College of Chemical Pathologists of Sri Lanka

2nd Annual Academic Sessions 2017

"Chemical Pathology - the bridge for better patient care"

24th & 25th February 2017
Grand Ball Room, Galle Face Hotel, Colombo

Under the "Auspices" of the
ASIA-PACIFIC FEDERATION FOR
CLINICAL BIOCHEMISTRY AND
LABORATORY MEDICINE (APFCB)

CONTENTS

MESSAGE FROM THE PRESIDENT OF THE COLLEGE OF CHEMICAL PATHOLOGISTS OF SRI LANKA

On behalf of the College of Chemical Pathologists, it is my great pleasure and honour to invite you to participate in the 2nd Annual Academic Sessions of the College of Chemical Pathologists of Sri Lanka (AAS, CCPSL, 2017) on 24th and 25th of February 2017 at Galle Face Hotel, Colombo.

Well known international experts from UK, Australia, Singapore and India and national experts in the fields of chemical pathology, laboratory medicine and other clinical disciplines will be the faculty in this conference. Academic programme covers the important topics of Chemical Pathology while addressing some of the contemporary topics in other specialties in keeping with our theme "Chemical Pathology – the bridge for better patient care". I am certain that not only the chemical pathologists will benefit from this programme but also the clinicians in other disciplines. The AAS, CCPSL, 2017 creates an opportunity for researchers to present their scientific work and communicate with the experts in the field of research.

In addition to main academic sessions, there will be a parallel workshop on medical laboratory sciences and an industrial exhibition. A wide audience including chemical pathologists, clinicians, postgraduate trainees in different fields of medicine and medical laboratory technologists are expected to attend the conference.

I invite international delegates to participate in this great event. This will be a wonderful opportunity for you to explore our beautiful country - Sri Lanka and discover its scenic natural beauty and ancient history to cherish forever.

Dr. Chandrika Meegama

MESSAGE FROM THE CHIEF GUEST HIS EXCELLENCY MAITHRIPALA SIRISENA, PRESIDENT OF THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

I am pleased to send this message to the College of Chemical Pathologists on the occasion of the inauguration of the Annual Academic Sessions and induction of the President of the College of Chemical Pathologists of Sri Lanka.

I strongly feel that patient care is of utmost importance. Hence, the theme selected this year, “Chemical Pathology-the bridge for better patient care” is most appropriate as Chemical Pathology is one of the most dynamic and rapidly evolving specialties with a very high demand from clinicians for better patient care.

I believe that the two day programme will contribute immensely to upgrade the clinical and technical knowledge of medical professionals in the field of Chemical Pathology, thus assisting further advancement of our health service.

I take this opportunity to convey my best wishes for Annual Academic Sessions of the College of Chemical Pathologists and also wish great success in its future endeavors.

His Excellency Maithripala Sirisena
Honourable President
Democratic Socialist Republic of Sri Lanka

MESSAGE FROM DR. RAJITHA SENARATNE THE HONOURABLE MINISTER OF HEALTH AND INDIGENOUS MEDICINE OF SRI LANKA

It is my great pleasure to send this message to convey my best wishes on the inauguration of the Annual Acadaemic Sessions of the College of Chemical Pathologists, Sri Lanka 2017. I wish to take this opportunity to express my commitment to work with the College towards achieving the common goal of providing the best possible health care for every citizen of Sri Lanka.

I think this year's Theme "Chemical Pathology-the bridge for better patient care" is most appropriate as laboratory investigations pave the way for the clinicians to arrive at correct diagnosis, to monitor treatment and in averting complications. I greatly appreciate president and Council of the College of Chemical Pathologists for their effort in organizing the Annual Academic Sessions addressing a very topical theme which would undoubtedly help to improve the quality of health care delivered to our people .

Maintaining the accuracy of laboratory test results and other service standards to address the expectations of clinicians and ensuring service reliability is a major challenge for Chemical Pathologists. As such, these aspects of laboratory services should be given a higher priority. My vision is to upgrade the free health care system in our country to minimize the financial burden of every citizen who seeks health care at government sector. Therefore, I look forward to building up a closer dialogue with the College towards working out a strategy to improve the quality and efficiency of our laboratory services to international standards.

I wish to extend my warm wishes to the president and the Council of College of Chemical Pathologists of Sri Lanka for the success of this event and any future activities in professional development, which would help the Ministry's effort in improving the health care delivery system in our country.

Dr. Rajitha Senaratne
Honourable Minister of Health, Nutrition & Indigenous Medicine

MESSAGE FROM THE DIRECTOR GENERAL OF HEALTH SERVICES DR. J.M.W. JAYASUNDARA BANDARA

It is with pleasure I send this message to convey my best wishes on the occasion of the 2nd Inaugural Annual Academic Session of College of Chemical Pathologists of Sri Lanka.

Laboratory medicine in general and Chemical Pathology in particular is an essential field to assist clinicians in the diagnosis, management and follow-up of various disorders. The theme of this year "Chemical Pathology-the bridge for better patient care" is most appropriate as there is a high demand for testing from clinicians related to the field of Chemical Pathology to achieve better patient care.

Further, I understand that a number of overseas guest speakers are attending the congress. This is a good step to broaden the international cooperation to enhance the knowledge, experience and technology in Chemical Pathology in Sri Lanka.

While conveying my best wishes for a successful Annual Acadaemic Session I take this opportunity to appreciate the efforts of all those who are involved in organizing this event. I also wish to assure continuous support for the present and future endeavors undertaken by the College of Chemical Pathologists.

Dr. J.M.W. Jayasundara Bandara

MESSAGE FROM THE JOINT SECRETARIES OF THE COLLEGE OF CHEMICAL PATHOLOGISTS OF SRI LANKA

We write this message with great pleasure on the occasion of the 2nd Annual Academic Sessions of the College of Chemical Pathologists of Sri Lanka which scripts a very important landmark in the history of the very young college. Chemical pathology has evolved rapidly as an essential specialty in Sri Lanka and this is revealed by a vibrant event of this magnitude. Both the availability of expertise and advancement of technology have contributed equally to this revolution in the field.

We are esteemed to have His Excellency Maithripala Sirisena, the president of the Democratic Socialist Republic of Sri Lanka as the chief guest to grace this important event. The presence of Dr. Rajitha Senaratne, Honourable Minister of Health and Indigenous Medicine to this memorable moment is an honour to the college. The presence of Dr. Jayasundara Bandara, the Director General of Health Services is an immense strength to the college at this moment.

We would like to extend a warm welcome to the Guest of Honour Dr. Brian Shine, Consultant Chemical Pathologist from John Radcliffe Hospital, Oxford, United Kingdom. We thank all other overseas resource personnel representing Australia, India and Singapore who travelled to our beautiful island to share their expertise. This event will help the college to strengthen the relationships with counterparts in other parts of the world.

We express sincere gratitude to all the local experts including fellow Chemical Pathologists, Endocrinologists, Cardiologists, Nephrologists, Clinical Nutritionists, Haematologists who took time out of their busy schedules to make the academic event a success.

A vibrant academic programme, keeping in line with the year's theme "Chemical Pathology–the bridge for better patient care" will be held for two days from 24th to 25th of February. Accompanying parallel two day work shop for medical laboratory technologists shows one of the diverse roles of the college in molding chemical pathology in the country. In organizing an academic event of this caliber we needed help from a multitude of people. We thank all of them for their dedication, commitment and enthusiasm.

The generous contributions given by the sponsors need to be mentioned as they laid the ground work for success of this event.

We would like to express the sincere appreciation to the president, CCPSL for the leadership given and the council, CCPSL for commitment extended in shaping up this academic event.

We hope the participants will have a very productive and lively two days.

Dr. Thamara Herath
Dr. Gaya Katulanda

MESSAGE FROM THE PRESIDENT OF ASIA PACIFIC FEDERATION FOR CLINICAL BIOCHEMISTRY AND LABORATORY MEDICINE DR. SUNIL SETHI

It is with great pleasure that I write these few words in support of the 2017 Annual Academic Sessions of the College of Chemical Pathologists of Sri Lanka (CCPSL AAS 2017). Firstly, it is with regret that I am not able personally to be with you all at this event. I have gone through the programme for the two-day meeting and I am so impressed with the content and the faculty that has been lined up for the meeting. The topics have been well selected and cover a very broad range, with a good mix of talks and interactive case discussions. The local and international experts will certainly present their topics at the highest level.

Take the opportunity to renew friendships and establish new networking in our scientific area of laboratory medicine. Also do review the offerings of our industry vendor partners who will be present to support the conference. For our foreign visitors, take time to enjoy the beauty of Sri Lanka.

My congratulations to Dr Chandrika, President CCPSL, and her team for the hard work required for this event. I wish everyone a wonderful, informative and entertaining time in Sri Lanka at the 2017 CCPSL AAS.

Dr. Sunil Sethi

MESSAGE FROM THE GUEST OF HONOUR DR. BRIAN SHINE

I am delighted and honoured to be the guest of the Sri Lankan College of Chemical Pathologists. I have been fortunate to be involved training of Chemical Pathologists from Sri Lanka over nearly a decade, from when Dr Gaya Katulanda was in the UK. Since her time with us, we have had many more young trainees from Sri Lanka. While every trainee is different, they share a love and enthusiasm for the subject. They have also exhibited an ability to battle bureaucracy that far exceeds mine.

I have been honoured, also, to visit your country as an external examiner in the Chemical Pathology MD examinations several times. This enables me to meet young trainees, and to interact with more senior members of the profession in Sri Lanka.

Chemical Pathology (Clinical Biochemstry) is the best medical specialty for several reasons. Because it is concerned with the biochemical mechanisms of disease, one needs a wide knowledge of basic biochemistry, encompassing subjects such as energetics, physics, mathematics, and concepts such as cycles, where a limited amount of several intermediary substances can control the entire fate of the organism. At a higher level, Clinical Biochemistry can help to explain complex physiological mechanisms, such as the way in which the kidney handles electrolytes, how hormones exert their effects, and the central role of the liver in metabolism.

To run a laboratory, you need to to be able to set up and validate analytical methods, and to understand management, and budgets. This requires a knowledge of technology, biochemistry, chemistry, statistics, and how to find the information to use for all of these steps. You need to be an expert in calibration, internal quality control and external quality assessment.

At a clinical level, Chemical Pathologists are able to help their colleagues understand the mechanisms of diseases, and to investigate patients efficiently and effectively to make a diagnosis and establish rational treatments. Chemical Pathologists are also in a unique position to help manage patients with diabetes, metabolic bone disease, inherited metabolic disorders, and disorders of nutrition and lipids.

I look forward to hearing your talks, to interacting with you, and to sharing your insights into the subject.

Dr. Brian Shine

COUNCIL 2017, COLLEGE OF CHEMICAL PATHOLOGISTS OF SRI LANKA

Sitting (Left to right): Dr Kisali Hirimutugoda (Editor), Dr Thamara Herath (Secretary), Dr Saroja Siriwardene (Honourary Adviser), Dr Chandrika Meegama (President), Dr Gaya Katulanda (Secretary), Dr Dilinika Perera (Editor), Dr Roshitha de Silva (Treasurer)

Standing (Left to right): Dr Neranjana Vithanage, Dr S I Majitha, Dr Dulani Jayawardena, Dr Nangai Kularatnam, Dr Thushara Hewageegana, Dr Deepani Siriwardhana, Dr Eresha Jasinge

Absent: Dr BKTP Dayanath (President-Elect), Dr Rajitha Samarasinghe, Dr Manjula Dissanayake

Council of the College of Chemical Pathologists of Sri Lanka – 2017

President	Dr. Chandrika Meegama
President-elect	Dr. BKPT Dayanath
Immediate Past President	Late Dr. Meliyanthi M Gunatillake
Honourary advisor	D.r Saroja Siriwardene
Joint Secretaries	Dr. Gaya Katulanda
	Dr. Thamara Herath
Treasurer	Dr. Roshitha de Silva
Joint Editors	Dr. Kisali Hirimutugoda
	Dr. Dilinika Perera
Council Members	Dr. Eresha Jasinge
	Dr. Deepani Siriwardena
	Dr. Rajitha Samarasinghe
	Dr. Manjula Dissanayake
	Dr. Dulani Jayawardane
	Dr. S I Majitha
	Dr. Thushara Hewageegana
	Dr. Neranjana Withanage
	Dr. Nangai Kularatnam

ACADEMIC PROGRAMME

Day 01 - February 24th, 2017

8.00 - 8.25	**Registration**
8.25 - 8.30	**Welcome Address** President, CCPSL
8.30 - 8.55	**Plenary 1** *Chairpersons: Dr Saroja Siriwardene & Dr Rajitha Samarasinghe* **Common acid base disorders - Dr Thushara Hewageegana**
8.55 - 9.20	**Plenary 2** *Chairpersons: Dr Eresha Jasinge & Dr S I Majitha* **Approach to hypokalemia - Dr Kisali Hirimuthugoda**
9.20 - 10.30	**Symposium on Renal Disease** *Chairpersons: Dr Deepani Siriwardhana & Dr Thushara Hewageegana* **Biochemical changes in CKD - Dr Roshitha de Silva** **Management of CKD - Dr A L M Nazar** **"Enzymatic creatinine assay" - Dr B K T P Dayanath**
10.30 - 11.00	Tea and opening of the Trade exhibition
11.00 - 11.25	**Plenary 3** *Chairpersons: Dr B K T P Dayanath & Dr Gaya Katulanda* **Adventures with electrolytes - Dr Brian Shine**
11.45 - 12.35	**Symposium on Cardiovascular disease** *Chairpersons: Dr Stanley Amarasekera & Dr Manjula Dissanayake* **Screening and risk stratification for primary prevention of coronary artery disease - Dr Neomali Amarasena** **Cardiac biomarkers - Dr Chandrika Meegama** **Inherited lipid disorders - Dr Michael Metz**
12.35 - 1.00	**Plenary 4** *Chairpersons: Dr Saman Peduruhewa & Dr Kisali Hirimuthugoda* **Assessment of nutritional status - Dr Ranil Jayawardena**
1.00 - 2.00	Lunch
2.00 - 2.30	**Interactive case discussion - Dr Dilinika Perera, Dr Nangai Kularatnam, Dr Ganga Withana Pathirana**
2.30 - 3.55	**Symposium on Endocrinology** *Chairpersons: Dr Chandrika Meegama & Dr Thamara Herath* **Functioning pituitary tumours - Dr Noel Somasundaram** **Endocrine tumour markers - Dr Rajitha Samarasinghe** **An update on diagnosis of Cushing syndrome - Dr Manilka Sumanatillake**
3.55 - 4.20	**Providing interpretative comments to laborataory results for the benefit of test requesters - Dr Michael Metz**
4.20	Tea and exhibition viewing

ACADEMIC PROGRAMME

Day 02 - February 25th, 2017

8.00 - 8.30	**Plenary 5** *Chairpersons: Dr Michael Metz & Dr Dulani Jayawardena* **Laboratory assay performance parameters - Dr Yeo Chin Pin**
8.30 - 9.30	**Symposium on Bone disease** *Chairpersons: Dr Yeo Chin Pin & Dr Vithegi Kesawan* **Overview of osteoporosis, present situation and future perspective - Prof Sarath Lekamwasam** **Bone markers - Dr Saman Peduruhewa**
9.30 - 10.55	**Symposium on Diabetes** *Chairpersons: Dr Brian Shine & Dr Kisali Hirimuthugoda* **"Pre diabetes a contentious entity" - Prof Poornima Manjrekar** **Optimizing diabetes care, role of guidelines and laboratory - Dr Prasad Katulanda** **Gestational diabetes mellitus - Dr Deepani Siriwardhana**
10.55 - 11.25	Tea and exhibition viewing
11.25 - 11.55	**Plenary 6** *Chairpersons: Dr Dammika Gunawardena & Dr Dilinika Perera* **Management of Multiple myeloma - Dr Lalindra Gunarathne**
11.55 - 12.25	**Plenary 7** *Chairpersons: Prof Poornima Manjrekar & Dr Gayani Weerasinghe.* **Reference intervals in children - Dr Michael Metz**
12.25 - 12.55	**Plenary 8** *Chairpersons: Dr Roshitha de Silva & Dr Nangai Kularathnam* **Thyroid testing strategies - Dr Brian Shine**
12.55 - 1.55	Lunch
1.55 - 2.25	Chemical pathology quiz **Dr Thushara Hewageegana & Dr Neranjana Vithanage**
2.25 - 2.45	**Plenary 9** *Chairpersons: Dr Saman Peduruhewa & Dr Neranjana Vithanage* **Update on vitamin B12 - Dr Manjula Dissanayake**
2.45 - 4.10	**Symposium on Laboratory Management** *Chairpersons: Dr Chandrika Meegama & Dr Gaya Katulanda* **An introduction to cost-effectiveness in the laboratory - Dr Brian Shine** **Clinical governance - Dr Gayani Weerasinghe** **Use of automation and information technology to enhance quality of laboratory results and efficiency of laboratory operations - Dr Yeo Chin Pin**
4.10 - 4.35	Awards & Closing Remarks
4.35	Tea

WORKSHOP ON MEDICAL LABORATAORY SCIENCES

Day 01 - February 24th, 2017

08.30 am - 10.30 am	**Registration and Inauguration**	
10.30 am - 11.00 am	**Tea**	
11.00 am - 11. 30 am	**" Laboratory quality assurance - practical aspects"**	Dr Yeo Chin Pin
11.30 am - 12.00 pm	**Screening for CKD – role of the laboratory**	Dr Thamara Herath
12.00 pm - 01.00 pm	**Lunch**	
01.00 pm - 01.30 pm	**Laboratory accreditation**	Dr Saroja Siriwardena
01.30 pm - 02.00 pm	**Automation**	Dr Brian Shine
02.00 pm - 02.30 pm	**Factors affecting quality of paediatric specimens**	Dr Eresha Jasinge
02.30 pm - 03.00 pm	**Tea**	
03.00 pm - 03.30 pm	**hs troponins vs conventional markers**	Dr Vithegi Kesawan
03.30 pm - 04.00 pm	**Serum protein electrophoresis**	Dr Gaya Katulanda

Day 02 - February 25th, 2017

08.30 am - 09.00 am	**Factors affecting estimation of glycated haemoglobin**	Prof. Poornima Manjrekar
09.00 am - 09.30 am	**Quality improvement through Audits**	Dr Gayani Weerasinghe
09.30 am - 10.00 am	**Tea**	
10.00 am - 10.30 am	**Abnormal Electrolytes; How common**	Dr Dulani Jayawardena
10.30 am - 11.00 am	**Interference in immunoassay**	Dr Dilinika Perera
11.00 am - 11.30 am	**Abnormal liver function tests**	Dr S I Majitha
11.30 am - 12.00 pm	**Chemical pathology quiz**	Dr Ganga Withana Pathirana
12.00 pm - 01.00 pm	**Lunch**	
01.00 pm - 01.30 pm	**Renal stone analysis - recent advances**	Dr Neranjana Vithanage
01.30 pm - 02.00 pm	**Abnormal lipid profiles**	Dr Nangai Kularatnam
02.00 pm - 02.30 pm	**Critical values in chemical pathology**	Dr Michael Metz
02.30 pm - 03.00 pm	**Tea**	
03.00 pm - 04.00 pm	**Group exercise and presentations**	Dr Lakmini Ginige
04.00 pm	**Award of certificates**	

FELLOWSHIP AWARDS

Dr. Meliyanthi Gunatillaka
MBBS, D.Path, MD(Chem. Path)
Consultant Chemical Pathologist

Dr. Meliyanthi Megasuriya Gunatillaka, obtained her primary and secondary education from Holy Family Convent, Kurunegela and Graduated from the Faculty of Medicine, University of Colombo in 1985.

She joined the training programme in Pathology of the Postgraduate Institute of Medicine University of Colombo and obtained the Diploma in Pathology. She trained as a registrar in Pathology attached to the Department of Pathology, Teaching Hospital, Karapitiya and National Hospital of Sri Lanka and obtained the MD in Chemical Pathology in 1997 at a time when many people were reluctant to select this specialty.

She then proceeded for her post MD overseas training to Southampton General Hospital, UK. She returned to Sri Lanka in 1999 at a time when there was only one Chemical Pathologist serving the entire Ministry of Health.

She was appointed as Consultant Chemical Pathologist at the Endocrine and Radioisotopic Unit at the Department of Biochemistry, Medical Research Institute (MRI), Colombo. She became the Head, Department of Biochemistry at the MRI in January 2001 and served that Institution until October 2013. She established the Chemical Pathology section in that laboratory and conducted the routine Biochemistry services as well as specialized tests which include hormone and tumour marker assays.

Her interest was in Quality Assurance made her establish the National External Quality Assessment (NEQAS) programme for the state sector hospital laboratories in Sri Lanka. At a time when there was just a handful number of Chemical Pathologists in Sri Lanka, she assisted the peripheral laboratories in the state sector in the establishment of general and specialized biochemical testing by offering training for the technical staff at the Department of Biochemistry at MRI.

Further, she assisted the Ministry of Health in evaluating medical devices, prior to registration at the Cosmetics, Drugs and Devices Authority and the State Pharmaceuticals Cooperation in evaluating chemicals used for biochemical tests.

She took up post as the Consultant Chemical Pathologist at the Department of Biochemistry, at the National Hospital of Sri Lanka in October 2013 and worked towards extending, strengthening and further improving the quality of the Chemical Pathology services offered by the National Hospital.

Over the years she contributed immensely for training and assessment of pathologists at the Post Graduate Institute of Medicine and was a strict disciplinarian who demanded the best from her students. She guided them well in acquiring laboratory skills, with an emphasis on assuring quality.

She had contributed as an examiner and chief examiner for the MD in Chemical Pathology and Diploma in Chemical Pathology examinations and an examiner for the Selection Examination in Pathology many times.

She pioneered the Chemical Pathology postgraduate training at the Medical Research Institute, Colombo emphasising on bench skills. Her dedication for training resulted in all her trainees qualifying as consultants serving Sri Lanka as well as overseas.

She served as a member of the Board of study in Pathology at the Postgraduate Institute of Medicine University of Colombo, and contributed actively at revising the curriculum in Postgraduate training in Chemical Pathology as a member of the Board of Study.

She was a member of the Advisory Board for the training of Medical Laboratory Technologists and the Chief Examiner in Chemical Pathology at the Schools of Medical Laboratory Technology at Colombo, Kalutara and Peradeniya on numerous occasions.

She took a leading role in medical laboratory accreditation in Sri Lanka and her enthusiasm in accreditation paved the way for her to become a member of the Technical Advisory Committee of the Sri Lanka Accreditation Board for conformity assessment. In addition she served the Sri Lanka Accreditation Board , as a trainer and technical assessor in Chemical Pathology.

She worked hard towards the development of Chemical Pathology as a profession which led to the founding of the College of Chemical Pathologists of Sri Lanka in October 2015, for which she was unanimously appointed as the Founder President. The College had its first inaugural academic sessions in March 2016 and her endless efforts made this event a great success and it lead to a new era for the Chemical Pathology in SriLanka.

We salute her for all she did throughout her career to create a better day for the field of Chemical Pathology in Sri Lanka. Despite of her untimely demise in April last year, Dr. Meliyanthi Gunatillaka has created a permanent niche for herself in the annals of chemical pathology in Sri Lanka.

I am greatly honoured and privileged to read the citation of my beloved postgraduate trainer, late Dr. Meliyanthi Gunatillaka, Consultant Chemical Pathologist of yesteryear.

Ladies and Gentlemen, On behalf of the President and Council of the College of Chemical Pathologists of Sri Lanka, I would respectfully invite Dr. Nihal Gunatillaka to the podium, to accept the Fellowship conferred posthumously on Dr. Meliyanthi Gunatillaka by the College of Chemical Pathologists of Sri Lanka, in recognition of her valuable contribution to the field of Chemical Pathology in our country.

Dr. Brian Shine
MBBS, MD, MSc
Consultant Chemical Pathologist, Senior Lecturer
John Radcliffe Hospital, Oxford

It is a great honor and a privilege to read the citation of Dr. Brian Shine who is not only a teacher to me but an eminent Chemical Pathologist in UK, a dedicated academic and a researcher, a healthcare leader, and a popular mentor.

Dr. Shine qualified in Medicine from the University of Zimbabwe in 1974 with honours in Anatomy, Pathology, Pharmacology, Social Medicine and Medicine. He obtained his MRCPath in 1982 from Royal College of pathologists UK. During his stay at the Clinical Biochemistry department at St. Bartholomew's Hospital, London he did an MD on C-reactive protein. He obtained his FRCPath in 1994. He also holds an MSc in Applied Statistics and Operational Research from Birkbeck College, University of London.

Dr. Shine holds many positions in various respected committees and boards. He is a member, of the College Advisory Training Team of the Royal College of Pathologists since 2004, the Chair of the Laboratory Medicine IT Planning Group, Oxford Radcliffe Hospitals since 2003, a representative and a member of Royal College of Pathologists Manpower Committee, Royal College of Pathologists Representative for ACB Education Committee, a member of Royal College of Pathologists Modernising Scientific Careers Taskforce, and a member of National Institute for Health and Clinical Excellence (NICE) Technology Appraisal Committee. He holds membership of many societies including Royal Society of Medicine, Royal Statistical Society, British Medical Association, and American Association for Clinical Chemistry, Association of Clinical Biochemists, American Endocrine Society, and Society for Endocrinology, British Thyroid Society and Anglo-German Medical Society.

His current appointments include Consultant Chemical Pathologist and the Head of the Department of Clinical Biochemistry, Oxford Radcliffe Hospitals, Oxford, Consultant Chemical Pathologist in Horton General Hospital, Banbury, Honorary Consultant in Oxford Centre for Diabetes, Endocrinology and Metabolism, Honorary Consultant Chemical Pathologist in Stoke Mandeville Hospital, Aylesburyhonorary Senior Clinical Lecturer in the Nuffield Department of Clinical Laboratory Sciences and Lecturer at St Edmund College, University of Oxford.

His clinical interests are in Endocrinology which includes thyroid cancer, neuroendocrine tumours, renal stone disease, and electrolyte disorders. His research interests consist of thyroid carcinoma, diabetes, lipidology, health economics modeling and exploring service laboratory data. He has presented over 50 papers in peer-reviewed journals and many abstracts in international forums. He had delivered number of invited talks in many international forums too. He holds the prestigious post of referee for many high-impacts journals which include Clinical Chemistry, Annals of Clinical Biochemistry, Journal of Clinical Pathology, European Journal of Clinical Endocrinology and British Journal of Ophthalmology.

Its being unfair if I forget about his great passion for music specially opera and Lieder. He is married to Dr. Amanda Adler who is a diabetologist and a reasercher in Aden Brooks Hospital, Cambridge. In his busy schedule he somehow finds time to play squash. He is a brilliant squash player.

Dr. Shine is a compassionate clinician, a brilliant teacher, a far-sighted leader, enthusiastic researcher, an intelligent analyst and a sensitive human being. These great qualities have made him an empathetic mentor and a perfect guru for his trainees.

He started the ever-lasting partnership with the chemical pathologists of Sri Lanka in 2006 and has been generous by successfully training eight Sri Lankan trainees in Chemical Pathology under his supervision. Furthermore, he was humble to play the role of the external examiner for three MD chemical pathology examinations conducted by the Post Graduate Institute of Medicine, University of Colombo, Sri Lanka.

Ladies and gentlemen, on behalf of the President and the Council of the College of Chemical Pathologists of Sri Lanka, it is my great pleasure and honour to present Dr. Brian Shine for conferment of the Fellowship of the College of Chemical Pathologists of Sri Lanka in recognition of his valuable contribution to the College and to our country.

INTERNATIONAL FACULTY

Dr. Brian Shine
MBBS, MD, MSc
Consultant Chemical Pathologist, Senior Lecturer
John Radcliffe Hospital, Oxford

Dr. Brian Shine qualified in Medicine from the University of Zimbabwe in 1974. He trained in Chemical Pathology at St. Bartholomew's Hospital, London, where he did an MD on C-reactive protein. He holds an MSc in Applied Statistics and Operations Research from the University of London. He was a Senior Lecturer at the Institute of Ophthalmology and Moorfields Eye Hospital, and consultant at Stoke Mandeville Hospital. Current appointments include Consultant Chemical Pathologist in the Department of Clinical Biochemistry, Oxford Radcliffe Hospitals, Honorary Senior Clinical Lecturer in the Nuffield Department of Clinical Laboratory Sciences, Research Associate in the Diabetes Trials Unit, Consultant to Diabetes Trials Unit laboratory, and Chair of Oxford Research Ethics Committee A. His clinical interests are in Endocrinology and Diabetes, particularly lipids, thyroid disease, polycystic ovaries disease, and neuroendocrine tumours. Research interests include modelling reference intervals and quality assurance.

Dr. Yeo Chin Pin
MBBS, FRACPA, FAMS,
Consultant Chemical Pathologist
Head of Clinical Pathology, Division of Pathology
Singapore General Hospital, Singapore

Dr. Chin Pin attained her Bachelor of Medicine and Bachelor of Surgery degree from the National University of Singapore in 1994. She received training in Chemical Pathology at Singapore General Hospital, and attained her postgraduate degree in Chemical Pathology with the Royal College of Pathologists of Australasia in 2001. Dr. Chin Pin was admitted as a fellow of the Academy of Medicine of Singapore in 2003. Dr. Chin Pin is currently the Head of Department of Clinical Pathology in the Division of Pathology at Singapore General Hospital. The Department of Clinical Pathology hosts the Clinical Biochemistry Laboratory, Blood Bank, Satellite Laboratories and the Client and Specimen Management Unit.

Dr. Michael Patrick Metz
BS, MD, FAAP, MAACB, FRCPA
Consultant Chemical Pathologist,
Women's & Children's Hospital
North Adelaide, South Australia, Australia

Michael qualified in Medicine from University of Nebraska in 1978 . He trained in Pathology at Women's and Children's Hospital, North Adelaide and the Institute of Medical and Veterinary Science Adelaide. He has been a Clinical Senior Lecturer at the School of Paediatrics and Reproductive Health, University of Adelaide. He has more than twenty publications in National and International Journals. Current appointments include Consultant Chemical Pathologist in Women's & Children's Hospital, North Adelaide, Consultant Chemical Pathologist & Director of Clinical Chemistry in Clinpath Laboratories, Kent Town and Lipid Specialist in Metabolic Clinic, Genetics & Molecular Pathology SA Pathology at the WCH. He is a member of Advisory Board of FH Australasia Network, AACB/RCPA Patient Report Commenting Committee and the chair person of AACB/RCPA sweat testing working party. He is an assessor of AACB/RCPA sweat testing working party.

Professor Poornima Manjrekar
M.B.B.S, M.D.(Biochemistry), PhD
Professor& Head of the Department of Biochemistry
Kasturba Medical College
Mangalore

Poornima qualified in Medicine from Karnataka University, Dharwad. She had obtained MD in Pathology and PhD at Manipal University. She has been a professor and Head of the Department of Biochemistry at Kasturba Medical College, Mangalore. She has more than fifty publications in National and International Journals. Currently she works as the Chief Coordinator of MSc. Medical courses, Member of Composite Research Committee of the institution and Interdisciplinary research advisory group at Manipal University and a Convener of Faculty Research Forum, Kasturba Medical College, Mangalore. Her research areas include Diabetes and its complications, Thyroid Disorders and Obesity.

LOCAL FACULTY

Dr. Naomali Amarasena
MD, FRCP(Lond), FCCP, FRACP(Hon)
Consultant Cardiologist
Sri Jayewardenapura General Hospital

Dr. B. K. T. P. Dayanath
MBBS, D. Path, MD (Chem. Path), MAACB
Consultant Chemical Pathologist
North Colombo Teaching Hospital
Ragama

Dr. Roshitha de Silva
MBBS, D. Path, MD (Chem. Path)
Consultant Chemical Pathologist
Senior Lecturer, Department of Pathology
Faculty of Medicine, University of Kelaniya, Ragama

Dr. Manjula Dissanayake
MBBS-Colombo, D.Path, MD (Chemical Pathology)
Consultant Chemical Pathologist
Teaching Hospital Karapitiya

Dr. Lakmini Ginige
MBBS, D. Path, MD (Chem. Path)
Acting Consultant Chemical Pathologist
Sirimavo Bandaranayeke Specialised Children's Hospital, Peradeniya

Dr. Lallindra Gooneratne
MBBS, D. Path, MD (Haematology), FRCPath (UK)
Consultant Hematologist
Senior Lecturer in Pathology, Faculty of Medicine,
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SPEAKER ABSTRACTS

Common Acid Base Disorders

Dr. Thushara Hewageegana

Blood gas analysis is the key for the diagnosis of acid base disorders. A careful interpretation of the blood gas report will give a clue on the existing primary acid base disorder, compensation if any, and whether the derangement is acute or chronic. The oxygen status indicates how much oxygen is in the blood and whether is it adequate for the patient during the prevailing acid base derangement. Additional information like anion gap and delta gap help to further narrow down the acid base disorder and to identify the underlying cause and treat the patient.

Approach to Hypokalemia

Dr. Kisali Hirimutugoda

Hypokalemia (serum potassium <3.5 mmol/L) is one of the most commonly encountered fluid and electrolyte abnormality in clinical practice. Symptoms of hypokalemia correlate with the serum potassium level and the rapidity of the decrease in serum potassium. It can be asymptomatic finding identified only on routine electrolyte screening or it can be associated with symptoms ranging from mild weakness to sudden death.

Hypokalemia can be associated with normal or decrease total body potassium content. Normal body potassium with hypokalemia is a result of potassium redistribution from the extracellular to the intracellular compartment. Total body potassium depletion can result from either inadequate potassium intake or excessive potassium loss and the loss may be renal or extrarenal (gut and skin).

Several drugs like β-adrenergic agonists, theophylline, verapamil intoxication, chloroquine intoxication, barium intoxication and exogenous Insulin and conditions like alkalosis, hypothermia, hypokalemic periodic paralysis, therapy of megaloblastic anaemia and pseudohypokalemia due to significant leukocytosis can induce hypokalemia due to potassium redistribution.

Renal potassium loss may be due to diuretics (thiazide, loop and osmotic), antibiotics (penicillin, amphotericin B toxicity, aminoglycosides), hormones (mineralocorticoid excess, glucocorticoid excess), bicarbonaturia (distal renal tubular acidosis, tratement of proximxl renal tubular acidosis) intrinsic renal transport defects (Barttter's, Gitelman's and Liddle's syndrome) and hypomagnesemia.

The cause of hypokalemia is usually apparent from the history. If the cause is uncertain assessment of urinary potassium excretion and acid-base status can be used as an initial step in the diagnosis of hypokalemia.

Assessment of urinary potassium excretion is best accomplished by measuring potassium excretion in a 24-hour urine collection. Measurement of the potassium and creatinine concentrations in spot urine is an alternative if collection of a 24-hour urine is impractical. Subsequent evaluations such as measurement of spot urinary chloride, serum aldosterone, renin and cortisol levels may be needed in certain circumstances.

Biochemical Changes in Chronic Kidney Disease

Dr. Roshitha de Silva

Changes in the body seen in chronic renal failure are complex and multifactorial. In CKD Many metabolic products are retained in the body and some products have direct effects on the acid base balance and cellular metabolism. The alterations in cellular metabolism are reflected in disturbances of lipid, protein, carbohydrate, and steroid metabolism. Important alterations are seen in the electrolyte and water balance. Many hormonal changes are also observed and parathyroid hormone and Vitamin D cause changes in serum calcium, phosphate and magnesium.

Management of CKD

Dr. A.L.M Nazar

CKD has become a major health burden in Sri Lanka due to increasing incidence of Diabetes in the country and endemic CKDu among the farming community in the North Central province. Management of CKD requires a unreasonably higher health budget allocation and a third world country like Sri Lanka cannot fulfil the requirement of all patients. Early detection and appropriate management is the key to delay the progression towards end stage renal failure. This lecture will focus on current management strategies in CKD and resource management strategies in Renal replacement therapy.

Enzymatic Creatinine Assay

Dr. B. K. T. P. Dayanath

Accurate serum creatinine measurements in glomerular filtration rate estimation (eGFR) using equations are critical in staging and management chronic kidney disease (CKD). The creatinine standardization programme was created by National Kidney Disease Education programme (NKDEP) laboratory working group in collaboration with International Federation for Clinical Chemistry & Laboratory Medicine (IFCC) and European Federation of Clinical Chemistry and laboratory medicine to reduce inter laboratory variation in creatinine assay calibration and therefore enable more accurate results of eGFR.

Standardization of calibration i.e. implementation of calibration traceability to high order reference measurements procedure and reference materials does not correct for analytical interferences of field methods. Currently available Alkaline Picrate based Jaffe methods and its modifications are the mostly used assays. Although creatinine measurement procedures traceable to IDMS, correction for analytical interferences due to various non-creatinine chromogenic interferences of individual samples could not be overcome. Reactivity of non- creatinine chromogenic interference varies from individual to individual. The use of an assay more specific for serum creatinine determination employing enzymatic reactions provide more reliable creatinine & eGFR values overcoming above

interferences. The enzymatic assays deal efficiently with most interfering substances but has a relatively higher cost. However we have to consider cost benefit ratio in order to get more specific and accurate creatinine & eGFR results when staging of eGFR matters in a country like Sri Lanka where prevalence of CKD is high.

Adventures with Electrolytes

Dr. Brian Shine

Disorders of mineral metabolism are common and can be very difficult to disentangle. Clinical Biochemistry practitioners are often asked to try to come to a diagnosis, when other physician groups have failed. Taking a good history and trying to identify other affected family members help to make a presumptive diagnosis, and to direct genetic testing to confirm these. I will give examples of disorders of potassium, magnesium and calcium metabolic disorders in which it was possible to come to a diagnosis, sometimes after years of investigation. We have also seen a number of people who have been labelled as having hypokalaemia, which appears to be an artefact due to the storage conditions of the specimen before analysis. We are currently evaluating these people to see how frequent the disorder is and find the possible causes.

Screening and Risk Stratification for Primary Prevention of CAD

Dr. Naomali Amarasena

Primary prevention reduces MI and heart failure, decreases the need for coronary revascularization procedures and extends and improves the quality of life. A 2010 report on cardiovascular risk assessment in asymptomatic adults, recommends obtaining global risk score and a family history of cardiovascular disease for cardiovascular risk assessment. A risk factor is a parameter that is predictive of a future cardiovascular event and are broadly divided into 3 categories: namely non modifiable (eg. age), modifiable (smoking) and emerging risk factors (CRP). Considerable clinical benefit can be derived from the management of 3 major modifiable risk factors: hypercholesterolemia, hypertension and cigarette smoking. The addition of Coronary Artery Calcium scanning to the conventional risk factor modification has been associated with superior coronary artery disease risk factor control without increasing downstream medical testing. In 2015 the American College of Physicians released guidelines on screening for coronary heart disease. This included the lack of evidence that cardiac screening improves patient outcomes in asymptomatic, low-risk adults and potential harms include false-positive results causing patients to undergo potentially unnecessary tests and procedures. Thus clinicians should emphasize strategies to reduce cardiovascular risk even further among low-risk adults by treating modifiable risk factors. Regardless of the patient's age, clinicians should communicate risk data to the patient and refer to the ACC/AHA lifestyle guidelines which cover diet and physical activity. For patients with elevated 10-year risk, clinicians should communicate risk data and refer to the guidelines on blood cholesterol and obesity. However while guidelines represent best practice, their formulation is often a blend of science and art. Therefor guideline interpretation should always occur alongside good clinical judgement.

Cardiac Biomarkers

Dr. Chandrika Meegama

The definition of a biomarker as “a characteristic that is objectively measured and quantified as an indicator of normal biological processes, pathogenic processes, or pharmacologic responses to a therapeutic intervention” was standardized by the National Institute of Health (NIH) working group in 2001.

Cardiac biomarkers play a pivotal role in the risk stratification, diagnosis and treatment of patients with chest pain and suspected acute coronary syndrome. Elevated cardiac biomarker is an essential criterion in the new definition of acute myocardial infarction according to the guidelines of American College of Cardiology and the European Society of Cardiology.

In the past, several cardiac markers namely, CK, CK-MB, CK-MB isoforms, troponins and myoglobin were used in the diagnosis and management of cardiovascular disease. However, lack of sensitivity and specificity for cardiac muscle necrosis fuelled continued research. Exciting advances in the field of cardiac biomarkers used in the management of patients with acute coronary syndrome seen in the last decade. Biomarker research has broadened our knowledge base, shedding more light on the underlying pathophysiological mechanisms occurring in patients.

The criteria required by an ideal cardiovascular biomarker has been progressively changing in the present era of sensitive assays that can be used to guide treatment. Recent technological advances have made it possible to rapidly measure even minute amounts of these proteins by means of higher sensitivity assays.

At present, troponins are the biochemical “gold standard” for the diagnosis of acute myocardial infarction according to the consensus guidelines of ESC/ACC. Recent multi centric studies have shown that high sensitive troponin assays improve the early diagnosis of AMI.

Although there are many emerging cardiac markers such as B-type natriuretic peptide (BNP) , C-reactive protein (CRP), Myeloperoxidase(MPO), Ischaemia modified albumin (IMA), most of them need further studies for increasing diagnostic sensitivity and specificity for improving prognostic capability of acute coronary syndrome.

Inherited Lipid Disorders

Dr. Michael Metz

In Australia as in Sri Lanka atherosclerotic heart disease is a leading cause of death. There is a known correlation of cholesterol concentrations to likelihood of heart disease. Dyslipidaemia are inherited and acquired. The best known simply inherited disorder of cholesterol metabolism associated with increased atherosclerotic heart disease risk is familial hypercholesterolemia. Much work has been done in the last few years in regard to familial hypercholesterolemia. However as we learn more about the genetics of FH, the genetics of monoclonal hypercholesterolemia, we are learning more about the genetics of polyclonal hypercholesterolemia. In addition to atherosclerosis associated with hypercholesterolemia it is now recognized that increases in triglyceride concentration are associated with atherosclerotic heart disease. Of course the genetics of hypertriglyceridemia can be simple or complex.

This presentation will be an exploration of the genetics of dyslipidaemia, their manifestations, their investigations, and their management.

Assessment of Nutritional Status

Dr. Ranil Jayawardena

Empirical evidence shows that poor nutritional status is associated with negative health outcomes. Adverse consequences of malnutrition can be varied: longer periods of hospital stay, increased morbidity and mortality of patients and increased health expenditure for the state. Despite current advancements in understanding the value of proper nutritional care, the malnutrition is yet highly prevalent among hospitalized patients, ranging from 30% to 50% and Sri Lanka is not in exemption. A recent study shows very prevalence of malnutrition among cardiac patient in Sri Lanka and malnutrition is associated with poor patient outcome. However, the prevalence may depend on the patient population and the criteria used for diagnosis, which is often unrecognized and underestimated by health care workers. Early identification of the individuals who are already malnourished or at the risk of malnutrition and intervening their dietary requirements at an initial stage will improve patients' overall prognosis and will reduce the state health care costs.

Assessment of nutritional status is a comprehensive process (A to F) that combines several components including Anthropometric measurements, Biochemical parameters, Clinical judgment, Dietary details, Emotional and Functional assessments. In my presentation, I will mainly focus on the biochemical assessment of the nutritional status. Evaluating nutritional status using biochemical methods is a more objective oriented and precise approach. However, the laboratory investigations will not cover all the aspects of the nutritional status. Biochemical methods are widely used to determine nutritional deficiencies and these procedures are especially applied in identifying the marginal deficiencies where dietary data and clinical features are unconvincing. This permits the initiation of appropriate management before overt clinical signs or diseases appear. On the other hand, biochemical tests are broadly used to assess the health status of patients who are suffering from over nutrition issues such as obesity, diabetes and cardiovascular diseases.

Functioning Pituitary Tumours

Dr. Noel P Somasundaram

An endocrinologist is the primary carer for a patient with pituitary tumour. The general principles involved in evaluation and treatment of the patient includes evaluation of the tumour itself for the extent, type of lesion, the structural effects and the hormonal effects (overproduction or underproduction) and to make a decision on the management plan. Specialized tests may be necessary to ascertain that the tumour is a functioning one e.g. TRH test.

The next step that is usually taken is correction of the hormonal milieu of the patient which may involve replacement or suppression of overproduction. The various strategies will be discussed in the lecture

Some of the lesions are medically treated (e.g prolcatinomas with dopamine agonists, Acromegaly with somatostatin analogues or GH receptor antagonist) and a brief discussion on the various strategies will be made during the lecture. A case based approach will be used to discuss the functioning tumours arising from the pituitary.

Neuroendocrine Tumour Markers

Dr. Rajitha Samarasinghe

Neuroendocrine tumours (NET) arise from organs secreting neuroendocrine messengers. As a group has a higher incidence.

Two groups of markers are available.

1. Broad spectrum or general and
2. Specific, markers

As the presentation is late, the specificity and sensitivity of these markers should be very high.

General markers, Chromogranins – A family of neuroendocrine secretory proteins of adrenal medulla and pancreas.

Chromogranin A (CgA) is the most utilised marker in neuroendocrine tumours of adrenal medulla, GI tract and in carcinoid syndrome with a high degree of specificity and sensitivity.

Interpretation of CgA had to be done with caution as elevation possible with physiological, other non malignant conditions and with certain drug therapy like proton pump inhibitors.

Other general markers in use are pancreatic polypeptide and neuron specific enolase.

Specific markers – Specific markers are for different functioning NETs.

Widely used specific markers are ACTH, ADH, Serotonin, 5 HIAA, Gastrin, C peptides and calcitonin

Diagnosis of Cushing's Syndrome

Dr. Manilka Sumanatilleke

Cushing's syndrome is caused by exposure of tissues to inappropriately high levels of glucocorticoids for a prolonged period of time.

The most common cause is iatrogenic due to the use of steroids (oral, inhaled and topical) prescribed for many types of diseases for which it may be an essential or a life saving medication.

Endogenous Cushing's syndrome is a rare condition with an incidence of 2-3 cases per million population per year. It can be broadly classified as ACTH dependent or independent where the excess cortisol production is driven by excess ACTH from the pituitary (or very rarely from an ectopic site) and endogenous adrenal production of cortisol.

Cushing's syndrome can vary in severity and presentation with a plethora of different symptoms and signs which can be very characteristic for the condition or it could be very subtle with symptoms or signs commonly seen in the general population. The symptoms are usually progressive.

Proximal myopathy, unexplained osteoporosis, thin skin, easy bruising and reddish purple atrophic striae have a more discriminatory value compared to obesity, depression, diabetes mellitus, hypertension, menstrual irregularity and hirsutism. Clustering of these symptoms and signs should arouse a suspicion.

It will be difficult to miss the diagnosis in it's most florid form: a plethoric person having a 'lemon on stick' (central obesity) appearance with most of the classical signs but the subtle forms can vex even a very experienced Endocrinologist!

Multitude of investigations, both biochemical and radiological would be needed to decipher a proper diagnosis from the fairly long list of differential diagnoses and careful interpretation of the tests (executed under ideal conditions) should be done to come to a firm diagnosis.

The majority (~90%) of Cushing's Syndrome is due to an ACTH secreting micro-adenoma of the pituitary.

The common screening tests are mid night serum or salivary cortisol, 24 hour urinary free cortisol and Over Night Dexamethasone Suppression Test (ODST).

These adenomas usually retain some responsiveness to the usual feedback mechanisms and this forms the basis of different suppression (Dexamethsone) and stimulatory tests (CRH, Desmopressin and Insulin Tolerance Test).

ACTH and Inferior Petrosal Sinus Sampling (IPSS) are useful in identifying the underlying cause once the diagnosis of the syndrome is established.

To make matters worse an overlap of symptoms and signs of Cushing's syndrome can occur with associated deranged Hypothalomo-pituitary-adrenal axis resulting in Pseudo-Cushing's syndrome. Certain psychiatric conditions such as depression, anxiety disorders and obsessive compulsive disorders are common causes of this phenomenon in addition to poorly controlled diabetes mellitus

and alcoholism.

Some cases of ACTH-dependent Cushing's syndrome occur in a periodic or cyclical form, with intermittent and variable cortisol secretion, the symptoms and signs waxing and waning according to the active periods of the disease (Cyclical Cushing's). These patients particularly can cause diagnostic difficulties as it is imperative that the diagnostic tests are performed during the periods of hypercortisolaemia when clinical symptoms worsen.

A 'HbA1c ' for Cortisol is a need of the hour and a recent study measuring proximal (1cm) hair cortisol levels have shown promising correlation with standard tests. 'Food for thought' for the Chemical Pathologists!

(Hodes A ,et al "Hair cortisol in the evaluation of Cushing Syndrome" Endocrine Intl J Basic Clin Endocrinol 2017;DOI: 10.1007/s12020-017-1231-7.)

Providing Interpretive Comments to Laboratory Results for the Benefit of Test Requesters

Dr. Michael Metz

Now that we measure things pretty well, the next step will be to improve the use of these measurements. The expertise of chemical pathology has grown beyond simply measuring analytes in tissues. As more tests are available to more requesters our expertise in interpreting these tests is more apparent. To share this expertise, to improve the use of these results by interpretive comments associated with results are being increasingly used. Along with lectures to groups and one-on-one discussions, patient report comments are recognized as a way to share knowledge. Improved information technology helps us to deal with the increasing number of tests and the need to disseminate knowledge regarding the interpretation of these tests. There are moves afoot to harmonize interpretive comments to optimize patient outcomes.

Laboratory Assay Performance Parameters

Dr. Yeo Chin Pin

Two questions are often asked: Does the laboratory test result suggest a pathological condition? Does the numerical difference between two laboratory results indicate a change in the patient's clinical condition? Pre-analytical, analytical and post-analytical variables affect laboratory results and contribute to changes in laboratory results; and should be given due consideration during the process of interpreting laboratory results.

Overview of Osteoporosis, Present Situation and Future Perspective

Prof. Sarath Lekamwasam

Osteoporosis, the most prevalent metabolic bone disease predominantly affecting postmenopausal women, has become a serious health concern today. Osteoporosis is clinically silent in most cases and fragility fracture is the sinister clinical end result. Chronic back pain and kyphosis are the other recognized clinical manifestations.

Of many possible etiologies, age and gonadal hormone deficiency are the key factors contributing to the disease. Among diseases linked with osteoporosis, inflammatory bowel disease, malabsorption and inflammatory arthritis are common associations. Prolonged (>3months) systemic use of corticosteroids leads to osteoporosis and fractures.

Although fracture at any site can be attributed to osteoporosis, hip, spine, ribs and forearm are the typical sites linked with the disease. Of these, hip fracture is the most sinister fracture type due to the higher mortality, morbidity and health care cost involved. Nearly 50% of hip fracture survivors at 12 months post-fracture become dependent on others for their daily activities. Scientists have predicted more hip fractures in years to come but most countries have no proper strategies in place to meet this challenge.

Bone Markers

Dr. Saman Peduru Hewa

Dynamicity of bones not only incite clinicians to search for way to comprehend processes but it also provides the science an opportunity to explore for markers of changing dynamics of this active tissue in physiological and in pathological states. Indicators that have already been identified offer some insight into the type and the degree of ongoing activities within the bone. Although the range vary from commonly used, easily analysed, traditional markers to intermediates and by-products of complex metabolic interactivity which need state of the art technology for detection the usefulness of them still appears to be limited. Out of many metabolic functions of bones most of markers reflect the activity level of bone resorption and bone formation. However, certain significant advances have already been made in treatment of patients with bone diseases with the use of those indicators and it is obvious that better understanding of bone markers and their relatedness to metabolism is a requirement for wider applications of those newly established treatment modalities.

PREDIABETES - A Contentious Entity?

Prof. Poornima Manjrekar

Type 2 Diabetes mellitus, is a global epidemic of modern times afflicting upward of 422 million. The developing countries, particularly South Asian countries are worst affected. 'Prediabetes' defined by American Diabetes Association & other related consortiums refers to the plasma glucose levels above the normal threshold but below the clinical diabetes levels.

Several epidemiological studies have shown the prevalence of prediabetes to be at a much larger proportion than diabetes & this is of great concern as majority of the individuals may remain ignorant of the condition. The revelation that 20-50% of the patients present with complications at the time of diagnosis of diabetes, prompted robust study of the pathophysiology of diabetes before the onset of clinical diabetes. The research in the past decade reveals that several metabolo-systemic alternations pertaining to type 2 diabetes indeed can be demonstrated in the prediabetes phase or still earlier as seen in longitudinal studies involving susceptible populations like the first degree relatives.

The mild dysglycemia of prediabetes is sufficient to invoke the insulin resistance or vice versa, trigger inflammatory pathways, originate free radicals and activate the pathways involved in tissue damage. It is disheartening to know that these mechanisms have been observed with intermittent spurts of hyperglycemia even when the fasting & post prandial glucose measures are maintained within the acceptable limits.

In most cases of prediabetes, life style modification is the mainstay approach, failing which Metformin is the drug of choice. Despite efforts, the rate of conversion to type 2 diabetes is high, especially when associated with other risk factors like obesity, hypertension, dyslipidemia & family history.

With the enormous evidence that pathology of diabetes & its associated complications begin in the prediabetes phase (or even earlier?) it is probably time to reflect on the cut off values for normal glucose levels & those for diabetes. Does it make sense to have only the normal & the abnormal & do away with the grey area- 'PREDIABETES'?

Optimizing Diabetes care – Role of Guidelines and Laboratory

Dr. Prasad Katulanda

Over the years management of diabetes has evolved to focus more on evidence based interventions to reduce mortality and morbidity from symptomatic treatment to reduce osmotic symptoms . The United Kingdom Prospective Diabetes Study (UKPDS) for type 2 diabetes and Diabetes Complications and Control Trial (DCCT) for type 1 diabetes were the two landmark studies that led to this change.

Many new therapies have been introduced for glycaemic control. The guidelines, which are updated on an annual basis, are mostly based on well-conducted randomized controlled clinical trials. To reduce the confusion the main professional organizations like the American Diabetes Association (ADA) and the European Association for Study of Diabetes (EASD) have got together in formulation guidelines.

Based on these guidelines the clinicians can now take evidence-based decisions in deciding the therapies for glycemic control. Unlike in the past the present guidelines encourage patient centered approaches in management. In addition the guidelines provides directions for blood pressure control, lipid-lowering therapy, antiplatelet therapy and many other non-glycaemic therapies.

The biochemistry lab now plays a pivotal role in determining diabetes management. Many years ago diabetes diagnosis changed from clinical presentation to biochemical tests. In addition to blood glucose the glycosylated haemoglobin (HbA1c) is used for diagnosis of both pre-diabetes and diabetes. Most outcome studies have used HbA1c in predicating microvascular and macrovascular complications. To ensure quality of HbA1c assays and for comparability across laboratories, the National Glycohemoglobin Standardization programme (NGSP) and International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) have taken vital steps in harmonizing different methods.

Diabetes nephropathy is mainly diagnosed based on urinary protein excretion and renal function tests. Microalbuminurea is used to identify nephropathy at very early and reversible stage. Urinary albumin creatinine ratio (ACR) is increasingly used to increase the accuracy of microalbuminurea. Estimated Glomerular Filtration Rate (EGFR) using different formulae has largely replaced the cumbersome creatinine clearance tests as the indicator of renal function. Traditional lipid profile tests, small dense LDL (sdLDL), high sensitive CRP (hsCRP), adiponectin and many other tests are being used both at clinical and research settings for prediction of cardiovascular risk and selection of appropriate therapies in diabetes dyslipidemia.

For comprehensive and multidisciplinary diabetes care, the chemical pathology laboratory and the guidelines have become enormously helpful to the busy clinicians who wants to take individualized patient centered decisions based on the best available evidence.

Gestational Diabetes Mellitus

Dr. Deepani Siriwardena

Gestational diabetes mellitus (GDM) is defined as hyperglycemia detected in pregnancy which is not attributable to either type 1 or type 2 diabetes mellitus (DM) and more likely to occur after 24 weeks. This differs from diabetes in pregnancy (DIP) which is either type 1 or type 2 DM complicating pregnancy, which could have been previously diagnosed or first comes to light in pregnancy. Hyperglycemia in pregnancy (HIP) which includes both DIP and GDM is associated with a multitude of maternal and foetal adverse outcomes, thus calling for timely intervention in the diagnosis and management by the health care delivery team.

The best strategy for the screening and diagnosis of GDM is still evolving. The standardization of the screening strategy and the diagnostic tests would ensure uniformity in the management and expected outcomes. The International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria proposed in 2010 based on the Hyperglycamia and Adverse Pregnancy Outcome (HAPO) study recommends a fasting 75 g oral glucose tolerance test at 24 – 28 weeks. This forms the basis for the current World Health Organization (2013) criteria and has been adopted by many countries worldwide, with or without modifications.

The clinical guideline of the Sri Lanka College of Obstetricians and Gynaecologists (2014) recommends screening of all mothers at the first antenatal visit using a non-fasting 75 g glucose challenge test (GCT). A venous plasma glucose value at 2 hours in the GCT ≥7.8 mmol/L confirms GDM. A negative screen needs follow up at 24 -28 weeks with repeat testing.

"Is this recommendation evidence based? Has it been universally adopted by maternal care givers in the country?" need answers.

Management of Multiple Myeloma

Dr. Lallindra Gooneratne

The diagnosis and management of myeloma requires the performance and interpretation of a number of tests in the biochemistry laboratory. Investigations such as serum and urine protein electrophoresis, immunofixation and serum free light chain assays are invaluable tools for both the diagnosis and monitoring the response to treatment. The International prognostic index (IPI) is dependent on serum albumin and beta 2 microglobulin levels and more recently serum LDH has been included in the calculation of the prognostic score; Revised International Scoring System (R-ISS). Hypercalcemia and impaired renal function are considered independent indications to start treatment in myeloma. The flood of new anti-myeloma agents into the arena, such as monoclonal antibodies has increased the demand for the development of newer laboratory tests. This highlights the role of the chemical pathologist in the team managing patients with myeloma.

Reference Intervals in Children

Dr. Michael Metz

It is a shame when we go to great effort to produce good laboratory results but leave the clinicians to misinterpret those results for lack of useful reference intervals. Likewise it is disappointing to fail to identify pathology or to instigate investigations where no pathology exists due to poor reference intervals.

Reference intervals are critical to the interpretation of any of the results that we issue from the clinical chemistry laboratory. This discussion will focus on providing useful reference intervals for the paediatric population. The discussion will present reference intervals for a number of analytes. Sources to obtain useful reference intervals will be described. Techniques that can be helpful in developing one's own children's reference intervals will be described. Biological variation of common chemistry analytes in childhood will be presented.

Thyroid Testing Strategies

Dr. Brian Shine

There is controversy about whether TSH is an adequate front line test for primary care, or whether some measure of thyroid hormone production (e.g., free thyroxine-FT4) is also required. The rationale for including FT4 is that a proportion of people undergoing thyroid function tests will have hypothyroidism due to pituitary disease (that is, secondary hypothyroidism), and that these will be missed if only a TSH is performed, since, in this situation, the usual inverse relationship between TSH and FT4 is absent. This is an attractive argument, because of the harm or costs of delayed diagnosis, such as avoided deaths, and improved quality of life. However, the costs associated with this policy may be greater than society is prepared to pay. We have examined this and find that the main variables to be taken into account include the cost of the test, the incidence of hypothyroidism due to pituitary disease, and the deaths avoided. It is not clear that this is a good use of public money in the United Kingdom context.

Updates on Vitamin B 12 Deficiency

Dr. Manjula Dissanayake

B 12 is a water soluble vitamin present in meat, sea food, milk and dairy products. 2-5 mg of vitamin B 12 is stored in our body and approximately 50 % is stored in the liver. It takes many years to deplete these stores without intake. Nutritional deficiency, increased requirement, malabsorption, medication are common causes of B 12 deficiency. Impaired methylation as a result of vitamin B 12 deficiency results in megaloblastic anaemia and neuropathy.

In the stomach Vit B12- intrinsic factor complex is formed and transported to ileum. The absorption in to blood happens in the ileum. This B 12 is bound to haptocorrin (75%) and holo transcobalamin (25%) in the circulation. Transcobalamin is the physiologically active form. The function of haptocorrin is unknown.

Total B12 is influenced by changes in binding proteins and a poor indicator of bioavailable holo trancobalmin. It is evident that holo trancobalamin has better sensitivity and specificity for assessing B 12 status as it is not affected by hatocorrin levels. Holo transcobalamin is not yet used as a first line test due to limited availability and high cost. Current strategy of using both total B 12 and holo transcobalamin in the low or equivocal range improves diagnostic accuracy of vitamin B 12 deficiency.

Cost Effectiveness in Laboratory

Dr. Brian Shine

The amount of money that a society can spend on healthcare is always limited. This means that not everything that is desirable can be funded. Any new intervention must be both clinically and cost effective. Clinical effectiveness means that the technology increases the length and/or quality of life. Cost effectiveness analysis allows us to calculate what we should pay for this gain. One way is to divide the increase in cost by the gain in clinical effectiveness, measured in quality adjusted life years (QALYs). This yields the incremental cost effectiveness ratio (ICER), which can be used to compare different technologies and decide which ones should be funded. I will show how this applies in the general case, and will use some laboratory examples to show how this can be applied to investigations.

Clinical Governance and Chemical Pathology

Dr. Gayani Weerasinghe

Clinical governance is a system for improving the standards of clinical practice. It aims to shift the performance of all health organisations closer to the standards of the best.

There are varying facets of it, which broadly include quality improvement activities, identification and management of risk, personal accountability, clinical effectiveness and staff and organisational development.

Quality improvement includes, internal and external quality control schemes, which we have been following for many years. Laboratory accreditation also plays a major role. Clinical audit process helps to ensure good practice and the evaluation of innovations and ideas.

Transparent complaint procedure is one of the most important building blocks. We need to learn from lessons to reduce reoccurrences. Clear line of responsibility and accountability are central in providing a good quality service. Clinical risk management involves patients and workspace based safety.

Staff and organisation development is crucial to the delivery of standard pathology services. Good staff recruitment, retention, training and development with continuous professional development, annual appraisals and clinical revalidation are some of the aspects included.

To keep everything perfect a sound clinical leadership and a positive supportive organisational culture is essential.

As pathologists where do we stand and what should we do about clinical governance?

Use of Automation and Information Technology to Enhance Quality of Laboratory Results and Efficiency of Laboratory Operations

Dr. Yeo Chin Pin

Laboratory automation should be implemented as part of a continuous quality and process improvement plan; and include both the incorporation of automation hardware (automated analysers and possibly a track/conveyor system linking pre-analytical, analytical and post-analytical phases) and automation software (information technology that links the analysers and track system to the laboratory information system and hospital electronic medical records); in order to attain maximum benefits. Careful considerations for workflow in general and that of stat/urgent specimens in particular, infrastructural design and staff training and mentality will also contribute significantly to the success. We share our laboratory's journey in process reengineering and introduction of a laboratory automation system as part of our move into a purpose-built facility.

CASE REPORTS

CR1 Pseudo-Bartter Syndrome in a Patient with Cystic Fibrosis: A Challenge in Diagnosis

Dilanthi HW[1], Vidanapathirana DM[1], Jayasena KLSPKM[1], Chandrasiri NDPD[1], Piumika UMT[1], Wickramarathne DKN[1], Jasinge EA[1], Mendis D[2], Kennedy H[3], George P[3], Florkowski C[3]

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Introduction
The syndrome of metabolic alkalosis, with low serum electrolyte concentrations (hyponatraemia, hypokalaemia and hypochloraemia), known as Pseudo-Bartter syndrome (PBS) is a recognized initial presentation of cystic fibrosis (CF). We report a patient with genetically confirmed CF who initially presented with PBS.

Presenting concerns of the patient and clinical findings
A 3-month-old male infant, from non-consanguineous parents presented with diarrhoea and vomiting and was found to have hyponatraemia, hypokalaemia, hypochloraemia and metabolic alkalosis. He had persistent hypercalciuria though serum calcium, magnesium and urine sodium were normal. He was initially assigned as Bartter syndrome. He also had recurrent respiratory tract infections (RTI) from 6 months of age, failure to thrive (FTT) and steatorrhoea. He also underwent cholecystectomy. His 3-year-old brother also had recurrent RTI and FTT.

Diagnostic Focus and Assessment
Computerized tomography of the chest revealed right upper lobe bronchiectasis. Sweat chloride concentration of the patient and sibling (analysed by chloride meter) were 96 and 81mmol/L respectively (>60mmol/L – High). Cystic fibrosis trans membrane conductance regulator (CFTR) genotyping undertaken in India showed absence of common mutations including dF08 found in Indian children, although full sequencing of the CFTR gene done in New Zealand revealed three gene variants (heterozygous c.53+1G>C, heterozygous c.1282C>G, heterozygous c.2738A>G) in both siblings. Father was heterozygous for the likely pathogenic c.53+1G>C variant and mother heterozygous for c.1282C>G and c.2738A>G, the latter of which is known to be pathogenic.

Discussion
The diagnosis of CF should be considered when a patient presents with electrolyte imbalance and metabolic alkalosis.

CR2

A Fatal Case of Neonatal Hypercalcaemia

Abeynayake GPN, Jasinge E

Department of Biochemistry, Lady Ridgeway Hospital for Children, Colombo 8

Introduction

Neonatal severe primary hyperparathyroidism (NSHPT) is a rare disorder caused by homozygous inactivating mutations in the Calcium Sensing Receptor (CaSR) gene resulting altered calcium metabolism. It leads to nephrocalcinosis, bone demineralization and neurological disabilities. Surgery is the treatment of choice. While waiting for surgery bisphophonates can be used as an alternative to correct hypercalcaemia.

We report a case of neonatal severe primary hyperparathyroidism due to a novel CaSR gene mutation that presented with respiratory distress and severe hypercalcaemia.

Case overview

A female neonate was admitted at one month of age for suspected respiratory distress due to aspiration pneumonia. Laboratory testing revealed severe hypercalcaemia, elevated intact parathyroid hormone (iPTH), hypophosphataemia, increased ALP and low fractional excretion of calcium (0.01). Radiographs demonstrated generalized osteopaenia. Ultra-sound scan of neck did not reveal parathyroid gland abnormality. Patient could not undergo Tetrafosmin/Sestamibi scanning as her condition deteriorated. Treatment was initiated with pamidronate at a later stage (after one month of investigations) which reduced serum calcium level. Despite intensive treatment baby expired after one month stay of hospital. A CaSR gene mutation study showed a novel homozygous terminator mutation in exon 4: 78533 C>T,227R>X . Family screening could not be performed due to unwillingness.

Discussion

This neonate with respiratory distress, osteopaenia, severe hypercalcaemia and hyperparathyroidism was found to have a novel homozygous mutation of CaSR gene consistent with the diagnosis of neonatal severe hyperparathyroidism. NSHPT is a life threatening condition which should be identified early and treated promptly and for that there should be a high index of suspicion.

CR3

Molar Pregnancy with Negative Urine β-hCG

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Introduction
Urine β-hCG (beta human chorionic gonadotrophin) test is widely used as the first screening test for patients of reproductive age presenting with amenorrhoea. We report a case of molar pregnancy with multiple false negative urine β-hCG tests.

Presenting concerns of the patient and clinical findings
A 30-year-old lady admitted for further management following an ultra sound scan done for lower abdominal distention for one month duration. She was pale and had a 20-week sized uterus and adenexal tenderness.

Diagnostic Focus and Assessment
The ultra sound scan findings were suggestive of gestational trophoblastic disease. Urine was tested for β-hCG and it was negative! After multiple dilutions, blood sample revealed β-hCG level of 2.2 mIU/L. Urine β hCG test was performed after dilution of urine 1:10 and the result showed weak positivity and further dilution of urine 1:100 gave strongly positive result.

Discussion
Current urine pregnancy test use antibodies directed against β-hCG and most of them are sandwich immunoassays. When β-hCG is present it is immobilized by a capture antibody and labeled by tracer antibody resulting in an immobilized antibody β-hCG tracer sandwitch. When β-hCG levels are high, both the capture and the tracer antibodies saturate with β-hCG thereby preventing the formation of sandwich and ended up with low tracer signal and low β-hCG results. This is known as the “Hook effect”.

Clinicians need to be aware that the qualitative β-hCG assays may be falsely negative with extremely elevated serum levels due to the high-dose hook effect and when suspicion exists for molar pregnancy quantitative β-hCG levels are necessary to exclude the diagnosis.

CR4 Dubin Johnson Syndrome and Intrahepatic Cholestasis of Pregnancy: Gene Mutations in Sri Lanka

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Introduction
Dubin-Johnson Syndrome (DJS) and Intrahepatic Cholestasis of Pregnancy (ICP) are rare inherited chronic liver disorders. DJS may manifest as conjugated hyperbilirubinemia, darkly pigmented liver and presence of abnormal pigment in hepatic parenchymal cells. ICP presents as pruritus, abnormal liver biochemistry and increased bile acids.

Presenting concerns of the patient and clinical findings
A three and a half year old girl presented with recurrent episodes of jaundice. She was born to non-consanguineous parents. Her maternal grandmother has history of intermittent jaundice. On examination, child was icteric with moderate hepatomegaly. Child's mother (age 28 years) was mildly icteric without hepatosplenomegaly. There was no history of cholestasis during pregnancy.

Diagnostic Focus and Assessment
Child had conjugated hyperbilirubinaemia with mildly elevated hepatic transaminases. Urine bilirubin was positive. The serology was negative for viral hepatitis A, B and Ebstein-Barr virus. Hepatobiliary-iminodiacetic-acid cholescintigraphy (HIDA) scan did not visualise the intra or extra hepatic bile ducts. Light microscopic examination of the liver biopsy revealed diffuse, coarse brown pigments in the hepatocytes which were positive for Melanin and PAS stains. Urine coproporphyrin examination reviled abnormal distribution of the coproporphyrin isomers I and III. Genetic studies confirmed missense homozygous mutation in ABCC2/ MRP2 gene that causes DJS. Mother's total bilirubin was 37 µmol/L (3-20) and direct bilirubin was 6 µmol/L (< 3). Other liver function tests were normal. Her urine coproporphyrin isomers distribution was abnormal. Gene mutation study of mother revealed a missense heterozygous mutation in MRP2, and a missense homozygous mutation in ABCB11 / BSEP that causes ICP.

Follow-up and Outcomes
Patient remains well with intermittent jaundice precipitated by febrile illnesses.

Discussion
DJS should be considered after the common causes for conjugated hyperbilirubinaemia have been excluded. Early diagnosis prevents repeated hospital admissions and investigations.

CR5 A Rare Occurrence of Transient Hyperphosphatasaemia of Infancy and Childhood in a Child with Congenital Genu Varum

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Introduction
Transient hyperphosphatasaemia (THP) of infancy and childhood is a benign condition characterized by temporary and isolated elevation of serum alkaline phosphatase (ALP) in the absence of detectable liver or bone disease. ALP levels return to normal within weeks or months. Genu varum is a condition marked by bowing of legs.

Presenting concerns of the patient and clinical findings
A 19-month-old boy presented with bilateral genu varum. His development was normal with no other medical problems. Examination revealed no other evidence of rickets. A diagnosis of congenital genu varum was made on clinical features, biochemical parameters and on radiological evidences at the age of nine months. However, his parents were uncertain about the diagnosis and insisted on further investigations. He had markedly elevated ALP of 2410 IU/L. His renal profile, liver profile, 25-hydroxyL vitamin D level and haematological investigations were normal. ALP isoenzyme electrophoresis was performed and ALP electrophoretic pattern showed elevation of both bone and liver isoenzymes with characteristic precipitation pattern with lectin. A concluding diagnosis of THP of infancy and childhood was made.

Follow-up and outcomes
His repeat ALP became normal within two months, which is a typical of THP of infancy and childhood. His congenital genu varum was managed with braces.

Discussion
This is a very rare occurrence of THP of infancy and childhood with congenital genu varum. It is important to recognize THP of infancy and childhood to avoid unnecessary investigations and to reassure parents.

CR6

Young Girl with Unexplained Abdominal Pain, Hyponatraemia and Peripheral Demyelination

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Introduction
Porphyrias are inherited metabolic disorders resulting from partial deficiency of enzymes in heme biosynthetic pathway. We report a patient with acute intermittent porphyria (AIP) who developed progressive neurological deficit resembling Guillain-Barre syndrome.

Presenting concerns of the patient and clinical findings
A 22-year-old girl presented to the general practitioner (GP) with abdominal pain and vomiting for two days following intake of recreational drugs. GP has prescribed metronidazole and oral rehydration salt (dioralyte) and her symptoms became worse and found to have hyponatraemia. Over few days she developed symmetrical ascending weakness in all four limbs. She had noticed passing dark coloured urine intermittently. Examination revealed a conscious but disoriented patient. Abdominal examination was unremarkable. Neurological examination showed quadriparesis with no sensory loss.

Diagnostic Focus and Assessment
Laboratory investigations confirmed markedly raised urinary total porphyrins and porphobilinogen with mildly elevated faecal porphyrins. Plasma fluorescence emission spectroscopy demonstrated a porphyrin peak at 622nm. Faecal porphyrin fractionation revealed a low coproporphyrin isomer III/I ratio. Her renal profile, liver profile, vitamin B12 and folic acid levels were within the normal range. Cerebrospinal fluid was normal and no oligoclonal bands were found on CSF electrophoresis. Nerve conduction studies showed active peripheral neuronal demyelination. A final diagnosis of AIP was made. Precipitating factors that led to AIP is possibly due to recreational drugs and metronidazole.

Follow-up and outcomes
She has been referred to local rehabilitation unit for intensive rehabilitation for her neurological deficit.

Discussion
This is rare presentation of AIP with neurological manifestations and nerve conduction studies mimicking Guillain-Barre syndrome. Diagnosis of AIP demands high degree of awareness of neurological manifestations. Further, AIP should be considered in the differential diagnosis of Guillain-Barre syndrome.

RESEARCH PAPERS

RP1

A Comparison of eGFR CKD-EPI (2009) and Measured Creatinine Clearance in Determining Glomerular Filtration Rate in a Selected Population of Sri Lanka

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Introduction

Glomerular Filtration Rate (GFR) is the most widely used index of renal function. It is measured using plasma clearance of a marker molecule. Corrected creatinine clearance is often used to measure it. In routine practice GFR is estimated mathematically employing serum concentration of a marker and some demographic parameters. The guidelines recommend Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) (2009) equation to predict GFR. The aim of this study was to compare estimated GFR (eGFR) CKD-EPI (2009) with measured creatinine clearance in a group of Sri Lankans.

Materials and Methods

A descriptive cross sectional study was performed at National Hospital of Sri Lanka, in 2014, involving 75 CKD patients and 68 healthy individuals. The GFR was determined by measuring creatinine clearance. The eGFR was estimated using CKD-EPI (2009) equation. Correlation of eGFR CKD-EPI was assessed against corrected creatinine clearance.

Results

The eGFR CKD-EPI (2009) over estimated creatinine clearance with a mean bias of 8.9 mL/min. It demonstrated a good correlation when corrected creatinine clearance was less than 60 mL/min/1.73m^2. But correlation between the two was poor when corrected creatinine clearance exceeded 60 mL/min/1.73m^2.

Conclusion

The performance of eGFR CKD-EPI (2009) is sub optimal, particularly in early CKD and in healthy individuals. Therefore validation of the equation against a reference method to measure GFR is recommended in Sri Lankan population.

RP2

Audit on Serum Osmolality Testing

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Introduction

The osmolality test is performed to investigate hyponatremia, the presence of toxins, and to monitor treatment such as pituitary surgery. Serum osmolality is best performed in conjunction with urine osmolality to assess renal response. This audit assessed the clinical appropriateness of serum osmolality requesting.

Method

All the serum osmolality requests received by the laboratory, Kings College hospital NHS Foundation Trust, for two weeks in November 2013 were traced on the laboratory information system retrospectively, to find out the accompanying spot urine sample for osmolality. The clinical information was gathered from electronic patient records (EPR).

Results

Our laboratory had received 126 serum osmolality requests in the audit period. Majority (38%) were for pituitary surgery, and 34% for hyponatraemia of which 10 were for syndrome of inappropriate antidiuretic hormone secretion (SIADH). One out of 10 was unpaired and was for monitoring SIADH. Other indications included; hypernatraemia (7%), polyuria (8%), Mannitol administration (7%) and hyperglycaemia (4%). No clinical information for 2 requests (2%). Out of 126 requests, 25 (20%) were unpaired, of which 12 (50%) were appropriate; Mannitol administration (n=5), Hyperglycaemia (n=4), Renal failure (n=2) and the rest was for pituitary tumour (n=1). The other 13 (50%) was for hyponatremia thus, inappropriate. The overall clinical appropriateness was 88% (111/126).

Implementation & Re-audit

A significant number of unpaired requests were inappropriate. As the two tests are ordered as two separate requests on EPR, either can be missed easily.

Changes were implemented to EPR system by adding a 'tick box' in both serum and urine osmolality test requests. This 'alerts' the requester to consider a paired test.

A re-audit was done after 6 months to assess the impact. Out of 126 serum osmolality requests, 13 were un-paired (10%) of which 7 were appropriate, 5 were inappropriate, one did not have information.

The overall appropriateness increased to 95% compared to the previous 88%.

Conclusion

Inappropriate un-paired osmolality testing lead to repeat-testing, further sampling and delay in intervention. A simple electronic alerting system could improve test requesting, and can be adapted by most routine laboratories.

RP3

Audit on Appropriateness of Trace Element Testing in Patients on Parenteral Nutrition

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Introduction

Patients with intestinal failure/those not able to meet nutritional requirements via oral/enteral routes are on long term parenteral nutrition (PN) and prone to trace elements (TE) deficiencies. TE were added to the PN, based on recommended daily allowances but requires monitoring to optimise supplementations and we aimed to assess the clinical validity and appropriateness of TE testing in adult patients on PN.

Method

The retrospective audit reviewed all patients started on PN between March and July 2014. The audit standards were National Institute for Health and Care Excellence (NICE) nutrition guidelines on laboratory monitoring. It recommends TE testing at baseline and every 2-4 weeks. Acute phase responses can alter TE concentrations in the blood thus, confusing the interpretation of results. Therefore, it should always accompanied by C-reactive protein (CRP). Patients requiring PN >2 weeks were included but those in critical care wards were excluded. Information was obtained from our PN database, pharmacy records and electronic patient records. The data was analysed for the % of appropriate requests, % in which phlebotomy was done and % availability of results.

Results

In total 21 patients (27%) received PN >2 weeks. None of the patients had a baseline test. TE and CRP were ordered only in four patients (19%). Total number of requests for these patients was nine but phlebotomy was done only on three occasions (33%). All samples received by the lab were processed (100%).

Conclusion:

Adherence to the NICE guidelines was very poor. The phlebotomy failure was multifactorial and is under review. A routine baseline TE test adds very little to clinical management as it is difficult to foresee which patients require PN >2 weeks. Furthermore, from our previous experience TE should only be tested when CRP is <20mg/L which will exclude almost all critically ill/immediate post-op patients.

RP4

Is Non-Fasting Total Cholesterol and High Density Lipoprotein Enough to Screen in Both Diabetics and Non-Diabetics in Sri Lanka?

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Introduction
Lipid profile is a panel of blood tests that serves as an initial broad medical screening tool to identify certain genetic diseases and determine approximate risk for cardiovascular disease, certain forms of pancreatitis and other diseases. Some guidelines recommend that non-fasting total cholesterol (TC) and high density lipoprotein cholesterol (HDL-C) for screening. As non-fasting lipid profile will improve patient's compliance in routine screening and follow-up management, we evaluate the applicability of non-fasting TC, HDL-C and non-HDL-C in Sri Lankan population.

Objectives
To evaluate the differences between fasting and non- fasting TC, HDL-C and non-HDL- C in adults.

Method
This cross sectional comparative study was done in the Department of Chemical Pathology, Colombo South Teaching Hospital, Sri Lanka, including 394 patients (males; 35-65 years and female; 45 to 65 years). TC and HDL-C were measured twice in each subject within 7 days, once in non-fasting and once after a 12 hours fast.

Results
Although individual with diabetes mellitus had statistically insignificant difference between fasting and non-fasting TC, non-HDL-C and TC /HDL-C ratio, there were statistically significant differences in non-diabetics. There was no difference in HDL-C in both diabetics and non-diabetics.

Conclusion
Assessment of non-fasting TC, HDL-C, TC/HDL-C and non-HDL-C are reasonably accepted instead of fasting especially in diabetic.

RP5

Correlation of Serum Adiponectin Concentration with HbA1c, Systolic and Diastolic Blood Pressures and Anthropometric Measures in a Group of Adults

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Introduction
Adiponectin is the most abundant circulating adipokine which is recognized as a critical regulator of insulin sensitivity, tissue inflammation and lipid metabolism. There is increasing evidence suggesting that decreased serum adiponectin is associated with most of the components of metabolic syndrome.

Method
A descriptive cross–sectional study including 55 patients presented for HbA1c measurement to Medical Research Institute, Colombo during a period of one month. Apart from HbA1c, serum adiponectin, systolic and diastolic blood pressure (SBP and DBP), waist circumference (WC), height, weight (There by body mass index - BMI) were measured. The past medical history was obtained from their clinic records.

Results
Out of the studied population 65% (36) were females. Fourty two percent (23) of participants had diabetes mellitus (DM), among them majority were females (57%). Thirty eight percent (21) had hypercholesterolemia (HC) with 67% (14) of females. Hypertension (HTN) was recorded in 51% (28) of participants and in that group, 61% (17) were females.

Adiponectin had a negative linear correlation with SBP, DBP and HbA1c, both in males and females. Though adiponectin had a negative linear correlation with WC in both genders, it was significant in males (Pearson correlation value (–) 0.404). Though it is a well known fact that adiponectin has negative linear correlation with BMI, what we found was a positive linear correlation in females with a moderately strong negative correlation in males (Pearson correlation value (–) 0.505).

Conclusions
DM, HTN and HC are more common in females and adiponctin has a negative linear correlation with SBP, DBP, BMI (in males) WC and with HbA1c level.

RP6

Pattern of Thyroid Dysfunction and Its Association with Specific Paediatric Conditions in Patients Investigated at Teaching Hospital, Jaffna

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Introduction
Thyroid hormones are primarily involved in maintenance of growth, metabolism and mental development in children. The associations of thyroid dysfunction with certain common and uncommon conditions in paediatric age group were studied to enable early detection and treatment.

Objective
This study was conducted to observe the pattern of thyroid dysfunction and its association with specific conditions in paediatric age group at Teaching Hospital, Jaffna.

Method
Institution based retrospective cross sectional study was done over a period of one year (01.05.2015 to 30.04.2016) where data was extracted from the laboratory logs and analyzed using SPSS version 21. Chi-squared test was used.

Result
A total of 921 records were analyzed and 181 were excluded as we had already received samples from the same patients. Out of 840 records, 19.04 % (n=160) were hypothyroid and 45.63% were newly diagnosed. Hyperthyroid population was 1.43% (n=12) and all of them were newly diagnosed. Constipation (p=0.012), developmental delay (p=0.002), speech delay (p=0.024) and Down's syndrome (p=0) revealed a significant association with hypothyroid patients.

Conclusion
Constipation, developmental delay, speech delay and Down's syndrome were significantly associated with patients with hypothyroidism.

RP7 Prevalence of Hyperprolactinaemia and Thyroid Disorders Among Females Investigated for Subfertility

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Introduction
Subfertility affects approximately 10-15 % of couples, among these, female factors contributes for 37%. The major part of anovulatory disorders are secondary to various endocrine disorders results from dysfunction of hypothalamic-pituitary-ovarian axis and thyroid disorders.

Subfertility is a growing phenomenon in developed as well as in developing countries, and this leads to major psychological and financial burden.

Endocrine disorders are an important treatable causes in patients with subfertility.

Method
A cross sectional study was performed in a total of 100 women with primary subfertility women visiting the Endocrinology, Gynecology Clinics and Gynecology wards.

They were investigated for prolactin (PRL) and thyroid stimulating hormone (TSH) at Chemical Pathology Department, Teaching Hospital Batticaloa.

Data were analyzed using SPSS version and the values were expressed as Mean ± SE

Results
Of 100 subfertility women, 19 (19%) had mild hyperprolactinaemia (Prolactin 500-1000 mIU/L) and 8 (8%) had moderate hyperprolactinaemia (Prolactin ≥ 1000 mIU/L).

There were 8 (8%) women with elevated levels of TSH (more than 5 mIU/L). This could be primary overt hypothyroidism or subclinical hypothyroidism. As we did not measure free T4 on all the subjects, we are unable to divide these two entities.

The study population had mean prolactin level of 493 mIU/L ± 40 and mean TSH level was 2.68 mIU/L ± 0.3

Conclusion
In this study, significant number of females had biochemical evidence of hyperprolactinaemia and hypothyroidism. This could be one of the major contributory factors among females with subfertility. As we could not analyze the other factors influencing subfertility it necessitates considering a proper research on subfertility in near future.

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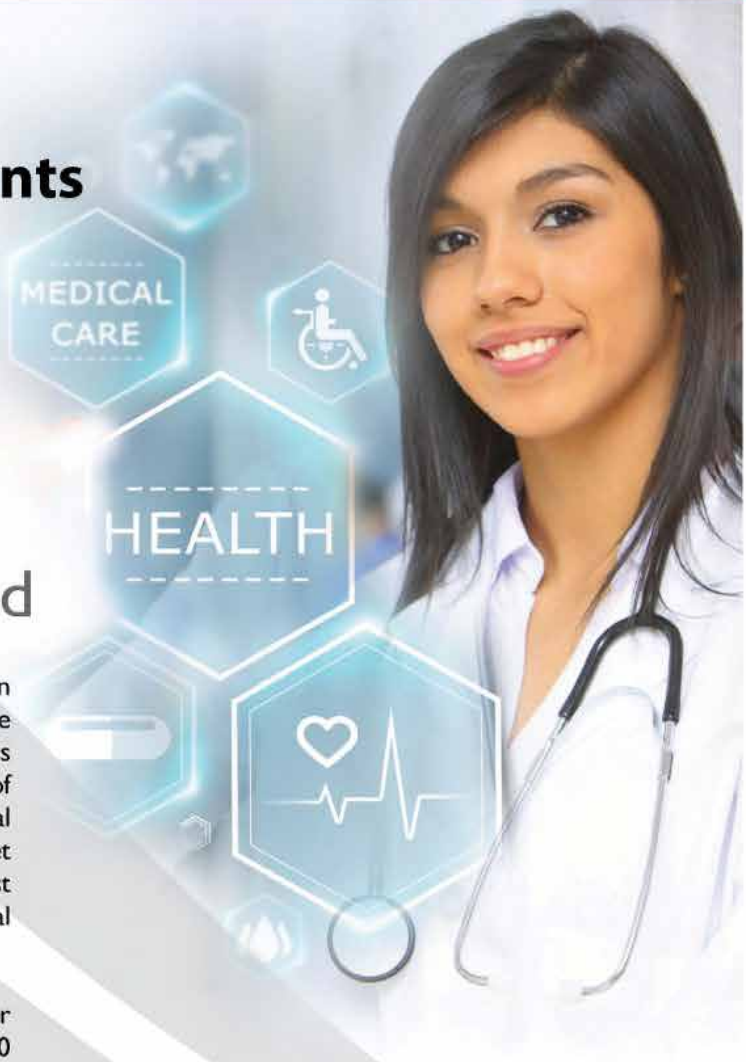

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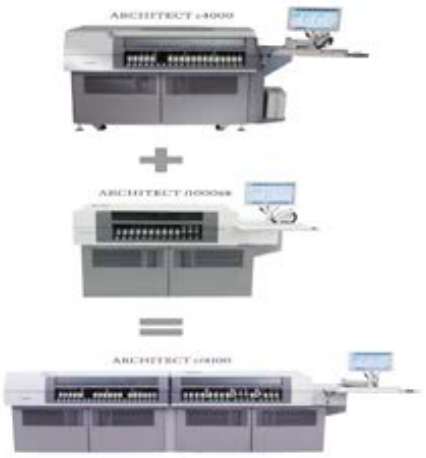

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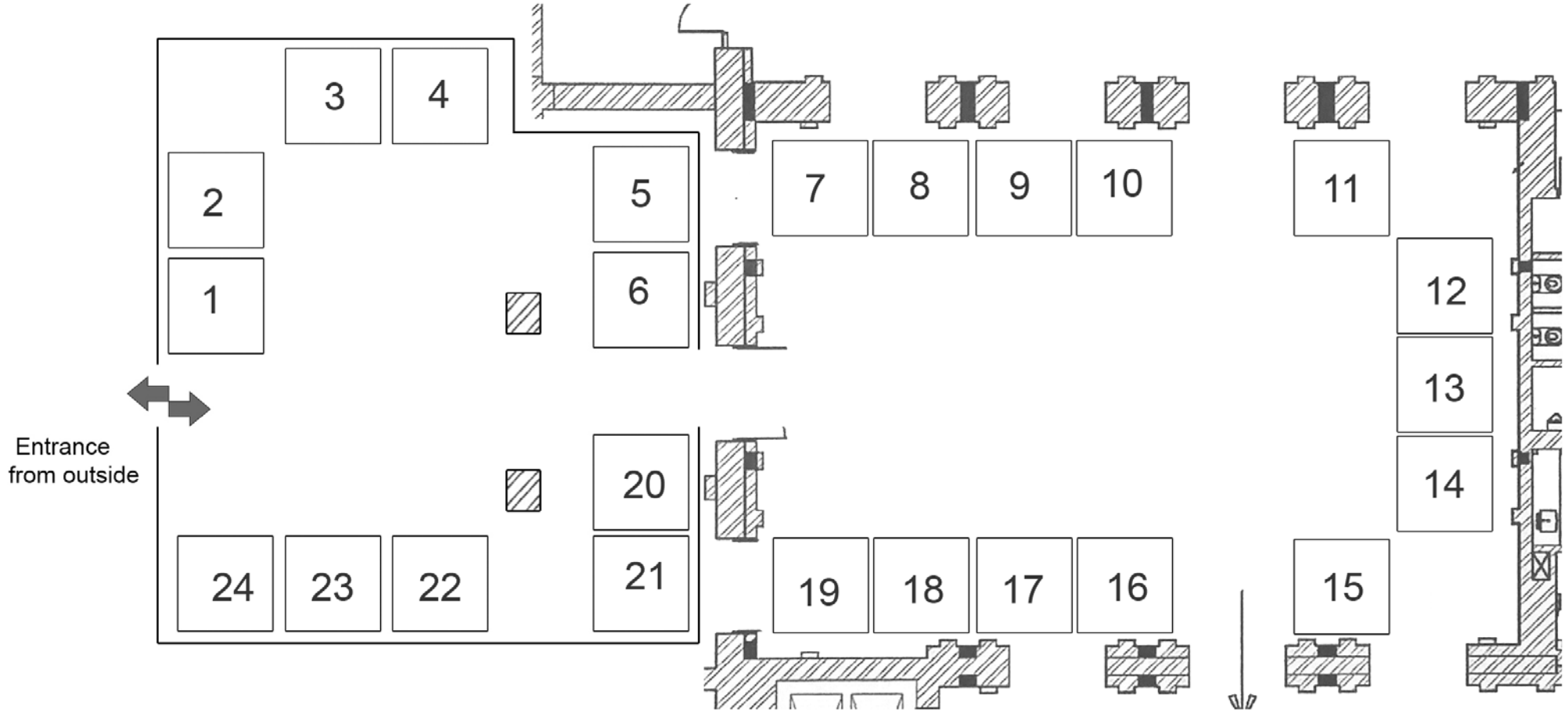

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