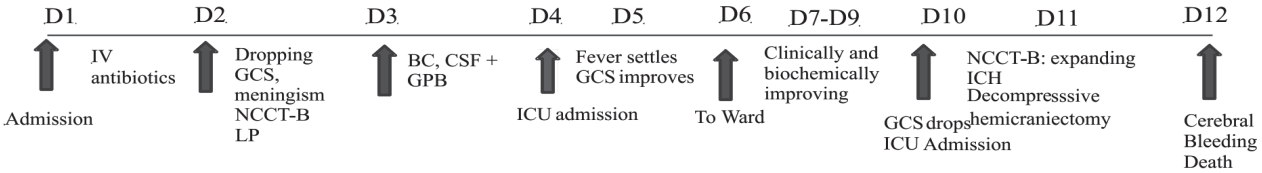
Introduction

Bacterial meningitis is a neurological emergency associated with substantial mortality irrespective of improved diagnostics and therapeutic measures. *Listeria monocytogenes* is known to cause more severe invasive disease like neurolisteriosis in several populations including the elderly. (1) Here we describe a fatal case of neurolisteriosis complicated with intra-cerebral haemorrhage which is probably the first case reported in Sri Lanka to the best of our knowledge.

Case history

Time Line



A 61-year-old manual labourer from Galle presented with fever and severe headache for 2days. On admission he was disoriented but had no meningism or focal neurological signs. His GCS (Glasgow Coma Scale) deteriorated over next 24 hours while he developed features of meningism. He was a newly diagnosed diabetic but had neither significant surgical history nor recent overseas travel history. He had no history of recent gastroenteritis. However, he has been a vegetarian and had a history of recent unpasteurized milk ingestion. He had been on proton pump inhibitors (PPI) for more than one month for gastritis.

His full blood count showed total white cell count of $23´10^9$/ l with neutrophil leukocytosis and thrombocytopaenia where blood picture concluded as severe bacterial infection. He had high CRP of 168 mg/L and hyponatraemia. His initial non-contrast CT (NCCT) brain was normal. Thus, he was started on IV ceftriaxone 2g 12 hourly, IV ampicillin 2g 4 hourly and IV dexamethasone 8mg 8 hourly on suspicion of severe bacterial meningitis around 8 hours after admission. Two blood cultures which were collected before starting antibiotics became positive for Gram positive bacilli after 28 and 30 hours of incubation respectively. Though he underwent lumbar puncture after 24 hours of starting effective antimicrobial therapy, cerebro-spinal fluid (CSF) full report supported bacterial meningitis with polymorphs $550 ´10^6$/l, lymphocytes $80´10^6$/l, high protein of 102 mg/dl and low glucose of 33 mg/dl while random blood glucose at the time was 181mg/dl. CSF Gram stain did not show organisms. Both blood cultures and CSF culture grew small (~1 mm), greyish white colonies with underlying narrow beta haemolysis on blood agar. Gram stain from colony showed Gram positive bacilli with a morphology similar to diphtheroids. It was catalase positive and oxidase negative. Bile esculin was positive and tumbling motility was demonstrated at 20 °C but not at 37 °C. Organism was identified as *Listeria monocytogenes* via Vitek 2 identification system.

In next three days, patient improved clinically and biochemically with effective antibiotic therapy. Three days later his consciousness suddenly deteriorated and NCCT brain showed left parieto-occipital haemorrhage. However, he was normotensive throughout. As GCS dropped further, NCCT brain was repeated which showed rapidly expanding intra-cerebral haemorrhage (ICH) over 8 hours.

Emergency left decompressive hemicraniectomy and evacuation of ICH was done. Despite enormous supports, patient succumbed to left fronto-temporo-parietal ICH as a complication of severe bacterial meningitis.

Discussion

Listeria monocytogenes is a zoonotic and food borne pathogen which causes meningoencephalitis more commonly than isolated meningitis proving its' proclivity for the cerebrum itself. (1) Probable source of infection in our patient was unpasteurized milk and organism's survival might have been encouraged by low gastric acidity caused by PPI use. Positive blood cultures together with CSF culture at the time of diagnosis reflects higher bacterial load and weaker host defenses causing higher mortality. Prompt empirical therapy with IV ampicillin would have caused initial clinical improvement. However, adjunctive treatment with steroids might have played a role in poor clinical outcome in this patient making both infection and glycaemia uncontrolled.(2) Initial clinical improvement let the benefit of addition of an aminoglycoside uncertain.(3) In the absence of common predisposing factors, the incidence of ICH probably can be attributed to *Listeria* meningoencephalitis. ICH is a rare but known complication of *Listeria* meningitis especially in adults, which is also one of the determinants of unfavorable outcomes.(4) Its pathogenesis is still unknown and may be due to dysregulation of both the coagulation and fibrinolytic pathways and to vascular endothelial cell oedema and activation.(5) Thus, neurolisteriosis is an entity warranting more scientific understanding on evolution of natural course and therapeutic measures.

References

1. Bennett J, DR and BM. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 9th ed. Philadelphia: Elsevier; 2020.

2. Charlier C, Perrodeau É, Leclercq A, et al. Clinical features and prognostic factors of listeriosis: the MONALISA national prospective cohort study. The Lancet Infectious Diseases. 2017;17(5).

3. van de Beek D, Cabellos C, Dzupova O, et al. ESCMID guideline: Diagnosis and treatment of acute bacterial meningitis. Clinical Microbiology and Infection. 2016;22.

4. Mook-Kanamori BB, Fritz D, Brouwer MC, van der Ende A, van de Beek D. Intracerebral Hemorrhages in Adults with Community Associated Bacterial Meningitis in Adults: Should We Reconsider Anticoagulant Therapy? PLoS ONE. 2012;7(9).

5. Liang JJ, He XY, Ye H. Rhombencephalitis caused by Listeria monocytogenes with hydrocephalus and intracranial hemorrhage: A case report and review of the literature. World Journal of Clinical Cases. 2019;7(4).

Small bowel necrosis leading to *Clostridium sordellii* bacteraemia: A case report

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Introduction

Costridium sordellii, first isolated in 1922 by the Argentinian microbiologist Alfredo Sordelli in a patient with post-operative gas gangrene (1), is a Gram-positive spore forming anaerobic bacillus. This organism is commonly found in the soil and is known to inhabit intestines of 0.5% of the human population. Even though it is known to cause disease in animals, human cases have been reported less frequently (2). To the best of our knowledge this is the first reported case of *C. sordellii* bacteraemia in Sri Lanka.

Case report

A 19-year-old schoolgirl presented with generalised abdominal pain, nausea and vomiting for one-day duration. She had no fever or symptoms related to the urogenital tract. Four years back, she underwent an emergency exploratory laparotomy and findings were gangrenous appendix and moderate amount of pus in the peritoneal cavity.

She was ill looking but afebrile and haemodynamically stable. Abdominal examination revealed central and suprapubic tenderness with sluggish bowel sounds. A clinical diagnosis of subacute bowel obstruction was made. Initial investigations showed white blood cell (WBC) count (13.52×10^9/L) with 90% neutrophils, C-reactive protein (CRP) of 1.2mg/L, and normal liver and renal functions. Multiple dilated small bowel loops in the ultrasound scan favoured the clinical diagnosis.

On the third day of admission, she developed fever of 102^0F and CRP increased to 115mg/L. Intravenous (IV) amoxicillin-clavulanate and metronidazole were started after taking blood and urine cultures. Contrast-enhanced CT scan of the abdomen showed features of small bowel obstruction with a mid-ileal transition point.

Blood culture flagged positive in the BacT/ALERT^R platform following 31 hours of incubation. Direct smear showed Gram positive bacilli. However, there was no growth on routine culture media with aerobic incubation at 35^0C after 48 hours. Culture was referred to Anaerobic Reference Laboratory (ARL), Medical Research Institute (MRI). Her urine culture remained negative.

On the fifth day, as fever and vomiting were continuing and CRP was 320mg/L an opened laparotomy was performed. During the surgery a 30cm-long, gangrenous ileal loop due to strangulation by a tight adhesion band was resected and multiple adhesions were lysed.

On the second day post-operatively CRP reduced to 100.2mg/L and she was started on oral diet. She was discharged home on post-operative day six. On discharge, CRP was 55mg/L. Intravenous amoxicillin- clavulanate and metronidazole were given for nine days and discharged on oral amoxicillin-clavulanate for another five days. She remained well without any complications at 4 weeks post-surgically.

At ARL, MRI, positive blood culture was inoculated onto Brucella blood agar (BBA), Bacteroides bile esculin agar (BBE) and blood agar and incubated anaerobically at 37^0C for 48 hours. Aerotolerance test was performed by subculturing the organism grown anaerobically on BBA and incubating aerobically. It was a Gram-positive bacilli with a central spore and, was lecithinase positive and lipase negative on egg yolk agar. It was identified as *C. sordellii* using RapID™ ANA 11 (Remel) system. It was sensitive to metronidazole by agar dilution method.

Discussion

Even though *C.sordellii* is a rare cause of human illness, it has been identified as the pathogen in several case reports around the world. Most common disease entities are toxic shock, bacteraemia and soft tissue infections (3). Pregnancy related events including natural delivery and spontaneous or medically induced abortions, injection drug use, immunosuppression due to any reason and trauma including surgeries are recognized as associated factors (2). In this patient, devitalisation of tissues following strangulation was the probable predisposing factor.

High mortality rate (nearly 69%) associated with these infections are thought to be due to virulence of pathogenic strains. Lethal toxin and haemorrhagic toxin are regarded as the main toxins mediating severe disease with classic features such as leukaemoid reaction (WBC count $>50x10^9$/L), refractory hypotension, severe tachycardia, profound capillary leak syndrome, haemo-concentration and persistent absence of fever (2). Our patient did not show any of these symptoms indicating that probably this strain is non-toxigenic or toxin buildup was effectively stopped with the surgical intervention. Identification of toxins or genes encoding them could not be done on this isolate.

Rapid diagnostic tests and nucleic acid amplification tests are largely unavailable for the diagnosis. In Sri Lanka, diagnosis is done using conventional anaerobic culture which is time consuming. Appropriate antimicrobial treatment, source control by surgery and overall care of the patient including fluids and vasopressors are all important in the management. Previous studies show that this organism is sensitive to β-lactams, clindamycin, metronidazole, linezolid, vancomycin, tigecycline, rifampicin, tetracycline and chloramphenicol but resistant to aminoglycosides and sulfonamides (2,4). Timely intervention with appropriate antibiotics and source control contributed to a favourable outcome in this patient.

References

1. Stoppani AOM, Méndez BS, Sordelli DO. Remembering a microbiologist: Alfredo Sordelli (1891- 1967). *Int Microbiol*. 2001; 4: 237-238.

2. Aldape MJ, Bryant AE, Stevens DL. *Clostridium sordellii* infection: Epidemiology, Clinical Findings, and Current Perspectives on Diagnosis and Treatment. *Clin Infect Dis*. 2006; 43: 1436- 1446.

3. Rabi R, Turnbull L, Whitchurch CB, Awad M, Lyras D. Structural Characterization of *Clostridium sordellii* Spores of Diverse Human, Animal, and Environmental Origin and Comparison to *Clostridium difficile*. *mSphere*. 2017; 2(5): e00343-17.

4. Zerrouki H, Rebiahi SA, Elhabiri Y, et al. Prevalence and Antimicrobial Resistance of *Paeniclostridium sordellii* in Hospital Settings. *Antibiotics*. 2022; 11(38).

Delusional parasitosis

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Introduction

In the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM 5), delusional parasitosis is described as a disorder with one or more persistent delusions that are not due to any other condition[(1)]. In the International Classification of Diseases of the tenth revision (ICD 10), it is grouped in the class of persistent delusional disorders [(2)]. In a delusional disorder a person typically in middle or later life, develops a stable encapsulated delusional system over some time, with no impairment of other mental functions. Delusional parasitosis is in the sub-category of somatic delusional disorders where the patient firmly believes, on inadequate grounds, that they suffer from a physical illness, deformity, or an infestation[(3)]. It is also called 'Ekbom syndrome' after the Swedish neurologist Karl Axel Ekbom, who conducted substantial work on this condition.

What is delusional parasitosis?

In delusional parasitosis, the person has a fixed, firm, conviction that there are macroparasites such as helminths or smaller organisms (Eg: lice, fleas, spiders, worms) present on the skin, regardless of any medical evidence to support this claim. Apart from the delusion, patients have associated tactile hallucinations where they describe the feeling of parasites crawling or burrowing into the skin. There may be evidence of skin lesions that may be present in the form of bruises, nodular pruritis, ulcers, and scars in the skin of the hands, arms, feet, lower legs, scalp, the upper back, and breast region, and the genitals or body orifices such as the nose, ears, mouth, anus, and the gastrointestinal tract. These injuries are the results of the patient's effort to extract the parasites from the skin/affected body part. These patients typically present with clothing lint, pieces of skin, or other debris contained in plastic bags, jars, envelopes, or adhesive tape claiming that they contain the parasites compulsively trying to gather evidence. This presentation is known as the 'matchbox sign.'

Delusional parasitosis is categorized into primary, secondary, and organic forms. In the primary form, the delusions of parasitic infection are the only symptoms present, and there is no evidence of other psychiatric or organic disorders. The secondary conditions occur as a part of another primary psychiatric disorder such as schizophrenia, depression, or dementia. The third category, organic delusional parasitosis arises secondary to organic causes like medical illness (e.g., hypothyroidism, anaemia, vitamin B12 deficiency, hepatitis, diabetes, infections like HIV, syphilis), or cocaine abuse [(4)].

Socio-demography

The aetiology of the condition is unknown. Delusions of parasitosis are commoner in middle-aged, often socially isolated women belonging to the average age is 57 ± 14 years. A ratio of 2:1 for females to males has been reported by some researchers [(6)].

History

Patients with delusional parasitosis often give a history of applying topical dermatologic medications and/or antibiotics to treat the condition. Many of them have tried pest and insect control measures for their homes. Some patients give false descriptions of parasites and the timing of infestations. In about 5–15% of cases, close relatives may experience identical delusions[5]. Most patients self-diagnose using Internet- based dissemination of the condition which is known as '*folie à Internet*.' Patients may feel frustrated and feel disrespected. They even lose trust in their usual doctor, accusing that the doctor did not take time to listen to their complaints or symptoms and paid enough attention. Consequently, the patient visits other doctors for second opinions. Secondary depression is common among these patients.

Examination findings

Physical examination may reveal no lesions on the skin or minor scratches, ulcers excoriation, discreet bruises, erosions, and cuts, mainly due to self-inflicted damage caused by the efforts to remove fictitious parasites. Some of these lesions are caused by scratching, habitual obsessive cleaning, applying erosive chemicals, or using adhesive materials on the skin to remove the fictitious parasitic materials.

A comprehensive physical examination and appropriate investigations are necessary to rule out other diseases that may cause itching. Secondary causes such as medical illnesses (Eg: hyperthyroidism, B12 and folate deficiencies, neuropathy, and diabetes), neurologic conditions (Eg: dementia, stroke, multiple sclerosis, encephalitis, meningitis, and post-surgical complications from neurosurgery), psychoactive substance abuse (Eg: cocaine, alcohol), infections (Eg: HIV, tuberculosis, leprosy, and syphilis) and side effects of medications (eg: medications such as topiramate, ciprofloxacin, amantadine, steroids, ketoconazole, and phenelzine) should be excluded as the cause of developing delusional parasitosis.

Investigations and Diagnosis

Most cases of delusional parasitosis can be diagnosed purely based on the history and mental state examination. However, in some instances, before establishing the diagnosis of delusional parasitosis, an actual parasite infestation of the skin should be excluded. Arthropod-borne infestations such as scabies, body louse, ticks and mites of animals, bed bugs, and helminth infections such as dirofilariasis (zoonotic filariasis), cutaneous larva migrans, larva currens (by *Strongyloides stercoralis*), and cercarial dermatitis (swimmer's itch) should be considered in the differential diagnosis. Relevant investigations such as microscopic examination of skin scrapings to rule out scabies and microscopic examination of hair to exclude louse infestations can be done. Microscopy of cloth lint/fibres brought by the patient will be useful to reassure the patient that they were not worms. These investigations will boost and win the patient's confidence, which is crucial for further management.

Treatment

Patients with delusional parasitosis usually present to general practitioners or dermatologists. First step should be to refer to a parasitologist who could exclude the possibility of parasitic aetiology. This is particularly important in patients where the delusional parasitosis seems to have occurred following a skin condition. It is critical not to dismiss the complaints while being careful not to reinforce the delusion. The doctor should show that he/she takes a neutral stance. It is essential that the doctor acknowledges the distress and frustration the patients experience. Parasitologist should state that there are no parasites visible after a thorough examination. Excluding parasitic infestations by laboratory tests can assure the patient that the treating doctor is not ignoring their complaints. Subsequently, when the tentative diagnosis of delusional parasitosis is made, the patient should be referred to a psychiatrist for treatment. Referral to a psychiatrist is challenging because the patient is in the firm

belief that they have a parasitic infestation and thus does not accept the diagnosis of a psychiatric disorder. The doctor-patient relationship is crucial in achieving this essential step which paves the way for successful treatment. Since the patient perceives the insects are crawling, resulting in severe distress and sleepless nights, it is essential to provide psychological support and, at times, medical treatment. In the literature, pimozide is being discussed as a treatment for delusional parasitosis. Even though any antipsychotic can be used, the current management is mostly with second-generation antipsychotics such as risperidone, olanzapine, and quetiapine [7]. An overall response rate of 50-70% has been reported for antipsychotic treatment. The difficulty is to convince to take the medication and retain patient compliance to medications.

References

1. Association AP. DSM 5. Am J Psychiatry [Internet]. 2013;991. Available from: http://ajp.psychiatryonline.org/article.aspx?articleID=158714%5Cnhttp://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:DSM-5#0

2. Organization WH. The ICD-10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines. WorldHealthOrganization [Internet]. 1992;1–267. Available from: http://apps.who.int/iris/handle/10665/37958%5Cnhttp://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:The+ICD-10+Classification+of+Mental+and+Behavioural+Disorders#1

3. Harrison P, Cowen P, Burns T, Fazel M. Shorter Oxford Textbook of Psychiatry. Shorter Oxford Textbook of Psychiatry. 2017.

4. Alves CJM, Martelli ACC, Fogagnolo L et al. Secondary Ekbom syndrome to organic disorder: report of three cases. An Bras Dermatol. 2010;85:541–4.

5. Harth W, Gieler U, Kusnir D, Tausk FA. Clinical management in psychodermatology. Clinical Management in Psychodermatology. 2009. 1–297 p.

6. W. T. 100 years of delusional parasitosis. Psychopathology. 1995;28:238–246.

7. Reich, A., Kwiatkowska, D., & Pacan P. Delusions of Parasitosis: An Update. Dermatol Ther (Heidelb). 2019;9(4):631–8.

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The Bulletin of the Sri Lanka College of Microbiologists is the annual publication of the Sri Lanka College of Microbiologists issued along with the Annual Scientific Sessions of the College. The Bulletin includes the summaries of the speeches/lectures/symposia and abstracts of oral/ poster presentations to be made during the Annual Scientific Sessions in addition to reviews, research articles and case reports relevant to microbiology and infectious diseases sent by the membership. The aims of the bulletin are to encourage the membership to conduct and publish good quality research to support and improve the practice of microbiology in Sri Lanka and to share experiences to enrich and upgrade the professional standards.

All manuscripts will be subjected to review before acceptance and will be accepted with the understanding that the work is not being submitted simultaneously to another journal and has not been already published /accepted for publication elsewhere.

TYPES OF CONTRIBUTIONS

Review articles

Editorial board selects one or more from the articles submitted as review articles. This should contain less than 2000 words and address a microbiologically significant topic of current interest. This article should be supported by no more than 20 key references.

Research (original) articles

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 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.

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.

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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).

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* **A cover letter** should include a declaration signed by the principal author and co-authors to certify.
  - the originality of the article.
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  - 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 content 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.

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

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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. Photo-micrographs 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.

Acknowledgments

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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.

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Annual Scientific Sessions of the Sri Lanka College of Microbiologists August 2022

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