COLLEGE OF CHEMICAL PATHOLOGISTS OF SRI LANKA
CCPSL
Established 2015

2022
CCPSL AAS

Annual Academic Sessions

26th and 27th August
at Galadari Hotel, Colombo

"Overcoming challenges and sustaining Chemical Pathology services amidst crisis"

Annual Academic Sessions 2022
(CCPSL AAS 2022)

Contents

1.	Message from the President	5
2.	Message from the Chief Guest	6
3.	Message from the President IFCC	7
4.	Message from the President APFCB	8
5.	Message from the Deputy Director General (Laboratory Services)	9
6.	Message from the Joint Secretaries	10
7.	Photograph of the Council of CCPSL 2022	11
8.	Council of the CCPSL 2022	12
9.	Academic Programme	12-15
10.	Medical Laboratory Science Programme	16-17
11.	Inauguration Programme	18
12.	Stall Plan and Floor Plan	19
13.	Fellowship Award	20-22
14.	CCPSL Oration 2022	23-25
15.	International Guest Faculty	26-38
16.	Local Faculty	39-49
17.	Speaker Abstracts	50-73
18.	Abstracts of Oral Presentations - Research Papers	74-79
19.	Abstracts of Oral Presentations - Case Reports	80-86
20.	Abstracts of E-Posters - Research Papers	87-106
21.	Abstracts of E-Posters - Case Reports	107-154
22.	Sponsors	155-181
23.	Acknowledgements	182-183

Message from the President

Dr Kisali Hirimutugoda
MBBS, D Path, MD (Chemical Pathology)
Consultant Chemical Pathologist
District General Hospital
Negombo

It is my pleasure and honor to invite you to the 7th Annual Academic Sessions and Clinical Lab Expo of the College of Chemical Pathologists of Sri Lanka at the Galadari Hotel, Colombo on 26th and 27th August 2022 under the theme of "Overcoming Challenges and Sustaining Chemical Pathology Services Amidst Crisis."

For the 7th consecutive year, we bring current concepts in Chemical Pathology, advancements in the laboratory industry and laboratory professionals together, under the auspices of International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) and Asia Pacific Federation for Clinical Biochemistry (APFCB).

The CCPSL is a well-established organization in laboratory medicine in Sri Lanka comprising Chemical Pathologists and postgraduate trainees in Chemical Pathology to foster and lead the field of Clinical Chemistry in Sri Lanka and we are committed to improve the standards of health care and services in the country.

The 2022 AAS of CCPSL will be a unique forum for members, medical professionals, laboratory professionals and industry personal to update their knowledge on the current best practice in Chemical Pathology.

This year for the first time we have introduced the oration for the inauguration ceremony of Annual Academic Sessions and CCPSL oration 2022 "Journey of Establishing Chemical Pathology Services in Sri Lanka" will be delivered by Dr Saroja Siriwardene.

Adhering to tradition, we will conduct two parallel programmes by renowned local and seventeen foreign faculty covering a wide range of timely and important topics in Chemical Pathology. Moreover, we will bring the cutting-edge technology around the world under one roof in the Clinical Lab Expo.

To provide opportunity to more participants, the MLS programme will be a hybrid event with virtual and in-person attendees and the Clinical Lab Expo will be open to any interested non-registrant laboratory professional to obtain a unique educational tour.

I together with my Council, cordially invite you to join 2022 Annual Academic Sessions and Clinical Lab Expo in our journey towards integrating laboratory and clinical systems in Sri Lanka.

Dr Kisali Hirimutugoda
7th President
College of Chemical Pathologists of Sri Lanka

Message from the Chief Guest

Dr Asela Gunawardena
MBBS, MSc (Med Admin), MCMA, MBA (Common Wealth), Dip BS, MA
Director General of Health Services
Ministry of Health, Nutrition and Indigenous Medicine

It is with great pleasure that I send this message to convey my heartiest well wishes for the upcoming 7th Annual Academic Sessions of the College of Chemical Pathologists Sri Lanka (CCPSL) and the induction of the new President.

Chemical Pathologists play a pivotal and special role in generating quality reports that are essential in the diagnosis, screening, and management of patients.

The CCPSL has been an active organization since its establishment in 2015 and has been involved in numerous academic and administrative activities. Many academic sessions addressed by both local and international speakers were conducted this year, including a workshop for phlebotomists and medical officers in Pathology. A couple of case discussions were steered towards postgraduate trainees.

The College, in collaboration with the Ministry of Health, is involved in formulating guidelines for cost reduction this year in view of facing the current economic crisis in the country. The guidelines developed by CCPSL on handling samples eased the sufferings of many lives while assuring the safety of healthcare workers during the past two years amidst the COVID-19 pandemic.

I wish to congratulate the College on this memorable occasion. The Annual Academic Sessions will be addressed by prestigious local and foreign speakers who will aid in upgrading the knowledge of medical professionals and medical laboratory technologists. The industrial workshop will benefit entrepreneurs in the field of laboratory medicine.
I convey my best wishes for the CCPSL and the forthcoming Annual Academic Sessions.

Message from the President IFCC

It is my great pleasure to present this welcoming message to all attendees of the Annual Academic Sessions 2022, College of Chemical Pathologists of Sri Lanka. The current decade is an exciting and fast-evolving time for the field of clinical laboratory medicine, and this timely conference will be an excellent opportunity to discuss opportunities and challenges for Chemical Pathology service amidst these dynamic advancements. I strongly believe that the future holds considerable promise for the field of diagnostic medicine and laboratory professionals around the world, including the very active members of the College of Chemical Pathologists of Sri Lanka.

The IFCC organization is pleased to partner with and support this conference, enabling scientific exchange and close interactions among pathologists, laboratory scientists, and diagnostic industry colleagues. Bringing all of us together in forums like this will ensure that our organizations and the field of laboratory medicine remain at the cutting edge. It is important that we all encourage a culture of innovation, contributing to technological and process innovations across all aspects of clinical laboratory operation. We also need to strive towards a new vision for laboratory medicine, moving from a specimen-centred laboratory testing service to a partner in clinical care, supporting patient-centred clinical decision making, and being faithfully vested in patient outcomes.
I am certain that an excellent scientific and social program will be organized by the College of Chemical Pathologists of Sri Lanka. I wish you all a productive conference and an enjoyable stay in the beautiful city of Colombo.

Professor Khosrow Adeli
IFCC President

Message from the President APFCB

It is a great pleasure to learn that CCPSL is organising its Annual Academic Conference amidst this difficult time. We all are grateful that the Covid-19 pandemic has reached an endemic state, although carefulness is still very much required. However, the world, including Sri Lanka is now in deep concern about the economic and socio-political challenges faced since the Russian-Ukrainian war. We will not know when this will end and what kind of pandemic is lurking behind our doors. That is why it is a good and brave decision to go on with life and continue with the scientific developments as a better tomorrow will surely come along our path.

On behalf of APFCB President and the APFCB executive board, I would like to congratulate CCPSL for the strong leadership to organise this conference and to all who will be attending, I wish you a most successful conference.

Dr Endang Hoyarabda
APFCB Vice- President

Message from the Deputy Director General (Laboratory Services)

I am pleased to convey my best wishes to the College of Chemical Pathologists of Sri Lanka (CCPSL) on the occasion of 7th Annual Academic Sessions and the induction of the President. While extending warmest congratulations to the President and the Council in this juncture, I wish to reiterate that Chemical Pathologists play a pivotal role by providing wide range of test facilities which are crucial in diagnosis and management of patients in all levels of health care.

The College of Chemical Pathologists of Sri Lanka stands strongly and steadfastly with the Ministry of Health Sri Lanka to upgrade and improve the laboratory services in the state sector as well as in the private sector. The support and guidance provided by the CCPSL during the COVID-19 pandemic was remarkable and I highly admire the involvement of the CCPSL in the cost reduction plan for the state sector laboratories in this situation where the country is facing unprecedented challenges in managing health care services. I hope to get expert technical inputs from the CCPSL continually for upliftment of laboratory services of the country.
There is no doubt that two-day Annual Academic Sessions of CCPSL 2022 will definitely improve the knowledge and attitudes of participating health care professionals. I take this opportunity to express my sincere appreciation to the organizing committee of the academic sessions and wish every success in all upcoming endeavors of College of Chemical Pathologists of Sri Lanka.

Dr Sudath K Dharmaratne
MBBS, MSc (Admin), MD (Admin.) DIPPCA, FCMA
Deputy Director General (Laboratory Services)
Ministry of Health

Message from the Joint Secretaries

Dr Dilanthi Warawita
MBBS, Dip Chem Path, MD (Chemical Pathology)
Consultant Chemical Pathologist
Senior Lecturer
Department of Biochemistry and Molecular Biology
Faculty of Medicine
University of Colombo

Dr Thushara Hewageegana
MBBS, D Path, MD (Chemical Pathology)
Consultant Chemical Pathologist
Teaching Hospital
Anuradhapura

With our great pleasure we welcome all of you to the 7th Annual Academic Sessions, College of Chemical Pathologists of Sri Lanka, 2022 (AAS, CCPSL, 2022) to be held on 26th and 27th August, 2022 at Hotel Galadari, under the auspicious of International Federation of Clinical Chemistry (IFCC) and Asia and Pacific Federation of Clinical Biochemistry (APFCB).

Year 2022 was a demanding and a challenging year for CCPSL with a webinar series conducted by both local and international speakers, a binary trainee day session, workshops for phlebotomists and medical officers in Pathology and biweekly case discussions for postgraduate trainees in Chemical Pathology. Despite of the prevailing COVID-19 pandemic and the economic crisis of the country, the college was able to achieve all its targets and goals. The AAS is the essence of all academic activities which will be conducted this year for the 7th consecutive occasion.

The theme "Facing Challenges and Sustaining Chemical Pathology Services amidst Crisis" for this year make much sense in the middle of an economic crisis and is appropriate for the motto of the CCPSL having the key role in improvising the laboratory diagnostics.

This year the AAS covers a broad array of topics related to Chemical Pathology aiming at inspiring and improving the knowledge of the participants. The "Clinical Lab Expo, 2022" industrial exhibition will be a valuable opportunity for networking between professionals in clinical laboratories and in the industry.

We express our sincere gratitude to the President of the CCPSL for the leadership and guidance and the council for the support expressed in organizing this event. We are honored by the presence of Dr Asela Gunawardena. Director General of Health Services to join with us as the Chief Guest.

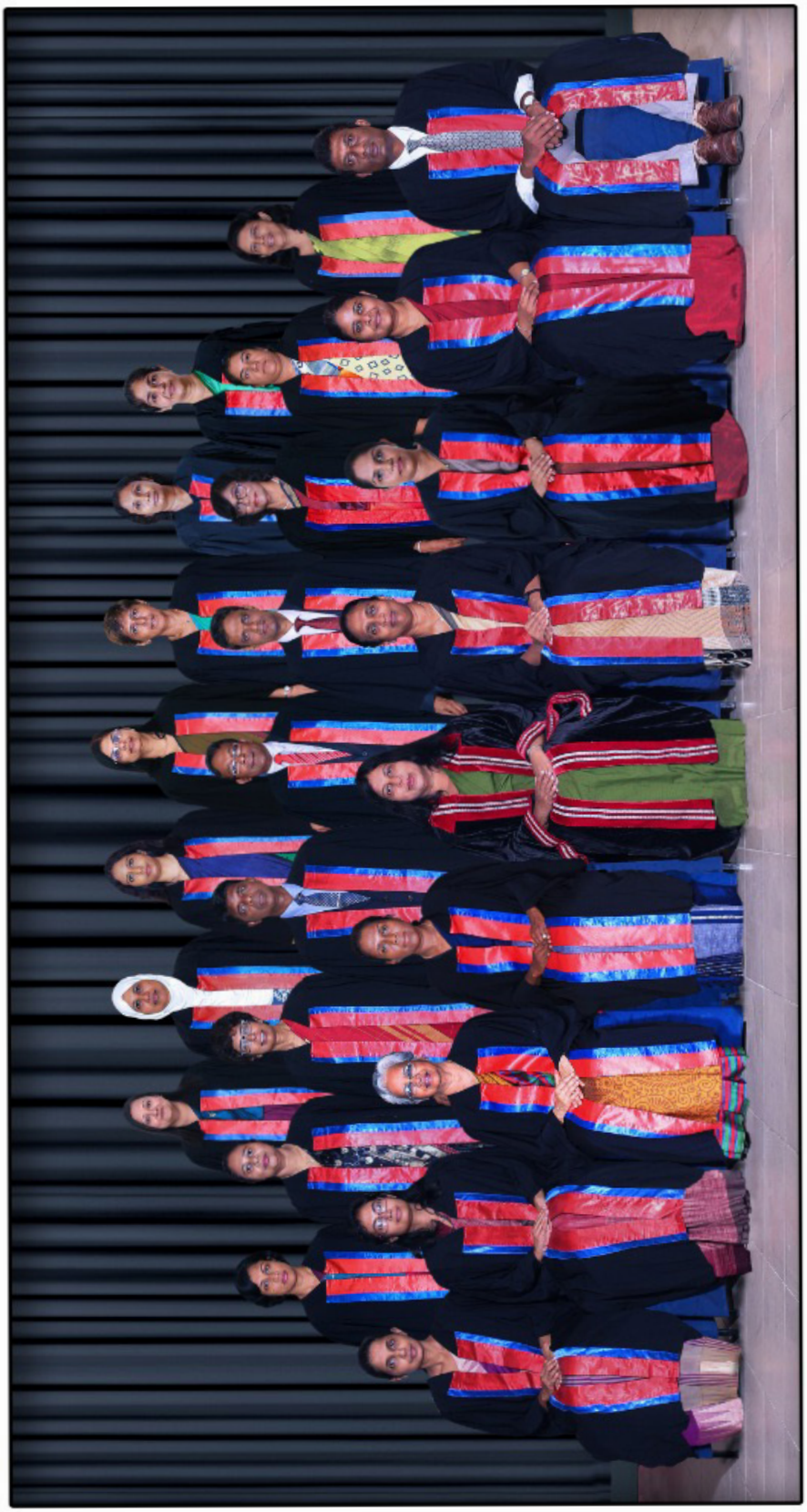
We thank all the speakers and resource persons who will share their knowledge with us.

We hope that the event will be a productive learning experience for all participants.

Dr Thushara Hewageegana
Dr Dilanthi Warawita
Joint Secretaries
CCPSL

Photograph of the Council of CCPSL

COLLEGE OF CHEMICAL PATHOLOGISTS OF SRI LANKA
THE COUNCIL 2022



Sitting (Left to right):
Dr Dilanthi Warawita, Dr Gawri Abeynayake, Dr Saroja Siriwardene, Dr Dulani Jayawardana, Dr Kisali Hirimutugoda, Dr Rajitha Samarasinghe, Dr Neranjana Vithanage, Dr Thathsarani Vithana Pathirana, Dr Thushara Hewageegana

Standing – 1st raw (Left to right):
Dr Sakunthala Jayasinghe, Dr Ganga Withana Pathirana, Dr Gaya Katulanda, Dr B.K.T.P. Dayanath, Dr Manjula Dissanayake, Dr Saman Peduru Hewa, Dr Chandrika Meegama, Dr Nangai Kularatnam, Dr Eresha Jasinge

Standing – 2nd raw (Left to right):
Dr Dilinika Perera, Dr S.I. Majitha, Dr Ushani Jayawardane, Dr Vithegi Kesavan, Dr Deepani Siriwardhana, Dr Thushari Vithanage, Dr Thamara Herath

Absent:
Dr Homathy Sivakumar, Dr Roshitha De Silva, Dr Nadeen Senanayake

College of Chemical Pathologists of Sri Lanka

President	Dr Kisali Hirimutugoda
President-Elect	Dr Dulani Jayawardana
Immediate Past President	Dr Rajitha Samarasinghe
Joint Secretaries	Dr Dilanthi Warawita Dr Thushara Hewageegana
Treasurer	Dr Neranjana Vithanage
Co-editors	Dr Gawri Abeynayake Dr Thathsarani Vithana Pathirana
Council Members	Dr Chandrika Meegama Dr Eresha Jasinge Dr Deepani Siriwardhana Dr Saman Peduru Hewa Dr Gaya Katulanda Dr B.K.T.P. Dayanath Dr Thamara Herath Dr Manjula Dissanayake Dr S.I. Majitha Dr Vithegi Kesavan Dr Homathy Sivakumar Dr Roshitha De Silva Dr Sakunthala Jayasinghe Dr Dilinika Perera Dr Ushani Jayawardane Dr Nangai Kularatnam Dr Ganga Withana Pathirana Dr Thushari Vithanage Dr Nadeen Senanayake

Academic Programme

Academic - 26th August, 2022

Time	Topic	Resource Person
11.00 am-11.30 am	Plenary 1 Understanding the relationship between cholesterol and insulin resistance	Prof Ken Sikaris 
11.30 am-01.00 pm	Symposium 1 Laboratory Management	
11.30 am-12.00 pm	Laboratory test performance specifications and relationship with method evaluation	Dr Yeo Chin Pin 
12.00 pm-12.30 pm	Which type of quality indicators to be used in clinical laboratories	Prof Mario Plebani 
12.30 pm-01.00 pm	Measurement uncertainty	Prof Tony Badrick 
01.00 pm-01.30 pm	Plenary 2 Challenge of hyponatraemia	Dr Brian Shine 
01.30 pm-02.30 pm	Lunch	
02.30 pm-03.30 pm	Symposium 2 Electrophoresis	
02.30 pm-03.00 pm	Case based discussion on diagnostic work up for monoclonal gammapathies	Dr Chandrika Meegama 
03.00 pm-03.30 pm	Well-rounded identification of paraproteins with combined protein electrophoretic approaches	Dr Ivan Lam 
03.30 pm-04.30 pm	Symposium 3 Nutrition	
03.30 pm-04.00 pm	Nutrition and biochemistry	Dr Ruvini Ranasinghe 
04.00 pm-04.30 pm	Nutritional considerations after bariatric surgery	Dr Royce Vincent 
04.30 pm-05.00 pm	Plenary 3 Familial hypocalciuric hypercalcaemia	Prof Fadil Hannan 
05.00 pm	Tea	

Academic - 27th August, 2022

Time	Topic	Resource Person
08.00 am-08.30 am	Plenary 4 CSF bilirubin xanthochromia and detection of SAH	Prof Christopher Florkowski
08.30 am-09.30 am	Symposium 4 Endocrine	
08.30 am-09.00 am	Chemical pathology in endocrine diagnosis	Dr Shivatharshia Pathmanathan
09.00 am-09.30 am	Pitfalls in thyroid test interpretation	Dr B K T P Dayanath
09.30 am-10.00 am	Plenary 5 Understanding vitamin B12 through measuring active B12	Prof Ken Sikaris
10.00 am-10.30 am	Tea	
10.30 am-11.00 am	Plenary 6 CKD screening	Dr Gaya Katulanda
11.00 am-12.00 pm	Symposium 5 Metabolic	
11.00 am-11.30 am	Urea cycle disorders-Sri Lankan experience	Dr Eresha Jasinge
11.30 am-12.00 pm	Metabolic bone diseases	Dr Mehdi Mirzazadeh
12.00 pm-12.30 pm	Plenary 7 Lipid issues in metabolic liver disease	Dr Sethsiri Wijerathna
12.30 pm-01.00 pm	Plenary 8 The use of angiogenic markers to detect preeclampsia	Prof Tim James
01.00 pm-02.00 pm	Lunch	
02.00 pm-02.30 pm	Plenary 9 Therapeutic drug monitoring	Prof Alan Wu
02.30 pm-03.30 pm	Symposium 6 Lipids	
02.30 pm-03.00 pm	Lipids disorders	Dr Gayani Weerasinghe
03.00 pm-03.30 pm	New lipid lowering medications	Dr Mayur Patel
03.30 pm-04.00 pm	Plenary 10 Analytical performance verification and quality control planning in clinical laboratory- from theory to practice	Dr Tararat Khaokhiew
04.00 pm-05.00 pm	Prize giving and closing remarks	
05.00 pm onwards	Tea	

MLS - 26th August, 2022

Time	Topic	Resource Person
10.30 am-11.00 am	Tea	
11.00 am-11.25 am	Impact of common preanalytical errors on test results	Dr Rajika Jinasena
11.25 am-11.50 am	Examples of common analytical interferences in immunoassay	Dr Nadeen Senanayake
11.50 am-12.15 pm	Common tumor markers	Dr Rajitha Samarasinghe
12.15 pm-12.40 pm	Improving performance of laboratory using lean management	Dr Thushara Hewageegana
12.40 pm-01.05 pm	HbA_{1c} - methods, analytical and clinical validation, uses	Dr Dilinika Perera
01.05 pm-02.05 pm	Lunch	
02.05 pm-02.30 pm	Verification of qualitative methods	Dr Seyed Ibrahim Majitha
02.30 pm-02.55 pm	Thyroid profile interpretation	Dr Ushani Jayawardena
02.55 pm-03.45 pm	Interactive clinical case-based discussion	Dr Thamara Herath Dr Sakunthala Jayasinghe
03.45 pm-04.10 pm	Importance of osmolality testing	Dr Dulani Jayawardena
04.10 pm-04.35 pm	Biochemical investigations in common reproductive disorders	Dr Thushari Vithanage
04.35 pm-05.00 pm	Cardiac troponin testing	Dr Gawri Abeynayake
05.00 pm	Tea	

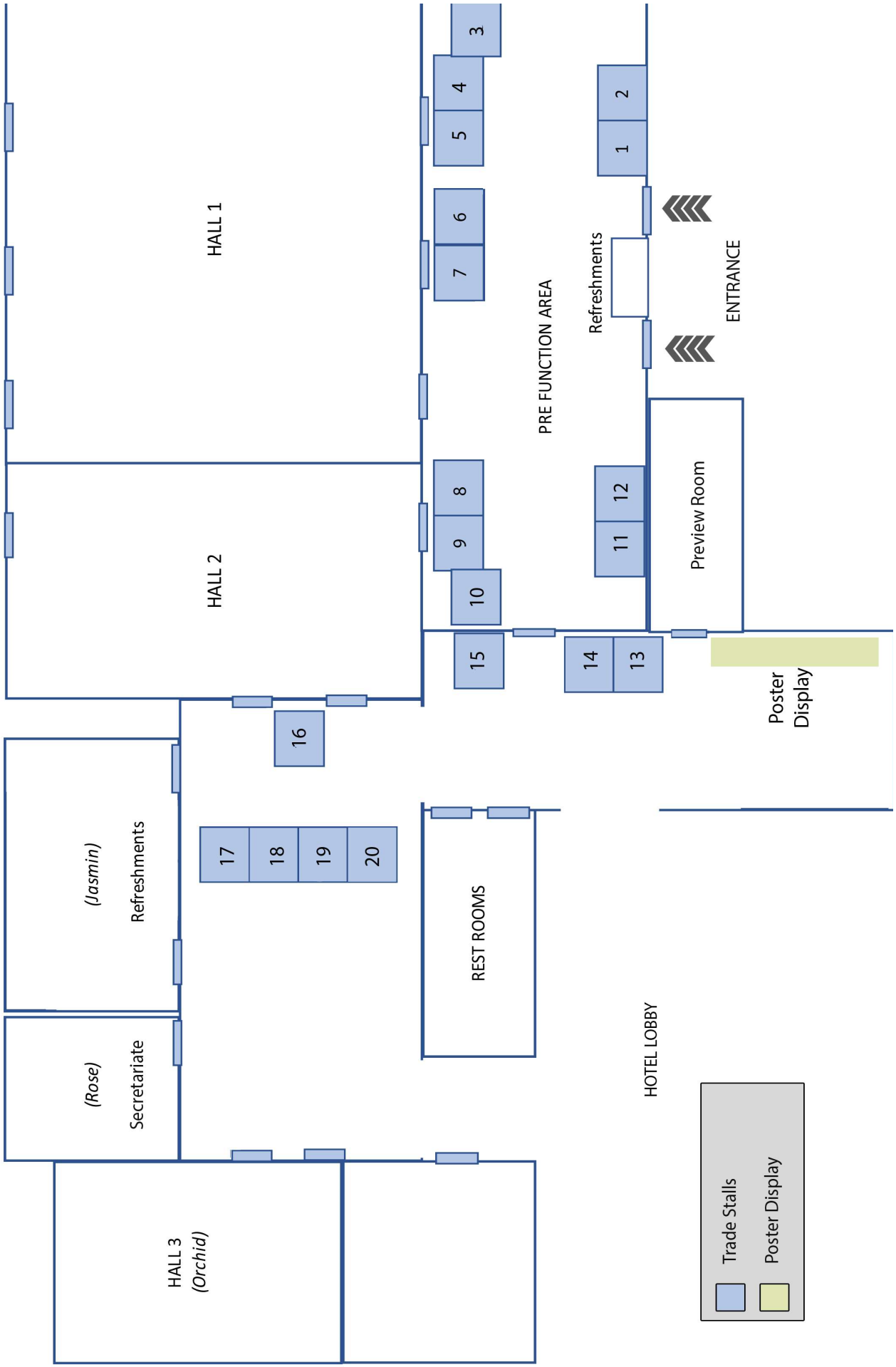
MLS - 27th August, 2022

Time	Topic	Resource Person
09.00 am-09.25 am	Calculations for reporting: getting it right	Dr Deepani Siriwardhana
09.25 am-09.50 am	Common analytical errors in spectrophotometry	Dr Neranjana Vithanage
09.50 am-10.20 am	Tea	
10.20 am-10.45 am	Importance of urine-based tests for diagnosis	Dr Manjula Dissanayake
10.45 am-11.10 am	Uncovering hidden paraproteins with high resolution capillary electrophoresis	Dr Ivan Lam
11.10 am-11.35 am	Correct practices to follow in internal quality control	Dr T Inthujah
11.35 am-12.00 pm	Common dynamic function tests	Dr Ganga Pathirana
12.00 pm-12.25 pm	Tests in lipid disorders	Dr Maduri Vidanapathirana
12.25 pm-01.25 pm	Quiz	Dr Shyamalee Gunaratne Dr Prabha Sanjeewani
01.25 pm-02.25 pm	Lunch	
02.25 pm-02.50 pm	Clinical significance of body fluids	Dr Gayani Dissanayaka
02.50 pm-03.15 pm	External quality assurance (EQA)-practical aspects for laboratorians	Dr Udara Senarathna
03.15 pm-03.40 pm	Analytical aspects with regard to diagnosis and monitoring of diabetes	Dr Rasangika Gunasekara
03.40 pm-04.05 pm	Laboratory supply chain shortage and effective test utilization during a crisis situation	Dr Shaneli Gunawardena
04.05 pm	Prize giving and closing remarks	

Inauguration Programme

07.45 am	Invitees take their seats
08.00 am	The ceremonial procession
08.05 am	National anthem
08.10 am	Lighting of the traditional oil lamp
08.15 am	Welcome address by Joint Secretary CCPSL - Dr Thushra Hewageegana
08.20 am	Induction of the new President by immediate Past President
	Dr Rajitha Samarasinghe
08.25 am	Address by the President CCPSL - Dr Kisali Hirimutugoda
08.35 am	Address by the Chief Guest - Dr Asela Gunawardana
	Director General of Health Services
08.45 am	Awards of CCPSL Felicitations and Fellowships
09.00 am	Vote of thanks by Joint Secretary CCPSL - Dr Dilanthi Warawita
09.05 am	CCPSL Oration 2022 "Journey of establishing Chemical Pathology services
	in Sri Lanka" Dr Saroja Siriwardene - Consultant Chemical Pathologist
09.35 am	Cultural show
09.55 am	Ceremonial procession leaves the hall
10.00 am	Reception

Stall Plan and Floor Plan



Fellowship Award

Fellowship Award

Professor Lal Gotabhaya Chandrasena

Professor Lal Gotabhaya Chandrasena was born in 1946 in Galle, Sri Lanka. He had his primary and secondary education in St Anthony's College, Kandy and Thurstan College, Colombo. After successful completion of advanced level examination, London and Joint Matriculation Board, Manchester, he proceeded to the United Kingdom to follow his dreams in academia and research in 1969.

He obtained B.Sc. with distinctions in Chemistry, Biology, Mathematics and Physics in 1972, B.Sc. Honors Biochemistry class 2 division 1 in 1973 and Ph.D. in Biochemistry in 1976 from the University of Liverpool, UK. Thereafter, he held posts as an Assistant Professor, Department of Biochemistry, Faculty of Veterinary Medicine, Shiraz University, Iran from 1977 to 1979, then, a Post-doctoral Fellow, Department of Physiology and Biophysics, Colorado State University, U.S.A from 1979 to 1982, a Senior Lecturer and the Head of the Department of Biochemistry, North Colombo Medical College from 1982 to 1985 and an Assistant Professor, Department of Biochemistry, Faculty of Medicine, Al-Arab Medical University, Benghazi, Libya from 1983 to1985.

Having pursued an illustrious carrier in Clinical Biochemistry worldwide he was bestowed as the founder and the Chair Professor of Biochemistry and Clinical Chemistry in the Department of Biochemistry, Faculty of Medicine, University of Kelaniya in 1991 to serve continuously for 20 years until his retirement in 2011.

He is an avid researcher. His main research interests are antioxidants, cellular metabolism, insulin resistance, metabolic markers of disease and clinical laboratory processes. He has 54 articles in peer reviewed national and international journals and 34 abstracts and presentations in conferences and professional associations both nationally and internationally to his credit. He has delivered several orations and written chapters for books. He is the recipient of four Presidential awards for scientific research published in international journals in 1999, 2000, 2002 and 2006.

He was also the recipient of several research awards conferred by Sri Lanka Medical Association which include Professor Rajasuriya Award for Tropical Medicine in 2000, E. M. Wijerama Award in 2001 and Special Price in Cardiology in 2010.
He is a member of the editorial board of the Indian Journal of Clinical Biochemistry representing Sri Lanka and was an editor for the Ceylon Journal of Medical Science, University of Colombo.

He has numerous academic affiliations. He was the President of the Association for Clinical Biochemistry, Sri Lanka. He is a Fellow of the American Association for Clinical Biochemistry, a Fellow of the National Academy of Clinical Biochemistry (USA) and a Fellow of the Royal Society of Chemistry, UK (FRCS). He is a Fellow of the National Academy of Science, Sri Lanka, a Fellow of the Institute of Chemistry Ceylon and Chartered Chemist and an Honorary Fellow of the College of Biochemists of Sri Lanka. He served as the Vice President of the National Stroke Association of Sri Lanka.

He has served as a member of the Board of Study in Medical Administration and as a member of the Board of Management of the Post Graduate Institute of Medicine, Sri Lanka.

Adding value to his academic achievements, he has served as the Laboratory Director of Nawaloka Hospitals Laboratories since 1985 and was the first academic to hold such post in the country where he nurtured quality and patient safety into a profit driven private laboratory service exhibiting his technical and managerial skills. He is an Executive Director of the Board of Directors of Nawaloka Hospitals PLC.

He has held numerous posts related to clinical laboratory services. He was the Chairman of Technical Advisory Committee on medical testing of the Sri Lanka Accreditation Board for Conformity Assessment. He is a member of the Board of Private Health Sector Regulatory Council, Ministry of Health. He served as a consultant to the Division of Environment, Ministry of Transport, Environment and Women's Affairs, Sri Lanka. He was the Chairman of the Board of Directors, State Trading Cooperation (STC) Medical Ltd., an enterprise of the Ministry of Commerce and Consumer Affairs, Sri Lanka. He also was a member of the Board of Directors of the Sri Lanka Insurance Corporation, a state-owned enterprise. He was a Council Member and a member of the Senate of the University of Kelaniya.

He was awarded the national honour of Vidyajyothy by his Excellency the President of Sri Lanka in 2017.

Apart from his academic and professional accomplishments, he is an enthusiastic social worker. He is a charter member, Rotary Club of Colombo Fort, Sri Lanka and held the post of the President of the club and organized many activities and represented Sri Lanka in international activities of the Rotary Club. He enjoys Sinhala classical music as a hobby.

He is married to Subashini, an entrepreneur in catering and an agriculturist. He is blessed with three sons all who are flourishing in their fields and achieving new heights.

CCPSL Oration 2022

Dr Saroja Siriwardene

Consultant Chemical Pathologist

Dr Saroja Chandramukee Siriwardene was born in 1953 in Colombo. She completed her primary and secondary education at Visakha Vidyalaya, Colombo, where she was adjudged the best student at O/Level and the Best Prefect of the school. She was also a member of the under-19 netball team that became all-island champions in 1972.

Dr Siriwardene entered the Faculty of Medicine, Colombo, in 1973 and graduated in 1978. Her passion for Chemistry finally paved the way for her to become the first Chemical Pathologist to graduate from the Postgraduate Institute of Medicine, Sri Lanka, in 1991. After two years as registrar in Chemical Pathology at Royal Brisbane Hospital in Australia, supervised by Dr Alan Clague, she was board certified as a Consultant. Her first appointment in 1994 was at General Hospital Badulla, and she moved on to the National Hospital of Sri Lanka in 1995 to serve for 18 years. Starting with a low-facility set-up, she was able to implement several new projects and introduce new technology to expand the services provided by the laboratory, giving high priority to cost-effectiveness. Her methods were adopted by other Pathologists and implemented in their laboratories.
Joining the board of study in Pathology at the PGIM in 1995, she became a valuable contributor as a postgraduate trainer, lecturer, and examiner for Diploma in Pathology and MD in Chemical Pathology. She always had fresh ideas for questions, be it theory or practical. When she pioneered training in Chemical Pathology, she had a vision of elevating the standard of our postgraduate trainees to that of Australia, where she trained. She gradually introduced more complicated subject matter to her students to bridge the knowledge gap, taking more than a decade to achieve her goal. Thus, she built up her own retinue of Consultant Chemical Pathologists, who started taking up posts from 1999 onwards. Numerically, she has trained 250 postgraduates for Diploma in Pathology and 40 for MD in Chemical Pathology. The Postgraduate Journal Club in Chemical Pathology, the Pathology Grand Rounds at the National Hospital, and the Annual Chemical Pathology family trip are activities which she has initiated.

As a popular lecturer, she was regularly invited to the Universities of Kelaniya, Ruhuna, Sri Jayewardenepura, and Colombo for lectures, tutorials, and examinations in the Chemical Pathology component. Her topics of interest are hormones, tumour markers, renal functions, spot urine chemistry, electrolytes, HDL cholesterol, SI units, reagent management, and accreditation, on which she has delivered many lectures at academic meetings. She has published in local journals and has won recognition and several awards both nationally and internationally for the limited researches she has done.

In 2002, she was the President of the College of Pathologists and became the Founder President of the Association for Clinical Biochemistry, Sri Lanka, in 2007. She functioned as the Treasurer of the Endocrine Society, the Treasurer of the Society of Critical Care and Emergency Medicine, and as a Council Member of the Ceylon College of Physicians for several years. She was the Founder Co-secretary of the prestigious Colombo Medical Students' Alumni Association.

She retired from the state service in 2013 and joined Lanka Hospitals Diagnostics as its full-time Chemical Pathologist the following year. She teamed up with the laboratory staff to upgrade it by expanding the test menu and acquiring accreditation status from the prestigious College of American Pathologists (CAP) in 2017.

In addition to her professional qualifications, being a "Dharmacharya", she holds a postgraduate Diploma and MA in Buddhist Studies and a postgraduate Diploma in Pali language. Dr Siriwardene is an exceptional personality having multiple interests and talents. As a consultant, she played netball for the College of Physicians at their annual encounters with Pediatricians remaining unbeaten, and was twice adjudged the best player. She is well recognized for her English rhymes and Sinhala poetry, as well as her signing prowess.

In 2020, she left the arena of Chemical Pathology, entrusting it to the 25 Chemical Pathologists, then established widely across Sri Lanka and a healthy postgraduate training programme to pursue a new goal: mind culture! However, in January 2021, during the COVID-19 crisis, she was recalled by the PGIM to serve as the special local examiner for the MD in Chemical Pathology and she coordinated all components with the external examiner in Perth, Australia.

International Guest Faculty

Professor Tony Badrick

B. App Sc, BSc, BA, M Lit St (Math), MBA, PhD(QUT), PhD(UQ), FAIMS, FAACB, FACB, FAIM, Member Aust Maths Soc, FRCPA (Hon), FFSc(RCPA), GAICD

Royal College of Pathologists of Australasia
Quality Assurance Programs

Tony Badrick was Associate Professor, Faculty of Health Sciences and Medicine at Bond University for 4 years before becoming the CEO of the RCPAQAP in 2015. He is an Adjunct Professor, School of Pharmacy and Pharmacology, Griffith University, an Honorary Associate Professor, National Centre for Epidemiology and Public Health ANU College of Health and Medicine and ANU College of Science, an Honorary Associate Professor, Faculty of Medicine, Bond University, Gold Coast, and a visiting Fellow, Australian Institute for Health Innovation, Macquarie University.

Professor Christopher Florkowski

BA, MBBS, MD (Lond), MRCP (UK), FRCPA, FRACP

Consultant Chemical Pathologist
Canterbury Health Laboratories
Christchurch, New Zealand

Originally from the UK, Chris has served in the NZ health system for over 30 years, including 23 years as a Chemical Pathologist. Chris is a former Vice President (Education and Training) of the Australasian Association for Clinical Biochemistry (AACB), an organisation where he has also served as NZ Branch Chair, as a member of the Porphyria Working Party and as an examiner (MAACB, FAACB). Chris has diverse research activities with a broad focus on how laboratory tests leverage clinically important decision making. Translating this, his journey has been all about building clinical partnerships with many disciplines.

Professor Fadil Hannon
Associate Professor & Honorary Consultant Chemical Pathologist
University of Oxford
United Kingdom

Fadil Hannan is an Associate Professor and Honorary Consultant Chemical Pathologist at the University of Oxford. Fadil investigates the endocrine mechanisms regulating mineral metabolism. His clinical academic career includes positions as an MRC Clinical Research Fellow (2004-2007), NIHR Clinical Lecturer (2007-2011), Senior Lecturer (2013-2019), and Associate Professor (2019-present). Fadil was awarded the 2013 ACB Professor's Prize for Sustained Research in Clinical Biochemistry, and in 2017 was elected to the Association of Physicians of Great Britain and Ireland. He now also runs a research group investigating the molecular endocrinology of lactation.

Professor Tim James
BSc, MSc, PhD, FIBMS
Laboratory Manager
Clinical Biochemistry
Oxford University Hospitals NHS Trust, United Kingdom

Tim James, BSc MSc, PhD, FIBMS is laboratory manager and head biomedical scientist in Clinical Biochemistry in Oxford. He has worked with many clinical teams to evaluate diagnostic tests that benefit patient care. He has published over 100 peer reviewed papers in all areas of clinical chemistry and in the last five years developed a strong collaboration with the Oxford Obstetric team which has led to a series of publications encompassing diagnosis of pre-eclampsia, developing pregnancy specific reference intervals and identifying newer markers of obstetric disease.

Dr. Tararat Khaokhiew
BSc (Medical Technology), Ph D (Medical Technology)
1. Head of Holistic Health and Medical Diagnostic
Faculty of Medical Technology
Mahidol University, Bangkok, Thailand,
2. Lecturer, Department of Clinical Chemistry
Faculty of Medical Technology
Mahidol University, Thailand

Dr Khaokhiew is a Lecturer in the Department of Clinical Chemistry, Faculty of Medical Technology, Mahidol University since 2010. She has been a member of the working group in the Conformity Assessment Bodies Panel (CAB Panel), The Medical Products Consortium of Thailand, MPCT since 2019. She was the Head of Centre of Medical Laboratory Service, Faculty of Medical Technology, Mahidol University from 2016 to 2020 before becoming the Head of Centre of Holistic Health and Medical Diagnostic, Faculty of Medical Technology, Mahidol University. There are several publications in peer reviewed local and international journal under her name. Her research interests and expertise include biotechnology, biosensor, Clinical Chemistry and Immunology, clinical laboratory, quality control & assurance in clinical laboratory, In vitro diagnostic medical devices, and relaxation and brain waves.

Dr. Chee Ren Ivan Lam
Bsc (Hons), PhD
Scientific Affairs Manager
Sebia APAC, Singapore

Dr Ivan Lam, BSc (Hons), PhD received his doctorate under a research scholarship from Nanyang Technological University (NTU) where he completed his postdoctoral fellowship and became a research group leader. His extensive cross-disciplinary research experience includes protein separation techniques, proteomics, endocrinology, dermatology, oncology, tissue engineering and had served as a peer reviewer and published in high impact journals. Dr Ivan is currently the scientific affairs manager for Sebia APAC. He passionately advocates medical education to enhance healthcare stakeholder capabilities, believing it is paramount to improving patient outcomes. He has also spoken widely to medical commu-

Dr. Mehdi Mirzazadeh
1. Consultant in Chemical Pathology and Metabolic Medicine
Epsom & St Helier University Hospitals NHS Trust
United Kingdom
2. Honarary Senior Lecturer
St Georges University of London,United Kingdom

Dr Mehdi Mirzazadeh is a consultant in Chemical Pathology and Metabolic Medicine in Epsom and St Helier University Hospitals. He has completed his training in Oxford with sub specialty training in Cambridge and UCLH in Metabolic Medicine .He is an honorary senior lecturer in St Georges University of London and clinical lead for Metabolic Bone Diseases in Epsom and St Helier University Hospitals and the Director for South West Thames Newborn screening, an assessor in the national clinical biochemistry and diagnostic medicine quality assurance services (NEQAS). He has publications in several peer-reviewed journals, especial-

Dr. Mayur Patel
BSc, MSc, PhD, MBBS, MRCP, FRCPath, PGCert
1. Consultant in Chemical Pathology and Metabolic Medicine,
Great Western Hospitals NHS Trust,
United Kingdom
2. Honorary Senior Lecturer, Medical Sciences Division
University of Oxford, United Kingdom
3. Honorary Lecturer, University of Bristol,United Kingdom

Dr. Patel is currently the Director of Clinical Practice for the Association of Clinical Biochemists and the Best Practice Editor for the Annals of Clinical Biochemistry: International Journal of Laboratory Medicine. At the Great Western Hospital, he is the Chief Clinical Information Officer and the Deputy Associate Medical Director for the Unscheduled Care division. He is also the local lead investigator for the ORION-4 study. Prior to medicine he conducted research on the novel molecular processes involved in cutaneous steroidogenesis. His specialist interests include lipid and calcium disorders and informatics.

Professor Mario Plebani
1. Full Professor of Clinical biochemistry and Clinical Molecular Biology
School of Medicine , University of Padova, Italy
2. Chairman of the IFCC Working Group on
"Laboratory errors and patient safety"

Prof. Mario Plebani is an Honorary Professor of Clinical Biochemistry and Clinical Molecular Biology at the School of Medicine, University of Padova. He was Chief of the Department of Laboratory Medicine at the University Hospital of Padova, Chief of the Center of Biomedical Research, Director of the Postgraduate School in Clinical Biochemistry at the Medical School of Padova University and President of the Course for Medical Technologists at the same Medical School of Padova. He is the Chairman of the IFCC Working group on "Laboratory errors and patient safety" (WG LEPS). Prof. Plebani is Editor-in-Chief of Clinical Chemistry and Laboratory Medicine. His main areas of research are quality in laboratory medicine, diagnostic and laboratory errors, biomarkers in cancer and cardiovascular diseases, and in vitro allergy diagnostics.

Dr. Ruvini Ranasinghe
MBBS, Dip (Chem Path), MD (Chem Path), FRCPath
King's College Hospital NHS Trust
London, United Kingdom

Dr. Ranasinghe MBBS, Dip (Chem Path), MD (Chem Path), FRCPath, is a Specialty Registrar (equivalent to ST8) in Chemical Pathology, at King's College Hospital NHS Foundation Trust, London, UK and is currently awaiting for entry to Specialty Registration in GMC. She holds a Certificate of Excellence in Lipidology offered by the European Atherosclerosis Society. Her academic interests are in nutritional biomarkers and lipidology and has carried out many audits, projects and publications on nutritional markers (plasma citrulline, prealbumin), cardiovascular disease risk assessment and lipidology, obesity and bariatric surgery, trace elements, diabetes and cardiac markers, and cytokines in COVID-19. She is also involved in undergraduate/postgraduate and laboratory staff training.

Dr. Brian Shine
MB ChB MD Birmingham, MRCPath, FRCPath, Msc Birkbeck,
Consultant Chemical Pathologist
Department of Clinical Biochemistry
John Radcliffe Hospital, Oxford, United Kingdom.

Brian 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 Birkbeck College, University of London. He has worked in Oxford since 2000 and chairs the NICE Diagnostics Advisory Committee. His interests include Endocrinology, particularly electrolytes and calcium disorders, and the use of routinely collected data in diagnosis and treatment.

Professor Ken Sikaris
MBBS , FRCPA (Chemical Pathology), FAACB (Chemical Pathology)
1. Consultant Chemical Pathologist
   Melbourne Pathology, Australia
2. Associate Professor, Department of Pathology, Melbourne University

Professor Sikaris obtained fellowships from the Royal College of Pathologists of Australasia (RCPA) and the Australasian Association of Clinical Biochemists (AACB) in 1992 and 1997 respectively. He was appointed Director of Chemical Pathology at St Vincent's Hospital in 1993 and Medical Director of Dorevitch Pathology in 1998 before starting at Melbourne Pathology in 2003. He specialises in Prostate Specific Antigen, cholesterol and quality assurance and is Chair of the RCPAQAP Key Incident Monitoring Program for Australasia. A/Prof Sikaris is a Principal Fellow of the Department of Pathology at Melbourne University and lectures to undergraduates, GPs and a variety of specialist groups across Australia and overseas. He is Director of Chemical Pathology at Melbourne Pathology.

Dr. Royce Vincent
MBBS, MSc, EuSpLM, FRCPath, MD (Res), SCOPE, FAcadTM
1. Consultant Chemical Pathologist
King's College Hospital NHS Trust
2. Honorary Senior Lecturer
King's College London, United Kingdom

Dr Royce Vincent (MBBS, MSc, EuSpLM, FRCPath, MD(Res), SCOPE, FAcadTM), is a Consultant Chemical Pathologist at King's College Hospital NHS Foundation Trust and an Honorary Senior Lecturer at King's College London, UK. He is the Clinical Lead for Parenteral Nutrition services at King's and the Strategic Clinical Lead for Chemistry & Immunology for South East London Pathology Services (King's, Guy's and St Thomas' NHS Foundation Trusts).
Dr Vincent obtained his research Doctorate at Imperial College London, UK. His academic interests are in clinical nutrition, obesity and endocrinology. He has published widely and serves as an Editor in numerous journals.

Dr. Sethsiri Wijerathna
MBBS, MD, FRCPath
1. Consultant Chemical Pathologist and Lead Clinician
Coventry and Warwickshire Pathology Services
University Hospital Coventry and Warwickshire
United Kingdom
2. Lead Pathology Advisor, Nuffield Health Care, United Kingdom

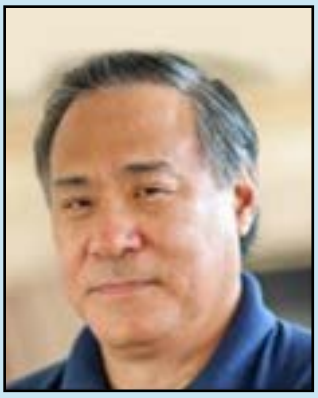
Dr Wijeratne completed his MD in Chemical Pathology from the University of Colombo, Sri Lanka in 1999 and moved to the UK for his further education and worked at St Thoma's and Guy's Hospital in London and King's College Hospital in London prior to obtaining FRCPath in 2004. He was appointed as the Consultant Chemical Pathologist at South Warwickshire NHS Hospital and later joined the University Hospital of Coventry and Warwickshire, one of the largest pathology networks in the UK. Currently, he is the Lead clinician for Biochemistry and Immunology in the network and is involved with Nuffield Health Care, UK as Lead Pathology Advisor. His current interests are provision of cost effective biochemistry, while facilitating research and innovation and providing vascular risk factor service with special interest in lipid abnormalities in liver disorders.

Dr. Gayani Weerasinghe

MBBS, Dip Chem Path, MD (Chem Path), FRCPath (UK), EuSpLM

1. Consultant Chemical Pathologist
   Co-SDU Lead/Clinical Director for Pathology.
   Buckinghamshire Healthcare NHS Trust
2. Honorary Consultant Chemical Pathologist,
   Oxford University Hospitals NHS Trust
   United Kingdom

Dr. Weerasinghe is a Consultant Chemical Pathologist at Buckinghamshire Healthcare NHS trust and works as the SDU Lead/Clinical Director for Pathology. She serves as a tutor for 4th year medical students in the University of Oxford. She is an editor of Lab Test Online UK website since 2015. She is also a member of EFLM and EFLM Academy and European Specialist in Laboratory Medicine (EuSpLM). She holds professional memberships with the RCP, the Association of Clinical Biochemistry (ACB) UK and Sri Lankan Colleges of Chemical Pathology, Pathology and Endocrinology. She has cited for total of ~ 15 publications and published abstracts in national and international meetings. She has attended Clinical Biochemistry meetings, webinars and academic sessions both nationally and internationally as an invited speaker. Her clinical interests are lipid disorders and metabolic bone disorders



Professor Alan H. B. Wu

PhD

1. Chief of Clinical Chemistry
   San Francisco General Hospital
2. Professor of Laboratory Medicine,
   University of California, San Francisco

Alan H.B. Wu, Ph.D is Chief of Clinical Chemistry at San Francisco General Hospital and Professor of Laboratory Medicine, University of California, San Francisco, and medical director for the Pharmacogenomics Laboratory. He received a Ph.D. degree in analytical chemistry at the University of Illinois, Champaign-Urbana and postdoctoral fellowship in clinical chemistry at Hartford Hospital. His research interests include pharmacogenomics, clinical toxicology, cardiac biomarkers, and point-of-care testing. Professor Wu has over 500 publications in peer-reviewed journals. He has also written eight paperback books consisting of short stories designed to promote the value of the clinical laboratory to the general public.

Dr. Chin-Pin Yeo
MBBS, FRCPA (Chemical Pathology), FAMS
Head of Department of Clinical Pathology
Singapore General Hospital

Dr Yeo 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. She was admitted as a Fellow of the Academy of Medicine of Singapore in 2003. Dr Yeo is currently the Head of the Department of Clinical Pathology in the Division of Pathology at Singapore General Hospital. The Department hosts the Clinical Biochemistry Laboratory, Satellite Laboratories and the Client and Specimen Management Units. She is also chair of the divisions of Laboratory Quality and Safety Unit and the hospital's Point-of-Care Testing Committee.

Local Faculty

Dr Gawri Abeynayake
MBBS, Dip Chem Path, MD (Chemical Pathology), Dip RCPath (UK)
Consultant Chemical Pathologist
Teaching Hospital
Kurunegala

Dr Bolonghoge Dayanath
MBBS, Dip Path, MD (Chemical Pathology), MAACB, FAACC
Consultant Chemical Pathologist
Head, Department of Pathology
Colombo North Teaching Hospital

Dr Manjula Dissanayake
MBBS, Dip Path, MD (Chemical Pathology)
Consultant Chemical Pathologist
Teaching Hospital
Karapitiya

Dr Gayani Dissanayake
MBBS, Dip Chem Path, MD (Chemical Pathology)
Acting Consultant Chemical Pathologist
District General Hospital
Gampaha

Dr Shyamalee Gunarathna
MBBS, Dip Chem Path, MD (Chemical Pathology)
Acting Consultant Chemical Pathologist
District General Hospital
Hambanthota

Dr Rasangika Gunasekara
MBBS, Dip Chem Path, MD (Chemical Pathology)
Acting Consultant Chemical Pathologist
District General Hospital
Nuwara Eliya

Dr Shaneli Gunawardena
MBBS, Dip Chem Path, MD (Chemical Pathology)
Acting Consultant Chemical Pathologist
District General Hospital
Mannar

Dr Thamara Herath
MBBS, Dip Path, MD (Chemical Pathology)
Consultant Chemical Pathologist
Medical Research Institute
Colombo

Dr Thushara Hewageegana
MBBS, Dip Path, MD (Chemical Pathology)
Consultant Chemical Pathologist
Teaching Hospital
Anuradhapura

Dr Majitha Ibrahim
MBBS, Dip Path, MD (Chemical Pathology)
Consultant Chemical Pathologist
Teaching Hospital
Batticaloa

Dr Thurairatnam Inthujah
MBBS, Dip Chem Path, MD (Chemical Pathology)
Acting Consultant Chemical Pathologist
District General Hospital
Matale

Dr Eresha Jasinge
MBBS, Dip Path, MD (Chemical Pathology)
Consultant Chemical Pathologist
Lady Ridgeway Hospital for Children
Colombo

Dr Ushani Gayathri Wijethunga Jayawardane
MBBS, Dip Path, MD (Chemical Pathology)
Consultant Chemical Pathologist
District General Hospital
Polonnaruwa

Dr Sakunthala Jayasinghe
MBBS, Dip Path, MD (Chemical Pathology) FRCPath (Associate, UK)
Consultant Chemical Pathologist
Senior Lecturer , Department of Pathology
Faculty of Medicine, University of Peradeniya

Dr Dulani Jayawardana
MBBS, Dip Path, MD (Chemical Pathology)
Consultant Chemical Pathologist
National Hospital
Kandy

Dr Rajika Jinasena
MBBS, Dip Chem Path MD (Chemical Pathology)
Acting Consultant Chemical Pathologist
District General Hospital
Kilinochchi

Dr Gaya Katulanda
MBBS, Dip Path, MD (Chemical Pathology), Dip RCPath (UK)
Consultant Chemical Pathologist
National Hospital of Sri Lanka
Colombo

Dr Chandrika Meegama
MBBS, Dip Path, MD (Chemical Pathology), FAACC (USA)
Consultant Chemical Pathologist
MCARD and Laboratory Health Care
Kalubowila

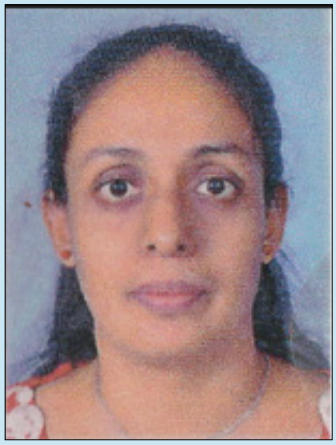
Dr Nishani Ganga Withana Pathirana
MBBS, Dip Chem Path, MD (Chemical Pathology)
Consultant Chemical Pathologist
District General Hospital
Matara

Dr Sivatharshya Pathmanathan
MBBS, MD (Medicine)
Consultant Endocrinologist
National Hospital of Sri Lanka
Colombo

Dr Dilinika Perera
MBBS, Dip Path, MD (Chemical Pathology), Associate Member RCPath (UK)
Consultant Chemical Pathologist
Sirimavo Bandaranayake Specialized Children's Hospital
Peradeniya

Dr Rajitha Samarasinghe
MBBS, Dip Path, MD (Chemical Pathology), FAACC
Consultant Chemical Pathologist
Head, Department of Pathology
National Cancer Institute
Maharagama

Dr Prabha Sanjeewani
MBBS, Dip Chem Path, MD (Chemical Pathology)
Acting Consultant Chemical Pathologist
District General Hospital
Kegalle



Dr Danika Nadeen Senanayake
MBBS, Dip Chem Path, MD (Chemical Pathology)
Consultant Chemical Pathologist
District General Hospital
Vavuniya

Dr Udara Senarathne
MBBS, Dip Chem Path, MD (Chemical Pathology)
Acting Consultant Chemical Pathologist/Lecturer
Department of Biochemistry
Faculty of Medical Sciences
University of Sri Jayawardenepura

Dr Deepani Siriwardhana
MBBS, Dip Path, MD (Chemical Pathology)
Specialist in Chemical Pathology
Senior Lecturer
Department of Biochemistry and Clinical Chemistry
Faculty of Medicine, University of Moratuwa

Dr Dinesha Maduri Vidanapathirana
MBBS, Dip Chem Path, MD (Chemical Pathology), Dip RCPath (UK)
Consultant Chemical Pathologist/Lecturer
Department of Pathology
Faculty of Medical Sciences, University of Sri Jayawardenepura

Dr Thushari Vithanage
MBBS, Dip Chem Path MD (Chemical Pathology)
Consultant Chemical Pathologist
Teaching Hospital
Ratnapura

Dr Neranjana Vithanage
MBBS, Dip Path, MD (Chemical Pathology)
Consultant Chemical Pathologist
Sri Jayewardenepura General Hospital
Thalapathpitiya
Nugegoda

Speaker Abstracts

DAY 1

Understanding the Relationship between Cholesterol and Insulin Resistance

Professor Ken Sikaris

Insulin resistance is the current terminology for what has called the Metabolic Syndrome or Syndrome X. It is a collection of clinical features that include obesity, hypertension, dysglycaemia and dyslipidaemia. All these conditions increase the clinical risk of heart disease, stroke and diabetes, which are commonly linked to cholesterol concerns. While we have progressed our understanding of cholesterol to include bad (LDL-C) and good (HDL-C) forms, however it is not commonly understood how precisely they relate to the issue of insulin resistance. Obesity represents a visceral accumulation of triglyceride in adipose tissues, the liver and the blood stream. A fatty liver correlates with insulin resistance and the resultant dysglycaemia. However, circulating triglycerides, exported from the fatty liver as VLDL both accumulate and interact with other lipoproteins causing LDL to become small (small dense LDL) as well as leading to depletion of HDL lipoproteins. Increasing insulin resistance goes hand in hand with increasing small dense LDL which is the main atherogen causing atherosclerosis.

Laboratory Test Performance Specifications and Relationship with Method Evaluation

Dr Yeo Chin Pin

Interpretation of laboratory test results can be guided by biological variation derived indices such as reference change values and index of individuality. Total allowable error limits, established from analytical imprecision and bias goals that are in turn based on biological variation, can be helpful in evaluating differences between analytical methods and developing transition strategies. This talk will share practical applications of laboratory test performance specifications and biological variation, and will seek to address two oft asked questions: Does a difference in numerical values of laboratory test results indicate a change in the patient's clinical condition? How should one compare test results from a new analytical platform against those from an old one?

DAY 1

Which Type of Quality Indicators to be Used in Clinical Laboratories

Proffesor Mario Plebani

Measurement is core to the practice of medicine and drives much of the day-to-day decision making and laboratory information plays an increasingly dominant role in modern medicine. In view of the evidence that added value underpins the ultimate quality of laboratory testing, the changing face of quality is shifting from analytical results to a global view of the TTP, including the acknowledgment and effective utilization of laboratory information. This, in turn, should require a revision of measurements in laboratory medicine. As shown in Figure 1, there are at least three categories of measures to be used in clinical laboratories. The first and traditional, is the measurement of analytical quality, the second is the use of quality indicators in the TTP, and the third is the outcomes-based approach.

Measurement of analytical quality represents a cornerstone of medical laboratory efforts to control and improve daily practices and clinical laboratories use these measures for a) internal monitoring/improvement of laboratory results, b) inter-laboratory benchmark, c) complying with regulatory requirements (regional, national or international). These measures are currently based on the hierarchy of Analytical Performance Specifications (APS), and provide information on accuracy and measurement uncertainty, thanks to the data collected in IQC and EQA programs. However, they cannot measure the quality in extra-analytical phases, and therefore many efforts have been done to develop a list of harmonized quality indicators to be used to evaluate and improve the quality of the TTP. The internal dimension of quality in laboratory medicine, therefore, is monitored using the already mentioned indicators of analytical and extra-analytical quality which assured the dramatic improvement of quality in the last decades. As previously mentioned, both IQC and EQA programs have to be improved, particularly in the metrological traceability era, but represent formidable tools for assuring accurate and reliable laboratory results.

However, the value proposition in laboratory medicine requires additional measures, related not to the quality of processes and procedures but to the outcome-based approach. Only outcome measures may provide information on the value of laboratory testing in patient management and clinical pathways, and further efforts and researches should be promoted in this field.

DAY 1

Measurement Uncertainty

Professor Tony Badrick

Measurement Uncertainty (MU) is the error associated with measuring something or a "Parameter that characterizes the dispersion of the quantity values that are being attributed to a measurand, based on the information used (official definition)" (International Vocabulary of Basic and General Terms in Metrology).

It is important because of the (incorrect) assumption that a result on a Pathology report has no error! This is even though lots of things get measured in Medicine and some error is expected.
This extends to many other aspects of quantitative reporting and interpretation of results.

Uncertainty is clinically important because;

- Any single test result has an uncertainty
- Uncertainty must be kept within useful limits
- Diagnosis is made allowing for uncertainty
- Monitoring for significance changes is made by allowing for uncertainty
- Ability to gain and maintain clinician's confidence depends on our understanding of uncertainty

I will discuss the clinically important applications of MU, namely;

- "Does This Change in Result Reflect a Pathological Process?"
- Reference Change Value
- Choice of Reporting Unit Interval
- Significant Figures
- The Problem of Using Sharply Defined Cut points
- Confidence Intervals

DAY 1

Challenge of Hyponatraemia

Dr Brian Shine

Hyponatraemia is a common clinical problem which can present acutely or chronically. I will describe the causes, including the syndrome of inappropriate ADH secretion, the main steps in diagnosing the underlying cause, including the place of newer tests such as copeptin, and an approach to managing this condition.

Case Based Discussion on Diagnostic Work Up for Monoclonal Gammapathies

Dr Chandrika Meegama

The monoclonal gammopathies are defined as heterogenous group of diseases characterized by proliferation of a single clone of plasma cells, producing immunoglobulin or light (rarely heavy) chains which can be detected in blood or urine as monoclonal (M) protein.

Among patients with multiple myeloma, approximately 73% have anemia, 79% have osteolytic bone disease, and 19% have acute kidney injury at the time of presentation. Evaluation of patients with possible multiple myeloma includes measurement of hemoglobin, serum creatinine, serum calcium, and serum free light chain levels, serum and urine protein electrophoresis with immune fixation, and full-body skeletal imaging with computed tomography, positron emission tomography, or magnetic resonance imaging.

The Revised International Staging System combines data from the serum biomarkers 2 macroglobulin, albumin, and lactate dehydrogenase in conjunction with malignant plasma cell genomic features found on fluorescence in situ hybridization-t (4; 14), del (17p), and t (14; 16)−to assess estimated progression-free survival and overall survival.

At diagnosis, 28% of patients are classified as having Revised International Staging stage I multiple myeloma and these patients have a median 5-year survival of 82%.

DAY 1

Well-Rounded Identification of Paraproteins with Combined Protein Electrophoretic Approaches

Dr Ivan Lam

Availability of novel treatments in recent years and significantly improved efficacies is increasing the consideration of the incurable multiple myeloma as a chronic disease where long term control is possible. Notable is also the rising incidence of multiple myeloma whereby patients are increasingly diagnosed with asymptomatic disease. Risk stratification models of Monoclonal Gammopathy of Undetermined Significance (MGUS) and smoldering multiple myeloma also help better identify patients with higher risk of progression. Yet myeloma remains among the hardest cancers to diagnose, experiencing higher frequency of diagnostic delays. Late diagnosis of multiple myeloma is still the cause of irreversible debilitating conditions including renal damage, bone fractures, more complications and worse disease-free survival. The Paraprotein detection and identification remains among the key approach to myeloma diagnosis and treatment response assessment.

In this talk, the principles of capillary and gel protein electrophoretic approaches for paraprotein detection will be explained. The advantages and limitations of their derived isotype testing immunotyping and immunofixation will also be discussed in detail to guide practical paraprotein identification in the clinical laboratory.

DAY 1

Nutrition and Biochemistry

Dr Ruvini Ranasinghe

Biochemical assessment of nutritional status, nutrient deficiencies and functional gut absorptive capacity is vital for the clinical management of nutrition. Use of biomarkers in evaluating nutritional status is still controversial and limited due to their non-specificity and the influence of inflammations and severe stress on blood concentrations. Yet, the markers like albumin and pre-albumin can complement the clinical history, physical examination and anthropometry in initial nutritional risk assessments. Owing to its shorter biological half-life, pre-albumin concentration is fairly sensitive to the rapid changes in nutrition, hence useful in monitoring the response for nutritional supplements.

Nutrient deficiencies, mainly micronutrients, can be evaluated using blood concentrations. However, most of them are reliable only when the concomitant C-reactive protein concentration is lower, usually less than 20 mg/L, provided that they are unaffected by acute phase reaction.

Adequate intestinal absorption is key to maintain healthy nutrition. Diverse range of gastrointestinal (GI) disorders affects the absorptive capacity of the enterocytes and this can be assessed by the biomarkers in blood, faeces and urine. Blood citrulline concentration is an evolving biomarker which directly reflects the functional capacity of enterocytes. It also plays a considerable role in determining acute and chronic intestinal failure and parenteral nutrition dependency in short bowel syndrome and GI mucositis. The diagnostic markers of GI disorders including coeliac serology and faecal calprotectin and elastin 1, indirectly serve as indicators of gut absorptive status.

In summary, currently available biomarkers are sensitive in nutritional risk assessment although they are nonspecific and affected by acute phase reactants. However, they can be used as adjuncts to conventional nutrition assessments.

DAY 1

Nutritional Considerations after Bariatric Surgery

Dr Royce Vincent

Obesity is reaching epidemic proportions, hence there is an increasing need for weight loss interventions. Bariatric (metabolic) surgery has been shown to be a clinically effective and cost-efficient intervention for those with moderate to severe obesity compared with non-surgical interventions.

In addition to providing significant and sustained weight loss, these procedures contribute towards reduction in cardiovascular disease, improvement in metabolic status, improvement in functional status and reduction in overall mortality. However, to ensure long-term postoperative success, patients must be prepared to adopt comprehensive lifestyle changes.

Many patients presenting for surgery will have pre-existing low micronutrient concentrations. All bariatric surgical procedures compromise nutrition to varying extents hence, have the potential to cause clinically significant nutrient deficiencies.

Here we will review, (i) the changes to gut anatomy following different bariatric procedures and their impact on nutritional status, (ii) the current evidence and guidelines on nutritional management in the perioperative and long-term postoperative periods.

DAY 1

Familial Hypocalciuric Hypercalcaemia

Professor Fadil Hannan

Familial hypocalciuric hypercalcaemia (FHH) is a highly penetrant autosomal dominant condition characterized by lifelong mild-to-moderate hypercalcaemia in association with normal or mildly raised serum parathyroid hormone (PTH) concentrations. FHH is considered to be benign and asymptomatic. However, patients may be misdiagnosed as having primary hyperparathyroidism (PHPT), which has a similar serum biochemical phenotype. In clinical practice, FHH is distinguished from PHPT by a 24-hour calcium to creatinine clearance ratio (CCCR) value of <0.01. However, this cut-off value has insufficient sensitivity and specificity to reliably differentiate FHH from PHPT. Additional investigations are required, and these include measurement of serum calcium concentrations in first-degree relatives and DNA sequence analysis of the FHH-causing genes. FHH comprises three genetically distinct conditions, designated as FHH types 1-3, which are due to germ line loss-of-function mutations affecting the CASR, GNA11 and AP2S1 genes, respectively. Mutations of the CASR have been reported in ~65% of FHH cases; whereas GNA11 and AP2S1 mutations account for <1% and ~10% of FHH cases, respectively. FHH types 1 and 2 are in general asymptomatic disorders; however, FHH type 3 may be associated with symptomatic hypercalcaemia, low bone mineral densities and neurodevelopmental disorders. This presentation will outline the clinical challenges in diagnosing FHH and also describe the different genetic variants of this disorder.

DAY 2

CSF Bilirubin Xanthochromia and Detection of SAH

Professor Christopher Florkowski

Subarachnoid haemorrhage (SAH) is arterial bleeding, mostly aneurysmal into the subarachnoid space which carries a mortality up to 25% and re-bleeding up to 30% within weeks if not treated. Most are detected with CT scan, although if negative, lumbar puncture is undertaken. Visual inspection of CSF for xanthochromia (yellow colour due to bilirubin) is unreliable and interpretation of red cell counts may be confounded by traumatic tap. Scanning spectrophotometry is recommended to determine the need for angiography in CT negative patients where clinical suspicion of SAH remains high and should only be performed in samples taken at least 12 hours after the onset of symptoms. Elevated bilirubin +/- oxyhaemoglobin absorbance is seen in SAH and guidance on interpretation of scans is given in the revised UK guidelines (Ann Clin Biochem 2008; 45: 238–244).

An alternative approach is direct measurement of bilirubin in CSF, although requires assay validation to measure very low concentrations. We found that at a CSF bilirubin cut-off of 359 nmol/L, based on our upper reference interval in CSF, there was 100% negative predictive value for a net bilirubin absorbance greater than 0.007, i.e. positive initial scan. In a follow-up study, the validity of this cut-off was confirmed, with no evidence from clinical records to suggest that any case of SAH had been missed (Ann Clin Biochem 2007; 44: 140–144). Whilst transferable to other analytical platforms, it is imperative that each laboratory should meticulously validate its own cut-offs and analytical performance. Otherwise, reliance should be placed on scanning spectrophotometry.

DAY 2

Chemical Pathology in Endocrine Diagnosis

Dr Sivatharshya Pathmanathan

Endocrine diseases can be challenging to diagnose, because symptoms often mimic those of other conditions. The endocrinologist establishes the diagnosis based on clinical presentation followed by confirmation through lab tests and radiological imaging. The clinical laboratory plays an essential role in both the diagnosis and therapeutic monitoring of Endocrine disorders. Successful testing relies on many factors including the ability to identify the appropriate test, the availability and reliability of the testing as well as the accuracy of the test result interpretation. A good understanding between the Chemical Pathologist and the treating Endocrinologist is necessary for the successful management of the patient.

Pitfalls in Thyroid Test Interpretation

Dr Bolonghoge Dayanath

Thyroid disorders are common in any community and thyroid function tests are the most commonly ordered hormone test in any laboratory. Most of the thyroid function tests are straightforward confirming the patient hypothyroid, hyperthyroid or thyroid. A small percentage of thyroid function tests are confusing to interpret either due to incompatibility with the clinical picture or not relating to each other of the thyroid function tests.

Most of these cases can be sorted out by digging in to detailed clinical picture including drugs, physiological status (pregnancy, age group), and intercurrent illnesses. Once these have been excluded interference in one or other laboratory assays (heterophile antibody, biotin, antistrptavidin Ab, thyroid hormone antibodies and macro TSH) needs to be excluded. Furthermore, rare thyroid disorders like absorption problems, thyroid hormone resistance needs to be considered. If a laboratory uses a systematic algorithm when such an anomalous thyroid result encountered, it will resolve the puzzle without falling in to a pit.

DAY 2

Understanding Vitamin B12 through Measuring Active B12

Professor Ken Sikaris

Vitamin B12 is a cobalt containing co-factor essential to a number of methylation pathways deficiency of which leads to haematological and neurological sequelae. Vitamin B12 is treasured by the body and it is safely chaperoned during digestion by proteins like intrinsic factor. Once absorbed, B12 is chaperoned by one of two "Transcobalamin" proteins. The most common is called haptocorrin, however haptocorrin can be seen as the storage form of vitamin B12 (similar to the role of ferritin for iron). The transport of vitamin B12 to the cells is carried out by transcobalamin (similar to the role of transferrin for iron). If this transport protein contains a load of vitamin B12 it is called holotranscobalamin, or "Active B12" because it confirms vitamin B12 is functionally available for cell uptake. Low active B12 indicates a lack of vitamin B12 available to the cell. The level of both transport proteins, haptocorrin and transcobalamin, can be altered by genetics and disease apparently leading to a discordance between the vitamin B12 levels that are stored versus what is available to cells. While active B12 is the functionally superior estimate, it is important to understand the strengths and weaknesses of this modern test.

DAY 2

CKD Screening

Dr Gaya Katulanda

Chronic kidney disease (CKD) has become a significant public health problem globally and locally. The renal replacement therapy in any form is expensive. Screening of high-risk population to identify early CKD and slowing the progression and reduction of cardiovascular risk factors will reduce the economic burden. The worldwide and prevalence of CKD is around 13%. The introduction of eGFR estimating equations, CKD classification by NKF KDOQI, and KDIGO have been able to highlight the condition and facilitate its diagnosis.

Another form of CKD, CKDu (CKD of uncertain etiology) emerged from farming communities in rural areas in Sri Lanka which has a prevalence up to 15%.

The clinical laboratory plays a major role in CKD screening in addition to its contribution in staging and monitoring of CKD. Accurate serum creatinine and urine albumin measurement, reporting of eGFR and educating clinicians on use and limitations of these tests are important. Usage of traceable creatinine assay and agreement between laboratories and clinicians are very important to standardize and optimize utilization of screening tools.

DAY 2

Urea Cycle Disorders - Sri Lankan Experience

Dr Eresha Jasinge

Urea cycle is the main pathway for converting ammonia to urea and the synthesis of arginine. It consists of six enzymes, three mitochondrial, three cytoplasmic, and two transporters. The deficiency of one of the enzymes or transporters causes urea cycle disorders. Patients often present in the neonatal period (early onset) or at any age afterwards (late onset).

A detailed analysis of urea cycle disorders in Sri Lanka is unexplored. In the absence of a newborn screening programme to detect urea cycle disorders, diagnosis is performed by quantitative analysis of plasma amino acids in patients referred upon clinical suspicion.

Out of 12 diagnosed patients, from 10 families, 8 of them had very high plasma citrulline with absent argininosuccinic acid confirming the diagnosis of argininosuccinate synthase deficiency (ASSD) (citrullinaemia type 1), three had arginase deficiency (ARD) and one with argininosuccinate lyase deficiency (ASLD). Eleven patients presented following an acute crisis with classic symptoms of poor feeding, lethargy progressing to hyperammonaemic encephalopathy. Half of the cases presented in the neonatal period, five with ASSD and one with ASLD, had a 100% mortality.

Molecular genetic analysis revealed a frequent variant, c.1168G>A (p.Gly390Arg), among ASSD patients while all three ARD patients were homozygous for the variant c.727G>A (p.Gly243Arg) in the ARG1 gene.
The presentation and high mortality among the early onset group are similar to that described in the literature. Increased awareness of the disease may facilitate maximum referrals for early diagnosis with a better outcome.

(Key Words: Urea Cycle disorders, Argininosuccinate synthase deficiency, Argininosuccinate lyase deficiency, Arginase deficiency, Sri Lanka)

DAY 2

Metabolic Bone Diseases

Dr Mehdi Mirzazadeh

In this lecture an overview of diagnosis, disease course and management of some prevalent metabolic bone diseases will be presented. Some real life examples of the role of a Chemical Pathologist in the diagnosis and management of these disorders and some recent advance in the treatment of these disorders will be explored. Osteoporosis, Paget's disease and hypophosphatasia are among some of the diseases that will be discussed.

Lipid Issues in Metabolic Liver Disease

Dr Sethsiri Wijeratne

Lipid derangements in both traditional metabolic liver diseases and modern metabolic liver diseases Eg; Metabolic associated fatty liver disease (MAFLD), will be discussed in detail.

DAY 2

The Use of Angiogenic Markers to Detect Preeclampsia

Prof Tim James

Pre-eclampsia (PE) is a complication of pregnancy, affecting 2 to 8% of pregnant women worldwide, which, if not diagnosed and treated can lead to significant maternal and fetal morbidity. The diagnosis of PE has been traditionally based on clinical assessment, new onset hypertension and proteinuria. However, more than half of the patients admitted to the hospital considered at risk of PE do not have the condition.
Historically, laboratories have undertaken a range of simple investigations when women present with suspected PE (for example creatinine, ALT, uric acid and albumin) but these have poor diagnostic accuracy. However, in the last five years there has been widespread adoption of the angiogenic markers placental growth factor (PlGF) and soluble fms-like tyrosine kinase-1 (sFlt-1).

PlGF can be used as a single test, or both markers may be measured concurrently and reported as an SfLT:PlGF ratio. The main use has been as a "Rule out" test as there is high (>99%) negative predictive value however in July 2022 revised NICE guidance in the UK has extended their use to a "Rule in" test. For the laboratory it is important to have good engagement with the obstetrics teams to ensure safe use of these tests following an agreed patient pathway. The current pathway in Oxford uses the Roche methods and the ratio results categorized as low risk (SfLT ratio <38), medium risk (ratio >38, <85) or high risk (ratio >85). With a greater number of manufacturers developing methods, which produce numerically different results, care must be taken to use appropriate method related thresholds.

The use of the markers is now becoming established in practice but a more thorough understanding of optimal use, for example, in terms of screening, confounders with respect to other complications of pregnancy, twins and serial testing require further research.

DAY 2

Therapeutic Drug Monitoring

Dr Alan Wu

Therapeutic drug monitoring (TDM) is a mainstay for clinical laboratories. In order to understand the principles of TDM, it is important to review the pharmacokinetics of drugs. Absorption of oral drugs through the gastrointestinal tract requires the drug to be in its non-ionic form. The pH of the absorbing environment and pKa of the drug dictates ionization status. Once absorbed, the drug is distributed to the various target tissues. Only free forms of the drug can cross cellular membranes. Pharmacologic agents are principally metabolized by the liver, and then excreted into the bile or urine. Only a few drugs used in clinical medicine today warrant therapeutic monitoring. The criteria for conducting testing include; verification of compliance, if there is a good relationship between drug levels and efficacy and toxicity, if the drug has a narrow therapeutic window, if there are significant drug-to-drug interactions, and if drug levels are influenced by the presence of the disease within the recipient. Drugs for which TDM is important include the anticonvulsants (phenytoin), antimicrobials (notably vancomycin), antiarrhythmic (digoxin), antidepressants (lithium), and immunosuppressants (tacrolimus).

DAY 2

Lipid Disorders

Dr Gayani Weerasinghe

Hyperlipidaemias are classified as either primary, compromising a group of genetically determined disorders, or secondary, in which the abnormalities are the results of an acquired condition.

Familial hypercholesterolaemia (FH) is the most common genetic disorder in Europe and the USA, affecting about 1 in 250-500 people in its heterozygous form. Mutations in one of the three genes are known to cause heterozygous FH are LDLR, APOB and PCSK9. FH is not the most common cause of primary hypercholesterolaemia, whereas polygenic and combined hyperlipidaemia stand as more common. There are clinical tools to identify FH cases while genetic testing helps to confirm the diagnosis.

There is strong positive relationship between cholesterol and the incidence of cardiovascular disease (CVD). CVD is the leading cause of mortality and morbidity worldwide, causing 47% of all deaths in Europe and 32% of all deaths globally each year. The identification of cases of hyperlipidaemia in the population and assessing the cardiovascular risk is important. Early treatment and management of risk factors is the cornerstone in reducing the overall mortality.

DAY 2

New Lipid Lowering Medications

Dr Mayur Patel

Statins have been the longstanding backbone of lipid lowering therapy and successfully shown to reduce cardiovascular events. In the past few years new therapeutic agents to tackle the risk posed by an elevated cholesterol have been introduced into clinical practice. These include proprotein convertase subtilisin/kexin type 9 (PCSK9) monoclonal antibodies, PCSK9 small interfering RNA (siRNA) and bempedoic acid that can individually or when combined with statin therapy improve cardiovascular outcomes. Inclisiran is a small interfering RNA that inhibits PCSK9, only needs to be injected twice year. This will improve adherence to lipid lowering therapies but also help to achieve the target LDL-cholesterol level for high-risk patients already on statin therapy. Bempedoic acid, lowers LDL-cholesterol upstream from statins by inhibiting ATP citrate lyase and provides a novel alternative for patients with statin intolerance. More outcome data is needed for the newer therapies, but they provide hope for achieving cholesterol targets and for patients intolerant to statins.

DAY 2

Analytical Performance Verification and Quality Control Planning in Clinical Laboratory - From Theory to Practice

Dr Tararat Khaokhiew

The goal of an effective laboratory is to consistently provide the appropriate examinations with quality results including accuracy, precision and reliable results. This goal includes working with practitioners to ensure the appropriate examination is ordered and the results are interpreted correctly. The vital prerequisite of analytical quality control (QC) is included in analytical performance verification and quality control planning. For analytical performance verification, the laboratory needs to verify unmodified commercial examination methods that it can perform the method and achieve results consistent with the manufacturer's stated claims of the method. Thus, analytical performance verification is an important step which is critical when manufacturer performance claims are evaluated by the end user. If the measurement procedure performance is verified and acceptable under stable operating conditions in the user's setting, this can lead to performing analytical quality control planning (QC planning). Therefore, the laboratory needs to design QC procedure to plan QC on the basis of method performance and quality required for a test via QC planning tool such as the chart of operating specification or sigma metrics QC planning tool to obtain QC specification and QC procedure to select an appropriate number of control materials, control rule and analytical run for measurement procedure as operated in individual laboratory. The efficiency of analytical performance verification and quality control planning lead to appropriate monitoring of the analytical performance of analytical procedure and alert analysts to problems that might limit the usefulness of a test result for its intended medical purpose that supports the highest level of quality and patient safety.

Abstracts of Oral Presentations - Research Papers

OP - RP 01 An Audit on the Impact of Age-Adjusted Thyroid Stimulating Hormone (TSH) Reference Interval (RI) for the Elderly, on Classifying Thyroid Status

OP - RP 04 Practical Utility of Laboratory Data including D-dimers in COVID 19: A Mul tivariate Regression Model to Predict the Disease Severity

OP - RP 05 The Association of High Sensitivity C-Reactive Protein and Albumin to Creatinine ratio with HbA_{1c} Level among Type 2 Diabetic Patients in a Tertiary Care Hospital in Sri Lanka

OP - RP 15 Evaluation of the Association between Severity of Acute SARS-CoV-2 Infection and Vaccination: A Cross-Sectional Study on a Group of Patients Admitted to a Tertiary Care Hospital in Sri Lanka

OP - RP 01

An Audit on the Impact of Age-Adjusted Thyroid Stimulating Hormone (TSH) Reference Interval (RI) for the Elderly, on Classifying Thyroid Status

Amarasekara M.H.K, Gunasekara R.A.S.R, Samarasinghe R
Department of Chemical Pathology, Apeksha Hospital, Maharagama

Introduction

TSH is the first-line thyroid function test (TFT) to assess thyroid status. Most laboratories use a uniform RI for TSH in adults. In the elderly, due to the reduced metabolic rate, minor TSH elevations may not be pathological. Therefore, common adult TSH RI can lead to over diagnosis of sub clinical hypothyroidism (SCH) in elderly people resulting in unnecessary treatment.

Methods

Data was collected from the TSH results of the biochemistry laboratory from March 2021 to May 2021, in patients aged >60 years, in whom TFTs were requested for the diagnosis/screening of thyroid disease. Patients on treatment for thyroid disease and patients with thyroid cancer were excluded. Common RI of TSH for the adults (0.4 – 4.2 mU/L) and the age-adjusted TSH RI for the elderly (60 -79 yrs: 0.4 – 5.8mIU/L, > 80 yrs: 0.4 – 6.7mIU/L: (Fontes R, Coeli CR, Aguiar F, Vaisman M. Reference interval of thyroid stimulating hormone and free thyroxine in a reference population over 60 years old and in very old subjects (over 80 years): comparison to young subjects.) Thyroid research. 2013 Dec; 6(1):1-8.) were used for the interpretation. TSH results were classified as normal, sub clinical hypo/hyperthyroidism and hypo/hyperthyroidism. Percentage of similar thyroid status by both RIs and the percentage of re-classified thyroid status by age-adjusted RR were calculated.

Results

Out of the total (111) TSH results, 17.1% indicated SCH according to common adult TSH RI, which was reduced to 9% when interpreted with age-adjusted TSH RI. Though the majority (91.9%) of TSH results showed similar thyroid status by both TSH RIs, 9% of the TSH results which indicated SCH by common adult RI were re-classified as normal with the use of age-adjusted TSH RI for the elderly.

Conclusions

Using a uniform adult RI for TSH in the elderly population (age > 60 years) can lead to over diagnosis of SCH in the elderly leading to unnecessary treatment. Age-specific TSH RIs should be used for people aged > 60 years.

Keywords

Thyroid stimulating hormone, Subclinical hypothyroidism, Age-adjusted reference interval

OP - RP 04

Practical Utility of Laboratory Data including D-dimers in COVID-19: A Multivariate Regression Model to Predict the Disease Severity

Sujeeva N[1], Balasooriya BMCM[1], Manathunga SS[2], Samarakoon SMPP[1], Gunawardena SA[1], Inthujah T[1], Wijayasuriya WAM[1], Arooran T[1], Katulanda GW[1]
[1]Department of Chemical Pathology, National Hospital of Sri Lanka
[2]National Hospital of Sri Lanka

Introduction

The chemical pathology laboratory at National Hospital of Sri Lanka performs D-dimer assay to be used as a marker of disease severity and prognosis in COVID-19.This study aimed to evaluate the correlation of D-dimer with other biochemical and haematological markers during COVID-19 and design a model comprising biochemical markers including D-dimer to predict the disease severity.

Methods

Demographic, clinical and laboratory data of 178 COVID-19 patients were evaluated retrospectively. Pearson's correlation test was performed to evaluate the correlation of biochemical markers with D-dimer. Multivariate logistic regression analysis using twelve continuous variables was conducted to design the model. A receiver operator characteristic (ROC) curve was constructed using unseen held-out data to calculate the optimum cut-off value to predict the severity.

Results

Of the 178 participants, 74 were women and 83 were diagnosed with severe COVID-19 disease. The mean age was 58.9 (SD 14.8) years. D-dimer showed a significant positive correlation with lactate dehydrogenase, aspartate transaminase and counts of total white blood cells, neutrophils and platelets ($p < 0.05$).
The multivariate logistic regression model developed including D-dimer and other markers to predict severe disease had a sensitivity of 95.83% (CI 87.5%-100%), a specificity of 71.43% (CI 53.6%-85.7%), a positive predictive value of 74.19% and a negative predictive value of 95.24% for the cut-off score of 67.5. The area under the curve of ROC curve was 0.870 (CI 77%-96%, p-value < 0.001). The AUC of ROC curve to predict the severe disease with D-dimers alone was 0.758 (CI 0.687-0.828, p-value <0.001).

Conclusions

Strong correlation of specific biochemical markers with D-dimer indicated that incorporating them in a predictive model would increase the predictive power of disease severity compared to models using D-dimer alone. Our model will aid clinicians in Sri Lanka in early prediction of clinical outcomes, better management and optimal usage of resources.

Keywords

D-dimer, Multivariate logistic regression model

OP - RP 05

The Association of High Sensitivity C-Reactive Protein and Albumin to Creatinine ratio with HbA1c Level among Type 2 Diabetic Patients in a Tertiary Care Hospital in Sri Lanka.

Warnakulasuriya BC[1], Nirmanika KKT[1], Marasinghe HMKSD[1], Vithanage AA[1], Karunarathna WAC[1], Jayasekara JKMB[1], Sumanatilleke M[2], Thilakarathna L[3], Katulanda G[3]
[1]Department of Medical Laboratory Sciences, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Sri Lanka
[2]Diabetes and Endocrinology Unit, National Hospital, Sri Lanka
[3]Department of Pathology, National Hospital, Sri Lanka

Introduction

Low-grade systemic inflammation has been observed with type 2 diabetes (T2D) as indicated by elevated high sensitivity C-reactive protein (hs-CRP) levels. This has frequently been shown to be linked with diabetic nephropathy. The aim of this study was to assess the association of hs-CRP and microalbuminuria (ACR) with HbA_{1c} levels among T2D patients and to evaluate the degree of the clinical value of hs-CRP level and ACR to evaluate the diabetic nephropathy in T2D.

Methods

A descriptive cross-sectional study was conducted on 49 T2D subjects (with a history of ≥5 years) enrolled from the diabetic clinic. Twenty-one (42.7%) male and twenty-eight (57.1%) female volunteered participants were selected based on the investigator-administered questionnaire form. HbA_{1c}, urine albumin to creatinine ratio (ACR) and hs-CRP tests were performed. Data were analysed by IBM SPSS Statistics V20 using independent sample T-test, bivariate Pearson correlation with linear regression.

Results

ACR and hs-CRP levels showed statistically significant difference among poorly and well controlled HbA1c levels ($p < 0.05$), ($P < 0.01$) while the duration of diabetes (≥10 years and <10 years) also showed a significant difference with hs-CRP levels ($p < 0.05$). However, ACR was not significantly correlated with hs-CRP level ($p = 0.088$, $r = 0.246$).

Conclusions

We have demonstrated a considerable association of low-grade systemic inflammation, as indicated by elevated hs-CRP with long-standing T2D. However, future population-based studies are required to evaluate the clinical value of hs-CRP level in predicting diabetic nephropathy in T2D.

Keywords

Diabetes Mellitus, Albumin to creatinine ratio, High-sensitivity CRP, HbA_{1c}, Diabetic nephropathy

OP - RP 15

Evaluation of the Association between Severity of Acute SARS-CoV-2 Infection and Vaccination: A Cross-Sectional Study on a Group of Patients Admitted to a Tertiary Care Hospital in Sri Lanka

Balasooriya BMCM[1], Sujeeva N[1] Manathunga SS[2], Samarakoon SMPP[1], Gunawardena SA[1], Inthujah T[1], Dissanayake DGN, Katulanda GW[1]
[1]Department of Chemical Pathology, National Hospital of Sri Lanka
[2]National Hospital of Sri Lanka

Introduction

A comprehensive understanding of the benefits of COVID-19 vaccination is critical in disease attenuation. The study aimed to compare clinical outcomes of acute SARS-CoV-2 infected patients with their vaccination status and the concentration of anti-covid IgG antibody specific to receptor-binding domain of S1 protein (RBD).

Methods

A total of 115 COVID-19 patients admitted to the National Hospital of Sri Lanka during the month of August 2021 were enrolled. History and clinical findings were obtained using an interviewer-administered questionnaire. Blood samples for anti-COVID IgG antibody from each patient were collected at the time of admission and analyzed by a two-step chemiluminescent microparticle immunoassay in ADVIA Centaur XP fully automated analyzer.

The association between vaccination status; unvaccinated (UV), partially vaccinated (PV), and fully vaccinated (FV) and disease severity; severe and non-severe was explored with logistic regression models. Correlations of anti-covid IgG antibody levels with each vaccination stage and clinical outcome were analyzed using the Kruskal-Wallis H test and the Wilcoxon rank sum test.

Results

Out of the 115 participants, 71.55% were women and mean age was 50.01 ± 18.73. The number (percentage) of UV, PV and FV were 35 (30.43%), 31(26.96%) and 49(42.6%) respectively. Severe disease was seen in 24 (20.86%). Severe disease was significantly less among FV compared to UV (OR 0.23, 95% CI: 0.05–0.78 p-value 0.01). The relative risk estimate of progression to severe disease in FV, compared with UV was 0.28 (95% CI 0.09 – 0.83, p-value 0.01). Anti-covid IgG antibodies levels were significantly increased with each vaccine dose (p-value <0.001). Association between clinical outcomes with anti-covid IgG antibody against RBD levels could not be demonstrated (Wilcoxon statistic 926, p-value = 0.586).

Conclusions

These findings are consistent with risk reduction among the fully vaccinated group compared with the unvaccinated group. The antibody level on admission among vaccinated groups didn't predict the clinical outcome.

Keywords

Anti-covid IgG antibody, COVID-19

Abstracts of Oral Presentations - Case Reports

CASE REPORTS

OP – CR 01	A Neonate with Poor Feeding and Seizures
OP - CR 02	Magnesium: Is It a Forgotten Electrolyte? Hypomagnesaemia Induced Hypokalaemia and Hypocalcaemia in Metastatic Ovarian Cancer
OP - CR 03	A Neonate with Intractable Seizures
OP - CR 04	Elevated Creatine Kinase (CK) Enzyme in an Asymptomatic Patient
OP - CR 05	Misleadingly High CA125 in a Patient with Tuberculosis

OP - CR 01

A Neonate with Poor Feeding and Seizures

Vithanage TK
Monash Pathology, Monash Medical Centre, Clayton, VIC, Australia

Introduction

Zellweger syndrome is a severe manifestation of peroxisome biogenesis disorders and characterized by dysmorphic features, seizures and severe hypotonia, present in neonatal period which is progressive and fatal.

Case presentation

One day old term baby boy of non-consanguineous parents presented with hypotonia, poor respiratory effort and seizures within 24 hours of birth. He had inability to suck, dysmorphic facial features including high forehead, widely spaced eyes and broad nasal bridge. Microcephaly and large anterior fontanelle were noted.

There was a strong family history of neurological disease and deaths at a very young age. Initial blood glucose and electrolytes were normal but hyperbilirubinaemia and elevated liver enzymes were noted. The basic urine metabolic screen, serum transferrin isoforms and plasma amino acids were normal. The MRI brain demonstrated polymicrogyria and ventriculomegaly and MRI abdomen showed bilateral cystic kidneys findings suggestive of possible Zellwegers syndrome. Plasma C24/C22 ratio and C26/C22 ratio and urinary pipecolic acid level were very high. Mutation analysis confirmed PEX6 mutation. The baby was diagnosed with Zellweger syndrome.

Discussion and conclusions

Peroxisomal biogenesis disorders are a spectrum of genetic disorders ranging from severe Zellweger syndrome to mild form of Refsum disease. It is caused by one of the mutations of PEX genes which encodes for peroxin. Peroxin is essential for proper structure and function of peroxisomes. Peroxisomes perform various functions including alpha and beta oxidation of very long chain fatty acids. Abnormal peroxisome function results in accumulation of very long chain fatty acids and abnormalities in other biomarkers of peroxisome and affects almost every organ of the body. It is diagnosed by increased very long chain fatty acid levels, other biomarkers of peroxisomal function and mutations in the PEX gene.
Although there is no definitive treatment for the disease, mutational analysis is helpful for planning future pregnancies.

Keywords

Peroxisomal biogenesis, Zellweger syndrome, Peroxin

OP – CR 02

Magnesium: Is It a Forgotten Electrolyte? Hypomagnesaemia Induced Hypokalaemia and Hypocalcaemia in Metastatic Ovarian Cancer

Hemarathne MHSL, Madurangi DWDD, De Silva DDS, Gallage BMP, Samarasinghe R
Department of Chemical Pathology, National Cancer Institute, Maharagama, Sri Lanka

Introduction

Hypomagnesaemia is a common electrolyte abnormality seen in hospitalized patients which increases the mortality and morbidity of patients with malignancies. Causes for hypomagnesaemia in malignancy are diverse. They are poor intake of magnesium, redistribution of magnesium, gastrointestinal losses, kidney losses and transdermal losses. Hypomagnesaemia is associated with several electrolyte abnormalities including hypokalaemia, hypocalcaemia and hyponatraemia.

Case presentation

A 49-year-old female with a past history of metastatic ovarian carcinoma presented with generalized body weakness, nausea, vomiting and perioral numbness. She had undergone bilateral oophorectomy and hysterectomy. She received 3 cycles of chemotherapy including Bevacizumab, Topotecan, and Doxorubicin. Physical examination findings revealed bilateral ankle swelling, perioral numbness and positive Chovstek sign. On admission to the hospital her serum total calcium was 1.78 mmol/L (2.15-2.57) and serum potassium was 2.5 mmol/L (3.5-5.3). Severe hypocalcaemia and hypokalemia were identified and treated with intravenous calcium gluconate and potassium supplements. But electrolytes abnormalities were refractory to supplements as both calcium and potassium levels did not achieve their reference range levels though there is a slight increment with supplementation. Patient was further evaluated for hypocalcaemia. She was found to have low serum magnesium levels [0.5 mmol/L (0.66-1.07)] and hypomagnesaemia was suspected as the possible cause for multiple electrolyte abnormalities. This patient was treated with intravenous magnesium sulphate for 48 hours and she maintained the stable magnesium level of 0.78 mmol/L. Then intravenous magnesium supplementation was converted to oral magnesium oxide. Her serum calcium level and potassium level returned to the normal range after the correction of serum magnesium level.

Discussion and conclusions

Hypomagnesaemia is a common medical problem in the patients with malignancies but it is an underdiagnosed condition and less attention is given as it is a commonly "Forgotten ion". Magnesium deficiency has been accompanied with several electrolyte abnormalities including hypokalaemia, hypocalcaemia. If multiple electrolyte abnormalities are refractory to repletion, magnesium deficiency should be suspected.

Keywords

Hypomagnesaemia, hypokalaemia, hypocalcaemia

OP - CR 03

A Neonate with Intractable Seizures

Vithanage TK
Monash Pathology, Monash Medical Centre, Clayton, VIC, Australia

Introduction

Molybdenum co-factor deficiency is a rare and severe metabolic disorder characterized by neurological damage including intractable seizures, feeding and respiratory difficulties and dysmorphic features. This autosomal recessive disorder is progressive and usually lethal.

Case presentation

A baby boy of consanguineous parents presented with dysmorphic features, microcephaly and intractable seizures 20 minutes after birth. CRP was normal and normal cerebral spinal fluid report excluded meningitis. MRI of the brain showed widespread cystic lesions of the brain with cerebral atrophy. His serum uric acid level was low. Urine sample was analysed for sulphite however it became negative. It was found that the urine sample was not fresh. Fresh urine sample was analysed and found high urine xanthine, sulphocysteine with low urate. Mother was not on any long term medications.

Discussion and conclusion

Three molybdenum co-factor dependent enzymes are sulphite oxidase, xanthine dehydrogenase and aldehyde oxidase). Affected patients with molybdenum co-factor deficiency (MoCD) usually present early in infancy due to neurological symptoms and signs. Sulphite oxidase causes more neurological damage due to accumulation of sulphite which is a neurotoxin. MoCD and isolated sulphite oxidase deficiency cause similar signs and symptoms. All patients who present with features suggestive of MoCD or isolated sulphite oxidase deficiency should have urine sulphite dipstick test with fresh urine sample. Differentiation of these two can be done biochemically by low serum uric acid, low urine urate, high urine xanthine and hypoxanthine in MoCD and normal serum uric acid and urine xanthine and hypoxanthine in isolated sulphite oxidase deficiency. Symptoms, signs, biochemical and MRI findings of this baby was suggestive of MoCD and confirmed by MOCS1 mutation.

Molybdenum co-factor biosynthesis dependent encoded by four genes (MOCS1, MOCS2, MOCS3 and GEPH) and any mutation can cause MoCD. Mutational analysis of genes is important for planning future pregnancies.

Keywords

Molybdenum co-factor, sulphite oxidase

OP - CR 04

Elevated Creatine Kinase (CK) Enzyme in an Asymptomatic Patient

Gunarathna KKSK, Gallage BMP, Sanjeewani JAP, Samarasinghe R
Department of Chemical Pathology, National Cancer Institute Maharagama, Sri Lanka

Introduction

Macro CK is a rare cause of raised CK that has high molecular weight and prolonged half-life found in human serum and most cases are clinically not significant. Detection of macro CK is important because it has been implicated as a source of interference in interpretation of lab reports.

Case presentation

A 58-year-old previously healthy patient who was diagnosed as dyslipidaemia on routine investigation, started atorvastatin 10 mg daily for one month duration. While on follow up, the patient was found to have elevated CK of 2778 U/L (normal value < 171 U/L). Whereas other biochemical parameters were all within reference range. 2D Echocardiogram and ECG were done to exclude cardiac causes. Atorvastatin was withholding and reanalyzing the CK level after 1-month duration. Repeated value was 3112 U/L. The patient had no symptoms of importance during this period. Endocrine causes, renal diseases and infective causes also were excluded. Macro CK was suggested after excluding other causes and laboratory examination revealed persistent elevation of CK. Sample was treated with PEG (polyethylene glycol) and pre-PEG CK and post- PEG CK values were 3112U/L and 1362U/L respectively. PEG perceptible activity (PPA%) was 56.23% (PPA% of >37 suggests macro CK). Patient was regularly followed up with lipid profile and CK levels.

Discussion and conclusions

Creatine Kinase is an enzyme found in various tissues in the human body which generates and facilitates transport of high-energy phosphates. Elevated CK is used to diagnose neuromuscular diseases, acute myocardial injury, endocrine disorders and some genetic diseases. Macro CK is a major misdiagnosis of some pathological conditions and there are several analytical methods available for Macro CK identifications.
Macro CK could be present alone or associated with other conditions, but it is important to identify as it induces false and persistent elevation of CK levels that could mislead the clinician.

Keywords

Macro CK, misdiagnosis

OP - CR 05

Misleadingly High CA125 in a Patient with Tuberculosis

Amarasekara MHK, Gunasekara RASR, Samarasinghe R
Department of Chemical Pathology, Apeksha Hospital, Maharagama

Introduction

CA125 is a glycoprotein found during the embryonic development of coelomic epithelium. It is a marker for ovarian and endometrial carcinoma.CA125 levels are elevated in > 80% of epithelial ovarian tumours. CA125 can also be elevated in other causes of mesothelial cell activation such as inflammation.

Case presentation

A 37-year-old, previously healthy lady, presented with nocturnal fever, night sweats and mild shortness of breath for 2 weeks. Her general biochemical and haematological investigations were normal except moderately elevated CRP (28 mg/L) and ESR (45 mm/1st hour). Chest x-ray (CXR) revealed a moderate right sided pleural effusion. High resolution CT scan of the chest and abdomen revealed similar changes together with mild ascites. Diagnostic thoracosentesis revealed, blood stained pleural effusion with moderately high adenosine deaminase (ADA-113 U/L) and marked mesothelial reaction. However, it was negative for acid fast bacilli (AFB) and malignant cells. Her circulating tumour markers showed markedly elevated CA 125 levels (1120 U/mL).Video assisted thoracoscopic wax biopsy was positive for AFB polymerase chain reaction (PCR) confirming the diagnosis of tuberculosis. Thereafter, she was treated with anti TB treatments for 6 months. After completion of therapy, effusion was resolved and the CA125 levels were normalized.

Discussion and conclusions

Patient's clinical history, blood stained pleural effusion and markedly elevated CA125 were highly suggestive of a malignancy. Negative pleural fluid AFB and slightly elevated ESR make TB unlikely as the other main differential diagnosis. According to literature, elevated CA125 levels are associated with tuberculosis, mainly in extra pulmonary locations with abdominal involvement. In this patient both pleural effusion and ascites may have been contributed to the CA125 elevation. CA125 levels are useful in ruling in patients suspected of having tuberculosis with negative AFB. CA125 levels can also be used to differentiate tuberculosis from other pulmonary infections. These uses of CA125 are yet to be studied in detail.

Keywords

Pleural effusion, tuberculosis, CA125

Abstracts of E-Posters - Research Papers

RP 01 An Audit on the Impact of Age-Adjusted Reference Interval (RI) for the Elderly, on Classifying Thyroid Status

RP 02 Assessing the Prevailing Safety Set-up and Practices among Staff at the Bio chemistry Department, in a Tertiary Care Hospital in Sri Lanka

RP 03 Evaluation of Accuracy of Blood Glucose Meters in all Medical Wards in a Tertiary Care Hospital in Sri Lanka

RP 04 Practical Utility of Laboratory Data including D-dimers in COVID-19: A Multivariate Regression Model to Predict the Disease Severity

RP 05 The Association of High Sensitivity C-Reactive Protein and Albumin to Creatinine ratio with HbA_{1c} Level among Type 2 Diabetic Patients in a Tertiary Care Hospital in Sri Lanka

RP 06 Thyroid Function Abnormalities in Psychiatric Patients in a Tertiary Care Hospital in Sri Lanka: Are They More Common than in Other Patients?

RP 07 An Audit to Assess the Completeness of Electrophoresis Request Form

RP 08 A Survey on Patient Satisfaction with Phlebotomy Services at a Tertiary Care Hospital in Sri Lanka

RP 09 An Audit on Requests for Thyroid Hormone Interference Studies: Do We Get Unnecessary Requests?

RP 10 An Audit to Assess the Clinical Indications and Positive Rates for which Anti Thyroid Peroxidase Antibody Level Test is Requested

RP 11 An Audit to Assess the Participation of National External Quality Assurance Sys tem (NEQUAS) within Sri Lanka Conducted by Medical Research Institute (MRI), Colombo

RP 12 An Audit to Assess the Effectiveness of Information Transfer System of Newborn Screening for Congenital Hypothyroidism by Medical Research Institute, Colom bo

RP 13 An Audit to Assess Appropriateness of Troponin Requests Received During Out-Of-Hours in a Tertiary Care Hospital in Sri Lanka

RP 14 Comparison of Internal Quality Control Methods based on Westgard Rules and Total Error in Selected Biochemical Parameters

RP 15 Evaluation of the Association between Severity of Acute SARS-CoV-2 Infection and Vaccination: A Cross-Sectional Study on a Group of Patients Admitted to a Tertiary Care Hospital in Sri Lanka

RP 16 A Descriptive Cross-Sectional Study to Evaluate the Distribution of Vitamin B12 Levels among Samples Received to Medical Research Institute, Colombo for Analysis of Vitamin B12 Levels

RP 17 Bilirubin Interference on Creatinine Assay by Jaffe and Enzymatic Methods and its Elimination by Photolysis

RP 01

An Audit on the Impact of Age-Adjusted Thyroid Stimulating Hormone (TSH) Reference Interval (RI) for the Elderly, on Classifying Thyroid Status

Amarasekara M.H.K, Gunasekara R.A.S.R, Samarasinghe R
Department of Chemical Pathology, Apeksha Hospital, Maharagama

Introduction

TSH is the first-line thyroid function test (TFT) to assess thyroid status. Most laboratories use a uniform RI for TSH in adults. In the elderly, due to the reduced metabolic rate, minor TSH elevations may not be pathological. Therefore, common adult TSH RI can lead to over diagnosis of sub clinical hypothyroidism (SCH) in elderly people resulting in unnecessary treatment.

Methods

Data was collected from the TSH results of the biochemistry laboratory from March 2021 to May 2021, in patients aged >60 years, in whom TFTs were requested for the diagnosis/screening of thyroid disease. Patients on treatment for thyroid disease and patients with thyroid cancer were excluded. Common RI of TSH for the adults (0.4 – 4.2 mU/L) and the age-adjusted TSH RI for the elderly (60 -79 yrs: 0.4 – 5.8mIU/L, > 80 yrs: 0.4 – 6.7mIU/L: (Fontes R, Coeli CR, Aguiar F, Vaisman M. Reference interval of thyroid stimulating hormone and free thyroxine in a reference population over 60 years old and in very old subjects (over 80 years): comparison to young subjects.) Thyroid research. 2013 Dec;6(1):1-8.) were used for the interpretation. TSH results were classified as normal, sub clinical hypo/hyperthyroidism and hypo/hyperthyroidism. Percentage of similar thyroid status by both RIs and the percentage of re-classified thyroid status by age-adjusted RR were calculated.

Results

Out of the total (111) TSH results, 17.1% indicated SCH according to common adult TSH RI, which was reduced to 9% when interpreted with age-adjusted TSH RI. Though the majority (91.9%) of TSH results showed similar thyroid status by both TSH RIs, 9% of the TSH results which indicated SCH by common adult RI were re-classified as normal with the use of age-adjusted TSH RI for the elderly.

Conclusions

Using a uniform adult RI for TSH in the elderly population (age > 60 years) can lead to over diagnosis of SCH in the elderly leading to unnecessary treatment. Age-specific TSH RIs should be used for people aged > 60 years.

Keywords

Thyroid stimulating hormone, Subclinical hypothyroidism, Age-adjusted reference interval

RP 02

Assessing the Prevailing Safety Setup and Practices among Staff at the Biochemistry Department, in a Tertiary Care Hospital of Sri Lanka

Inthujah T, Gunawardena SA, Dissanayake DJGGN, Samarakoon SMPP, Balasooriya BMCM, Sujeeva N, Arooran T, Thowfeek ZTM, Prashanthan S,
Katulanda GW Department of Biochemistry, National Hospital of Sri Lanka

Introduction

Laboratory biosafety is a vital area in clinical laboratories worldwide and especially in countries where laboratory accreditation is not reached consistently.
We aimed to assess the prevailing laboratory safety set-up in the biochemistry laboratory, and knowledge, attitude and practices on laboratory safety measures among laboratory staff in the biochemistry and immunoassay laboratories at the National Hospital of Sri Lanka.

Methods

We conducted a laboratory-based descriptive cross-sectional study. The laboratory safety set-up assessment was done according to WHO laboratory safety guidelines using a checklist. All staff including doctors, biochemists, medical laboratory technologists and support staff at the biochemistry and immunoassay laboratories with over 6 months of work experience were provided a self-administered questionnaire to assess the knowledge, attitude, and practices on laboratory safety measures.

Results

Working premises and facilities in the existing setup were adequate while prevailing facilities were minimal for fire hazards and waste management in the biochemistry laboratory. The 50 participants had a mean age of 43 years and 75% of them were women. Among them 75% showed satisfactory questionnaire answers on knowledge and attitude on safe laboratory working conditions. Ninety seven percent (n = 49) wore any type of mask during general procedures, but only 53% wore N95 masks during aerosol-generating procedures. Two third of staff (67%) wore gloves and only 7% used protective eyewear. Any type of hand washing was done by almost all. Managing accidents and emergencies were practiced poorly. Vaccination for hepatitis B was also poorly practiced with only 30% being fully vaccinated.

Conclusions

Trained personnel for safety is not available in the laboratory. Knowledge and attitude on safe laboratory conditions and practices need improvement. Knowledge on managing accidents, emergencies and hepatitis B vaccination need to be improved.

Keywords

Lab safety, Fire hazard, Waste management

RP 03

Evaluation of Accuracy of Blood Glucose Meters in all Medical Wards in a Tertiary Care Hospital in Sri Lanka

Gunawardena SA, Inthujah T, Dissanayake DJGGN, Samarakoon P, Katulanda GW
Department of Biochemistry, National Hospital of Sri Lanka

Introduction

Blood glucose meters are commonly used point-of-care testing devices helpful in the acute management of diabetes and other metabolic conditions to detect hyper/ hypoglycemia. Recently, we came across large discrepancies between glucose meter readings and glucose values of venous plasma obtained at the same time which invalidated the interpretation of the dynamic function tests such as insulin tolerance test and prolonged supervised fast as the decision limits are set to be interpreted at defined plasma glucose values. This study was carried out to assess the accuracy of glucose meters used during dynamic function tests.

Methods

Five glucose samples (64, 87, 100, 189, 400 mg/dL) were prepared using pooled plasma and analyzed using glucose meters in 12 medical wards. Bias was calculated at each concentration for all glucometers. Results interpreted against ISO 15197:2013 guideline (<100 mg/dL +/- 15 mg/dL & >100 mg/dL +/- 15%) for in vitro glucose monitoring systems.

Results

Out of the 12, 11 glucometers showed an accepted result at glucose concentration of 65 mg/dL with an average bias of +/- 10.1 mg/dL although 4 /12 showed a significant negative bias. Ten out of 12 glucometers (83%) were accurate at 400 mg/dL with an average bias of 3.1%. Only 3 out of 12 glucometers (25%) were accurate at all concentrations according to the guideline.

Conclusions

Negative bias in the results can lead to false diagnosis of hypoglycemia. Even though these glucometers can be used in glycaemic control of patients, it is important to use glucometers with minimal bias during dynamic function tests to reduce the wastage of reagents and minimize the cost in a clinical laboratory.

Keywords

Glucose meter, Accuracy, Dynamic function tests

RP 04

Practical Utility of Laboratory Data including D-dimers in COVID-19: A Multivariate Regression Model to Predict the Disease Severity

Sujeeva N[1], Balasooriya BMCM[1], Manathunga SS[2], Samarakoon SMPP[1], Gunawardena SA[1], Inthujah T[1] , Wijayasuriya WAM[1], Arooran T[1], Katulanda GW[1]
[1]Department of Chemical Pathology, National Hospital of Sri Lanka
[2]National Hospital of Sri Lanka

Introduction

The chemical pathology laboratory at National Hospital of Sri Lanka performs D-dimer assay to be used as a marker of disease severity and prognosis in COVID-19.This study aimed to evaluate the correlation of D-dimer with other biochemical and haematological markers during COVID-19 and design a model comprising biochemical markers including D-dimer to predict the disease severity.

Methods

Demographic, clinical and laboratory data of 178 COVID-19 patients were evaluated retrospectively. Pearson's correlation test was performed to evaluate the correlation of biochemical markers with D-dimer. Multivariate logistic regression analysis using twelve continuous variables was conducted to design the model. A receiver operator characteristic (ROC) curve was constructed using unseen held-out data to calculate the optimum cut-off value to predict the severity.

Results

Of the 178 participants, 74 were women and 83 were diagnosed with severe COVID-19 disease. The mean age was 58.9 (SD 14.8) years. D-dimer showed a significant positive correlation with lactate dehydrogenase, aspartate transaminase and counts of total white blood cells, neutrophils and platelets ($p < 0.05$).

The multivariate logistic regression model developed including D-dimer and other markers to predict severe disease had a sensitivity of 95.83% (CI 87.5%-100%), a specificity of 71.43% (CI 53.6%-85.7%), a positive predictive value of 74.19% and a negative predictive value of 95.24% for the cut-off score of 67.5. The area under the curve of ROC curve was 0.870 (CI 77%-96%, p-value < 0.001). The AUC of ROC curve to predict the severe disease with D-dimers alone was 0.758 (CI 0.687-0.828, p-value <0.001).

Conclusions

Strong correlation of specific biochemical markers with D-dimer indicated that incorporating them in a predictive model would increase the predictive power of disease severity compared to models using D-dimer alone. Our model will aid clinicians in Sri Lanka in early prediction of clinical outcomes, better management and optimal usage of resources.

Keywords

D-dimer, Multivariate logistic regression model

RP 05

The Association of High Sensitivity C-Reactive Protein and Albumin to Creatinine ratio with HbA_{1c} Level among Type 2 Diabetic Patients in a Tertiary Care Hospital in Sri Lanka.

Warnakulasuriya BC[1], Nirmanika KKT[1], Marasinghe HMKSD[1], Vithanage AA[1], Karunarathna WAC[1], Jayasekara JKMB[1], Sumanatilleke M[2], Thilakarathna L[3], Katulanda G
[1]Department of Medical Laboratory Sciences, Faculty of Allied Health Sciences,
General Sir John Kotelawala Defence University, Sri Lanka
[2]Diabetes and Endocrinology Unit, National Hospital, Sri Lanka
[3]Department of Pathology, National Hospital, Sri Lanka

Introduction

Low-grade systemic inflammation has been observed with type 2 diabetes (T2D) as indicated by elevated high sensitivity C-reactive protein (hs-CRP) levels. This has frequently been shown to be linked with diabetic nephropathy. The aim of this study was to assess the association of hs-CRP and microalbuminuria (ACR) with HbA_{1c} levels among T2D patients and to evaluate the degree of the clinical value of hs-CRP level and ACR to evaluate the diabetic nephropathy in T2D.

Methods

A descriptive cross-sectional study was conducted on 49 T2D subjects (with a history of ≥5 years) enrolled from the diabetic clinic. Twenty-one (42.7%) male and twenty-eight (57.1%) female volunteered participants were selected based on the investigator-administered questionnaire form. HbA1c, urine albumin to creatinine ratio (ACR) and hs-CRP tests were performed. Data were analysed by IBM SPSS Statistics V20 using independent sample T-test, bivariate Pearson correlation with linear regression.

Results

ACR and hs-CRP levels showed statistically significant difference among poorly and well controlled HbA1c levels ($p < 0.05$), ($P < 0.01$) while the duration of diabetes (≥10 years and <10 years) also showed a significant difference with hs-CRP levels ($p < 0.05$). However, ACR was not significantly correlated with hs-CRP level ($p = 0.088$, $r = 0.246$).

Conclusions

We have demonstrated a considerable association of low-grade systemic inflammation, as indicated by elevated hs-CRP with long-standing T2D. However, future population-based studies are required to evaluate the clinical value of hs-CRP level in predicting diabetic nephropathy in T2D.

Keywords

Diabetes Mellitus, Albumin to creatinine ratio, High-sensitivity CRP, HbA_{1c}, Diabetic nephropathy

RP 06

Thyroid Function Abnormalities in Psychiatric Patients in a Tertiary Care Hospital in Sri Lanka: Are They More Common than in Other Patients?

Jayasinghe S[1], Shamla MNF[1], Nilma L[1], Ariyarathna AGARB[2], Anfas MNA[2], Peiris DPCJ[2]
[1]Department of Pathology, Faculty of Medicine, University of Peradeniya, Sri Lanka
[2]Teaching Hospital, Peradeniya, Sri Lanka

Introduction

Patients presenting with psychiatric disorders are screened for thyroid dysfunction because they are known to cause mood disorders. This study aims to determine the prevalence of thyroid abnormalities in psychiatric patients and compare that with the prevalence of patients presenting with other features of thyroid abnormalities.

Methods

A prevalence case-control study using results of TFTs from May 2019 to December 2021 was conducted at a tertiary care hospital. 526 psychiatric patients and 9050 patients from other outpatient units (>18 years) were included. Demographic data and TFT results were evaluated and compared.

Results

The mean age of the psychiatric group was 44 years and 394 (67.9%) were females. The mean TSH was 3.1µIU/L and 449 (80.6%) had TSH within the reference interval. Forty-two (7.4%) had lower and 67(12.0%) had higher TSH than the low and upper reference limits. Of hyperthyroid patients, 28(68.3%) were females, 36(6.8%) showed subclinical hyperthyroidism and 6(1.1%) were overtly hyperthyroid. Out of 67 who had high TSH, 14(2.7%) were overtly hypothyroid. The mean age of the control group was 49.6 years and included 7728(85.4%) females. The mean TSH was 3.7µIU/L and 6189(68.4%) had TSH within the reference interval. 1447(16.05%) had TSH below the reference interval of which 3.6% were overtly hyperthyroid. 1414(15.6%) had TSH above the upper reference limit and 4.6% of them were overtly hypothyroid.

Wilcoxon rank sum test showed that the mean TSH is significantly lower in psychiatric patients than in other outpatients ($p<0.001$). There were no significant differences in the frequencies of hyper/hypothyroidism or subclinical hyper/hypothyroidism in psychiatric and control groups.

Conclusions

The prevalence of thyroid function abnormalities in the psychiatric population is similar to those previously published. This prevalence is not significantly different than in patients presenting with other symptoms of thyroid dysfunction and thus screening could be beneficial despite opposite findings in previous studies.

Keywords

Thyroid disorders, Hypothyroid, Hyperthyroid, Psychiatric patients, Thyroid function test

RP 07

An Audit to Assess the Completeness of Electrophoresis Request Form

Prashanthan S, Thowfeek ZTM, Inthujah T, Gunawardane SA, Katulanda GW
Department of Chemical Pathology, National hospital of Sri Lanka

Introduction

Request forms are considered an important communication link between the laboratory and physicians. The request form carries important information to locate and identify patient, clarify the sample collection and help in interpretation. Serum protein electrophoresis result is decisive in the diagnosis and management of multiple myeloma. Reporting of serum protein electrophoresis largely depends on demography, clinical history and past medical history of the patient. The aim of this study was to assess the level of completeness of electrophoresis requests received at the biochemistry laboratory in a tertiary care hospital.

Methods

We retrospectively reviewed all requests for serum & urine electrophoresis and immunofixation received at the biochemistry laboratory from 1st of January to 28th of February 2021 using a predefined checklist. Data were analyzed in excel.

Results

A total of 377 request forms were evaluated. (Breakdown - medical ward/OPD/medical clinics) The name, age, gender or BHT number was not mentioned in 0.3%, 9.6%, 17.5 and 4.2% of the requests respectively. Proper clinical history was documented in 61% of the requests while 27% of them had the provisional diagnosis mentioned. Twenty-nine requests were collected from diagnosed multiple myeloma patients. Among them 21(72%) of request were incomplete without previous electrophoresis results. The Majority of the requests had information about the requesting personnel according to the set standards. But 99% of requests did not have the information regarding sample collection.

Conclusions

Demographic details, clinical history and previous results are important during reporting of electrophoresis while information on sample collection is important in minimizing pre-analytical errors. Recommendations to rectify the observed shortcomings include establishing the awareness about the necessity of details, circulating protocols to be followed when filling the forms and redefining the existing request forms in view of elaboration of details.

Keywords

Request forms, Serum Protein electrophoresis

RP 08

A Survey on Patient Satisfaction with Phlebotomy Services at a Tertiary Care Hospital in Sri Lanka

Harangala PUB[1], Jayasinghe S[1], Hewageegana NSR[2]
[1]Department of Pathology, Faculty of medicine, University of Peradeniya,
[2]Former consultant Medical Administrator, Ministry of Health, Sri Lanka.

Introduction

Patient satisfaction surveys are vital for understanding of the patients' need and their opinion of the quality healthcare services. This study aims to assess the patient satisfaction with phlebotomy service received at a tertiary care hospital and the factors that affect the level of satisfaction.

Methods

We carried out a cross-sectional survey with systematic random sampling over a period of 06 weeks. An interviewer-administered questionnaire was used to collect data from 372 patients who attended the phlebotomy unit. Data were collected on demographics, facilities at the phlebotomy service, information given to patients, and communication and technical skills of the phlebotomists on a scale from dissatisfied to very satisfied. Interviews were carried out in all three languages as necessary.

Results

The study included 273 (73.4%) females, the majority (70.1%) were >45 years and 71.5% were educated up to GCE O/L. Nearly half (48.4%) have visited this phlebotomy >6 times. The satisfied and very satisfied fraction was higher for the facilities given, professionalism and skills of the staff. Out of the total, 70.4% of patients were satisfied with the sample reception hours. Among the participants, 51.3 and 44.4% were dissatisfied with the information provided before specimen collection and information given regarding report collection respectively. About one forth (23.9%) were dissatisfied with the information received about post phlebotomy complications and how to overcome them. While 49.5% were dissatisfied with patient identification methods used by the staff, around two third (58.9%) of the participants admitted that they were satisfied with the overall service offered including cleanliness, waiting time and professionalism of the staff.

Conclusions

The information given to the patient about sample collection was an important determinant of patient satisfaction. We suggest that regular training of phlebotomists and other staff, on effective communication as well as technical skills is important to meet the high expectations of patients.

Keywords

Phlebotomy, Patient satisfaction, Blood drawing, Patient experience

RP 09

An Audit on Requests for Thyroid Hormone Interference Studies: Do We Get Unnecessary Requests?

Sujeeva N, Thowfeek ZTM, Balasooriya BMCM, Prashanthan T, Samarakoon SMPP, Gunawardena SA, Inthujah T , Dissanayake G,Wijayasuriya WAM, Katulanda GW
Department of Chemical Pathology, National Hospital of Sri Lanka

Introduction

At present thyroid function tests are measured using fully automated immunoassay platforms with high accuracy and precision. However, the possibility of assay interferences is not eliminated completely in immunoassay. As thyroid functions are commonly requested, and clinically incompatible results are common the RIA laboratory performs interference studies on request. The interference study consists of replication in different platforms, sample dilutions, and polyethylene glycol (PEG) precipitation. However, it was noticed that the majority of the results did not reveal interference.
This study aims to find out the extent of rational use of thyroid interference studies in a tertiary care hospital in Sri Lanka.

Methods

We retrospectively reviewed the requests received at the laboratory from January 2020 to March 2022 and results for possible clinical outcome and analyzed the data in Excel.

Results

Of 32 requests, 22(69.80%) were from women; age ranged from 18 to 88. Twenty were from endocrine clinics while the rest was from medical clinics. All requests were based on clinically incompatible results. The commonest pattern was low TSH with normal fT4 (11) and the second commonest was high TSH with normal fT4 while on acceptable doses of therapy (6). There were 4 requests which had normal thyroid profile with clinical symptoms suggestive of hypothyroidism (2) and hyperthyroidism (2). Of 32 requests, 5 (15.6%) gave evidence of interference in TSH or fT4 assays. Poor compliance was the commonest reason found in negative requests.

Conclusions

Thorough history taking will help more rational use of thyroid interference studies and reduce the unnecessary burden in Chemical Pathology department.

Keywords

Interference studies, Rational use

RP 10

An Audit to Assess the Clinical Indications and Positive Rates for which Anti Thyroid Peroxidase Antibody Level Test is Requested

Panapitiya NP, Aththanayake AMIS, Nayani MMD, Herath TPK
Medical Research Institute, Colombo

Introduction

Thyroid peroxidase antibody (TPOAb) testing is a special biochemical test mainly used to identify the autoimmune etiology of thyroid diseases. Autoimmune thyroiditis is the commonest cause of hypothyroidism in Sri Lanka and around 75% of patients with chronic autoimmune thyroiditis are known to have positive TPOAb titres.

However, TPOAb testing is only useful in the management of patients with subclinical hypothyroidism, nodular thyroid goitre and in evaluating patients with recurrent miscarriages with or without sub-fertility according to the ATA/AACE guidelines for management of hypothyroidism in adults.
We conducted an audit to assess the indications for which TPOAb levels were requested from Medical Research institute-Colombo and to evaluate the positivity rate.

Methods

We assessed all the requisitions of patients aged 18 years and above, received from 01.01.2022 to 31.03.2022 for analysis of TPOAb. We obtained the documented indications from the request forms and the test results from laboratory information system. Test results were compared with the documented indications using SPSS.

Results

Out of all samples received during the study period (n=239) 58.6% had positive results. Only 13.4% of the requests were for recommended indications namely, subclinical hypothyroidism (9.2%), nodular goitre (2.9%) and recurrent miscarriages (1.3%). The majority of subclinical hypothyroidism (63.6%) and recurrent miscarriages (66.7%) gave positive results while the positive rate of nodular goitre was 28.6%.

The commonest indication was hypothyroidism (28.9%) of which 76.8% had positive results. Next frequent indications were autoimmune thyroiditis (13.8%), hyperthyroidism (11.3%), hashimoto encephalopathy (4.6%) and other autoimmune diseases (4.2%) which had 72.7%, 59.3%, 27.3% and 20% positive rates respectively. Thirteen percent had no documented indication out of which 41.3% gave positive results.

Conclusions

Only a minority requested for recommended indications. Limiting TPO antibody testing to occasions where it provides additional useful information to decide on the patient management plan can reduce healthcare cost of the country.

Keywords

Thyroid peroxidase antibody test, Clinical indications

RP 11

An Audit to Assess the Participation of National External Quality Assurance System (NEQAS) within Sri Lanka Conducted by Medical Research Institute (MRI), Colombo.

Sandaruwani WADS, Pathirana RPMMR, Herath T
Department of Chemical Pathology, Medical Research Institute, Sri Lanka

Introduction

The purpose of implementing external quality assurance (EQA) programme in the clinical bio-chemistry laboratory is evaluation of intra and inter-laboratory performance of specific tests. MRI conducts NEQAS with the participation of 130 laboratories. It helps the laboratories that have not enrolled in international EQA program due to lack of funds. Participating laboratories collect the EQA samples every six months from MRI. They are required to return the results each month prior to assigned date. Results are analyzed and reports are issued to the participating laboratories.
We noted that participation in the programme was inadequate though the MRI spends huge amount of the budget per cycle. Aim of the study is to assess the participation and causes for lack of participation for NEQAS programme.

Methods

A retrospective study was conducted. Details of EQA result from June 2021 to December 2021 were obtained by the EQA result sheets. We contacted each laboratory and got the explanation for their fail.

Results

The number of laboratories who collected the EQA samples was 114 (87.6%) and 16 (12.3%) were failed due to unavailability of transportation.

Out of 114, 36 (31.6%) laboratories had sent results while 27 (23.7%) had not for all 6 months. The majority of laboratories, 73 (64%) failed to submit results in July and this was 60, 50 , 50, 52 and 47 in August, September, October, November and December respectively.
Lack of transportation 16(12.3%), instrument failures 16(14%), shortage of reagents 20(17.5%), Late results 7(6.1%) and lack of laboratory technicians 3(2.6%) are the reasons identified for the failure.

Conclusions

Upon further inquiry we identified that the issues in transportation had been there in previous cycles too.
Establishment of a transport system to dispatch the EQA samples at the beginning of each cycle and extensive awareness campaign about the procedure would improve the participation.

Keywords

External quality assurance programme, Inadequate participation

RP 12

An Audit to Assess the Effectiveness of Information Transfer System of Newborn Screening for Congenital Hypothyroidism, by Medical Research Institute, Colombo

Mohideen SB, Panapitiya NP, Aththanayake AMIS, Jayasinghe AU, Herath TPK
Medical Research Institute, Colombo, Sri Lanka

Introduction

Newborn screening for congenital hypothyroidism is an important aspect of preventive medicine, as early detection and treatment will prevent severe outcomes such as mental retardation. Heel prick samples collected in all newborns within 5 days are analyzed at Medical Research Institute, Colombo and Nuclear Medicine Unit, Galle. Dried Blood Spot (DBS) TSH values of more than 20IU/ml are considered critical and informed the medical officer of health of the relevant area by telephone and an email will be sent without a delay. Positive babies in the newborn screening will undergo a confirmation test by analyzing venous TSH to initiate treatment. The aim of this audit is to assess the effectiveness of the information transfer system of newborn screening for congenital hypothyroidism conducted by Medical Research Institute, Colombo during the period of 1st of January, 2022 to 31st of March 2022.

Methods

Details of all newborn Dried Blood Spot (DBS) TSH tests performed from 1st of January to 31st of March, 2022 were obtained from the request forms and the critical levels were selected. Parents were contacted retrospectively and questioned about, whether they received the information and confirmatory venous TSH was carried out or not.

Results

The total number of positive results was 111 during the study period and 65.8% had a level of DBS TSH in between 20IU/ml to 30IU/ml, and only 15.8% had more than 100IU/ml. From those positives, 57.4% of parents received the information from the information transfer system, 21.8% of parents didn't receive and 20.8% of parents were unable to be contacted. From those who received the information, 69.2% had normal serum TSH and 30.8% had been confirmed with congenital hypothyroidism.

Conclusions

Timely informing critical values is crucial for patient safety as treatment can be started on time and irreversible mental retardation can be prevented. So, the information transfer system of newborn screening program of congenital hypothyroidism should be revised to identify the gaps to ensure the quality of the service.

Keywords

Newborn screening, Congenital hypothyroidism, TSH

RP 13

An Audit to Assess Appropriateness of Troponin Requests Received During Out-Of-Hours in a Tertiary Care Hospital in Sri Lanka

Jayaweera WJATA, Abeyrathna MHNSM, Abeywickrama PDM, Nugawela LRCS, Ansaf MAM, Abeynayake GPN

Department of Chemical Pathology, Teaching Hospital Kurunegala

Introduction

The guidelines recommend the use of high-sensitivity cardiac troponin (hs-cTn) either T or I in the diagnostic workup of acute coronary syndrome (ACS) without ST elevation. However, inappropriate troponin requesting in the absence of true clinical context can lead to increased health care cost. We found that the number of requests were much higher during the out-of-hours. Our aim was to analyse hs-cTn requests for indications, and define an appropriate request, diagnostic yield and potential cost of inappropriate requests.

Methods

We conducted a retrospective audit looking at hs-cTn requests received for patients above 18 years during out-of-hours to the Biochemistry Department over a random one-week period in March 2022 and patient records analysing the reason for the request, their outcome and diagnostic yield. Prior audits utilising appropriateness criteria (Heart 2021; 107(Suppl 2):A1-A59, Abusalma et al, 2014) were used to determine an appropriate request. Sex-specific cut-offs were used to categorise requests as positive and negative.

Results

A total of 171 patient records were analysed and the majority were (63.2% /108) females. The mean age was 60.05 ± 17(SD) years. Out of the total, 57.9% (99) were deemed appropriate while 42.1% (72) were deemed inappropriate. Among the positives 30.5% (52), 20 were consistent with ACS giving a diagnostic yield of 11.7%. Other causes for positive troponin included heart failure (8), stable coronary artery disease (7), sepsis (1), CKD (5), arrhythmia (2), myocarditis (1), CVA (2) and pneumonia (2).

Each troponin request costs approximately 1000 Sri Lankan rupees and estimated yearly expenditure due to inappropriate requests would be nearly 3.5 million rupees during out of hrs.

Conclusions

There is a trend of requesting troponin as a routine test among junior doctors without awareness of when a troponin test is appropriate. Therefore, a local guideline for troponin requesting and awareness posters and staff information sessions are required.

Keywords

Appropriateness of Troponin Requests, Acute Coronary Syndrome, Diagnostic yield

RP 14

Comparison of Internal Quality Control Methods based on Westgard Rules and Total Error in Selected Biochemical Parameters

Hewa SP, Athapaththu AMTU, Samarasinghe NMMK, Thusyanthy P, Liyanagunawardana JE, Jinasena TMRR
Department of Chemical Pathology, Colombo South Teaching Hospital,
Kalubowila, Sri Lanka

Introduction

Monitoring and ensuring the analytical performance in real time during analytical runs is one of an IQC's primary goals. Any IQC programme should, therefore, be able to spot analytical issues before they become serious. This study's objective was to assess the suitability of the two IQC methods for error detection by comparing Westgard multi rules (WMR) against total Error and sigma matrices (TE%&S).

Methods

Two Beckman Coulter AU 480 biochemistry analysers with closely similar performances were selected for the study. Daily IQC data of six analytes were collected for a period of three months. While one analyser was controlled with WMR, the other one was controlled with TE%+S. Prospective descriptive analysis was done on number of aspects including the capability of methods on error detection in relation to sensitivity and specificity.

Results

Both approaches clearly demonstrate the ability to recognize trends but WMR detects them earlier. The rate of error alarms requiring action was higher with WMS than with the other. However, the rate of false alarms with respect to allowable CV%, allowable bias% and EQA results are higher with the WMR and thus, the cost for correction, compared to the other. Since all calculations of TE%&S were derived from running mean and CV% in a block of results, the time taken for an alarm to occur was longer than WMR, particularly when the systematic error was moderate. Therefore, some systematic errors which required action were ignored with TE%&S. Nevertheless, this problem was less when sigma matrices were considered using a daily assessed bias.

Conclusions

The IQC programmes based on TE%&S and WMR rules are complementary to each other in making decisions for an appropriate action and therefore, can be used together to uphold the required quality and reduce the unnecessary expenditure.

Keywords

Sensitivity, Specificity, Error detection, Analytical error

RP 15

Evaluation of the Association between Severity of Acute SARS-CoV-2 Infection and Vaccination: A Cross-Sectional Study on a Group of Patients Admitted to a Tertiary Care Hospital in Sri Lanka

Balasooriya BMCM[1], Sujeeva N[1] Manathunga SS[2], Samarakoon SMPP[1], Gunawardena SA[1], Inthujah T[1], Dissanayake DGN , Katulanda GW[1]
[1]Department of Chemical Pathology, National Hospital of Sri Lanka
[2]National Hospital of Sri Lanka

Introduction

A comprehensive understanding of the benefits of COVID-19 vaccination is critical in disease attenuation. The study aimed to compare clinical outcomes of acute SARS-CoV-2 infected patients with their vaccination status and the concentration of anti-covid IgG antibody specific to receptor-binding domain of S1 protein (RBD).

Methods

A total of 115 COVID-19 patients admitted to the National Hospital of Sri Lanka during the month of August 2021 were enrolled. History and clinical findings were obtained using an interviewer-administered questionnaire. Blood samples for anti-COVID IgG antibody from each patient were collected at the time of admission and analyzed by a two-step chemiluminescent microparticle immunoassay in ADVIA Centaur XP fully automated analyzer.

The association between vaccination status; unvaccinated (UV), partially vaccinated (PV), and fully vaccinated (FV) and disease severity; severe and non-severe was explored with logistic regression models. Correlations of anti-covid IgG antibody levels with each vaccination stage and clinical outcome were analyzed using the Kruskal-Wallis H test and the Wilcoxon rank sum test.

Results

Out of the 115 participants, 71.55% were women and mean age was 50.01 ± 18.73. The number (percentage) of UV, PV and FV were 35 (30.43%), 31(26.96%) and 49(42.6%) respectively. Severe disease was seen in 24 (20.86%). Severe disease was significantly less among FV compared to UV (OR 0.23, 95% CI: 0.05–0.78 p-value 0.01). The relative risk estimate of progression to severe disease in FV, compared with UV was 0.28 (95% CI 0.09 – 0.83, p-value 0.01). Anti-covid IgG antibodies levels were significantly increased with each vaccine dose (p-value <0.001). Association between clinical outcomes with anti-covid IgG antibody against RBD levels could not be demonstrated (Wilcoxon statistic 926, p-value = 0.586).
Conclusionsyrunbxa

These findings are consistent with risk reduction among the fully vaccinated group compared with the unvaccinated group. The antibody level on admission among vaccinated groups didn't predict the clinical outcome.

Keywords

Anti-covid IgG antibody, COVID-19

RP 16

A Descriptive Cross-Sectional Study to Evaluate the Distributions of Vitamin B12 Levels among Samples Received by Medical Research Institute - Colombo for Analysis of Vitamin B12 levels

Panapitiya NP, Nayani MMD, Herath TPK
Medical Research Institute, Colombo

Introduction

Vitamin B12 (VB12) is an essential vitamin and its deficiency (<110 pmol/L) is known to cause serious neurological and haematological complications. However, VB12 excess (>701pmol/L) has also gained attention during recent years due to its association with solid neoplasms,blood (myelodysplastic syndrome) and liver disorders.

Medical Research Institute (MRI) is the sole provider of VB12 testing in the government sector, thus receives samples from most areas of the country. This study was conducted to assess the distribution of VB12 levels among received samples.

Methods

A retrospective descriptive study was conducted to evaluate VB12 levels among the samples of adults aged 18 years and above, received from 01.01.2022 to 31.03.2022 to MRI for analysis of VB12 levels. Statistical analysis of demographic details (from requisition forms) and VB12 results (from laboratory information system) was done using SPSS.

Results

The samples (n=388) were of patients within 18-84 years (45.4% over 60 years) with a female predominance (57.5%). Only 61.4% of the requests had documented indications of which the majority were for anaemia (34.7%) and neurological manifestations (41.4%). Only 0.6% were for patients on VB12 therapy. Pancytopenia and myelodysplastic features were the indications for 7.9%. The majority had normal VB12 levels (73.2 %), deficiency was seen in 2.8% while VB12 excess was evident in 24%. Among patients with anaemia, neurological symptoms, myelodysplastic features and those were without any indication, VB12 excess was more common (29.8%, 13.2% 43.8% and 30.1% respectively) than VB12 deficiency (10.5%, 1.5%, 0 and 6.8% respectively).The pattern was similar among both genders and different age groups as well.

Conclusions

VB12 excess has a much higher occurrence than VB12 deficiency among the received samples. This study highlights the importance of conductance of prevalence studies to confirm the findings and to assess the causes and complications of VB12 excess.

Keywords

Vitamin B12, Deficiency versus excess

RP 17

Bilirubin Interference on Creatinine Assay by Jaffe and Enzymatic Methods and its Elimination by Photolysis

Wickramarathne WRS[1], Jayasinghe S[3], Dharmapala A[2], Dissanayaka DM[3]
[1]Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Peradeniya, Sri Lanka
[2]Department of Surgery, Faculty of Medicine, University of Peradeniya, Sri Lanka
[3]Department of Pathology, Faculty of Medicine, University of Peradeniya, Sri Lanka

Introduction

Chronic kidney disease is a major health problem in Sri Lanka and many studies are done to improve Jaffe and enzymatic methods of serum creatinine assays. Although serum bilirubin is considered an interferant in creatinine assays, experimental results are inconclusive. We aimed to determine the effect of elevated serum bilirubin in the measurement of creatinine by the above methods and to evaluate the effectiveness of photolysis to remove bilirubin before analysis.

Methods

Data were obtained from 49 patients with elevated serum bilirubin levels (Range 1.21 to 42.79 mg/dL). A venous blood sample was taken from each patient and was analysed for bilirubin by the azo-bilirubin method and creatinine by Jaffe and enzymatic methods. Then the samples were subjected to photolysis for 18 hours at 350-550 nm wavelength and re-analysed.

Results

The median bilirubin level reduced from 4.52 mg/dL to 0.25 mg/dL after photolysis. The pre and post-photolysis median creatinine levels were 0.75 mg/dL and 1.05 mg/dL respectively for Jaffe method and 0.71 mg/dL and 0.75 mg/dL respectively for enzymatic method. The Wilcoxon Signed Rank Test indicated that the median post-photolysis test ranks were significantly higher than the median pre-photolysis test ranks for Jaffe ($Z= 5.959$, $p < 0.05$) and enzymatic methods ($Z=5.595$, $p <0.05$).

Conclusions

Even though there is a significant difference between pre and post-photolysis creatinine values in the enzymatic method, it is not clinically significant. Therefore, the enzymatic method is more suitable for measuring serum creatinine in patients with hyperbilirubinemia above the upper reference limit. When the enzymatic method is not available, photolysis of serum can be utilized to eliminate the negative interference and get more accurate results for creatinine.

Keywords

Bilirubin, Creatinine, Jaffe method, Enzymatic method, Photolysis

Abstracts of E-Posters - Case Reports

CASE REPORTS

CR 01 Concurrent Occurrence of an Adrenal Adenoma and a Nonfunctional Pituitary Micro Adenma in a Young Female with Cushing Syndrome

CR 02 Smouldering Multiple Myeloma and Type 1 renal tubular acidosis in a patient with Sjögren's syndrome

CR 03 Two Children with Hyperphenylalaninaemia: Importance of Measuring Tetrahydrobiopter in Levels in Hyperphenylalaninaemia

CR 04 Marvel of Parathyroid Venous Sampling

CR 05 Neuroendocrine Tumour of the Lung Presented with Syndrome of Inappropriate Antidiuretic Hormone Secretion

CR 06 Diagnostic Efficacy of Insulin: C-peptide Ratio in Endogenous Hyperinsulinism

CR 07 Role of Selective Parathyroid Venous Sampling in Patients with Primary Hyperparathyroidism

CR 08 COVID-19 Induced Secondary Haemophagocytic Lymphohistiocytosis

CR 09 Exceptionally High Creatine Kinase Levels in Risperidone-Induced Neuroleptic Malignant Syndrome

CR 10 A Patient with Renal Glycosuria

CR 11 Transient Severe Hypertriglyceridaemia during Therapy for Acute Lymphoblastic Leukaemia

CR 12 The Role of Inferior Petrosal Sinus Sampling in the Diagnostic Localization of Cushing's Disease

CR 13 Myeloma Cast Nephropathy as a Cause of Severe Renal Impairment

CR 14 Hypoxic Hepatitis and Acute Liver Failure in a Patient with Newly Onset Atrial Tachyarrhythmia

CR 15 The Role of Inferior Petrosal Sinus Sampling in ACTH-Dependent Cushing Syndrome

CR 16 A Girl with Early Fanconi Syndrome Harboring a Novel Variant of Wilson's Disease

CR 17 A 66-Year-Old Man with Long Standing Essential Hypertension Presenting with Primary Hyperaldosteronism

CR 18 Treatment Dilemma: The Choice of Assay for Serum Albumin

CR 19 IgM Multiple Myeloma Presenting with Hyper Viscosity Syndrome; Role of Serum Protein Electrophoresis

CR 20 Turner Syndrome-Mosaic (46, XY/45, X) Presenting with Primary Amenor rhoea and Altered Thyroid Functions

CR 21 A Patient with Tyrosinaemia Presenting with Hypophosphataemic Rickets

CR 22 Bilateral Pheachomocytoma in a 29 Year Old Women Presenting with Hy pertension

CR 23 Persistent Hyperamylasaemia: A Rare Case of Macroamylasaemia

CR 24 Pseudoparaprotein Band in Serum Protein Electrophoresis (SPE) of a He modialysis Patient

CR 25 A 12-Year-Old Boy Presenting with Acute-on-Chronic Liver Failure (ACLF)

CR 26 GI Amyloidosis: A Rare Presentation of AL Amyloidosis

CR 27 Malignant Hypertension Biochemically Mimics Renal Artery Stenosis

CR 28 Two Children with Familial Chylomicronaemia Syndrome

CR 29 Familial Hypercholesterolaemia in a Child of Sri Lankan Family

CR 30 Monoclonal Cryoglobulinaemia: Diagnosed by Cryoprecipitate Immunofix ation

CR 31 Role of Adrenal Venous Sampling in the diagnosis of Primary Hyperaldo steronism

CR 32 Adrenal Venous Sampling, Importance of Contralateral Suppression Index in Lateralization of Primary Hyperaldosteronism

CR 33 A Rare Case of Pseudomyxoma Peritoni (PMP) with Elevated Circulating Tumour Markers

CR 34 A Triclonal Gammopathy in a Patient with Multiple Myeloma

CR 35 Use of Drain Fluid Amylase to Predict the Occurrence and Severity of Pan creatic Fistula

CR 36 A Patient with Symptomatic Primary Hyperparathyroidism

CR 37 Diagnostic Dilemma in a Newborn with High Procalcitonin and Multisystemic Involvement

CR 38 Gitelman Syndrome with Acute Lower Limb Weakness

CR 39 A Middle-Aged Female Presenting with Features of Cholestasis – A Case Report of Primary Biliary Cirrhosis

CR 40 A Case Report of Nephrogenic Diabetes Insipidus

CR 41 A Diagnostic Dilemma in a Patient with Hyponatraemia in the Setting of Cholestatic Liver Disease

CR 01

Concurrent Occurrence of an Adrenal Adenoma and a Nonfunctional Pituitary Micro Adenoma in a Young Female with Cushing Syndrome

Liyanagunawardana JE[1], Gunawardane SA[1], Thowfeek ZTM[1], Wickramarachhi AW[2], Katulanda P[2], Katulanda GW[1]
[1]Department of Chemical Pathology, National Hospital of Sri Lanka
[2]Diabetes and Endocrinology Unit, National Hospital of Sri Lanka

Introduction

Elevated levels of endogenous or exogenous glucocorticoids give rise to Cushing syndrome. Cushing syndrome due to endogenous glucocorticoids may be ACTH dependent or independent. ACTH dependent Cushing syndrome is due to pituitary gland tumors or ectopic ACTH secreting tumors while ACTH independent type is due to adrenal tumours. Cushing disease due to pituitary adenomas accounts for a majority of cases of endogenous Cushing syndrome. However, a significant number of pituitary adenomas are nonfunctional and if present in a patient with Cushing syndrome, the true etiology of Cushing syndrome could be masked. This is a rare case of concurrent occurrence of an adrenocortical adenoma and a pituitary micro adenoma which denoted the importance of biochemical investigations.

Case presentation

A 22-year-old woman presented with fatigability and weight gain of recent onset. Clinical examination revealed rounded facies and prominent dorsal fat pads. She had no diabetes mellitus or hypertension. Her overnight (ODST) and low dose (LDDST) dexamethasone suppression tests were not suppressed confirming Cushing syndrome. Magnetic resonance imaging of the brain revealed a possible left sided pituitary micro adenoma. However, her ACTH was repeatedly low (less than 1 pg/mL), with an unsuppressed high dose dexamethasone test and a normal pituitary profile. A contrast enhanced computerized tomography with adrenal protocol identified a right adrenal adenoma. The patient underwent laparoscopic adrenalectomy. She made an uneventful recovery and remained asymptomatic during follow up.

Discussion and conclusions

Biochemical investigations including ODST and LDDST aid in confirming the diagnosis of Cushing syndrome while ACTH play a vital role in differentiating the etiology of Cushing syndrome. Careful evaluation of clinical, biochemical and imaging findings collectively is important to arrive at an accurate diagnosis. Nonfunctional pituitary adenomas could bring about a diagnostic dilemma when present in a patient with Cushing syndrome.

Keywords

Cushing syndrome, nonfunctional pituitary micro adenoma, adrenal adenoma

CR 02

Smouldering Multiple Myeloma and Type 1 Renal Tubular Acidosis in a Patient with Sjögren's Syndrome

Hemarathne MHSL, Madurangi DWDD, De Silva DDS, Gallage BMP, Samarasinghe R
Department of Chemical Pathology, National Cancer Institute, Maharagama, Sri Lanka

Introduction

Sjögren's syndrome (SS) is a rare autoimmune disorder with lymphocytic infiltration of exocrine glands and extra glandular tissue (renal, liver). Renal tubular acidosis type 1(RTA 1) appears several years after the initial presentation of SS patients. SS is associated with other lymphoproliferative disorders like malignant lymphoma, Waldenstrom's macroglobulinemia, but its association with multiple myeloma (MM) is extremely rare.

Case presentation

A 54-year-old female had been diagnosed with Sjögren's Syndrome two years ago with laboratory findings consisting of autoantibodies directed against the Ro/SSA, La/SSB antigen and Anti-Nuclear Antibody (ANA). Recently, she presented with loss of weight, malaise and increased urinary frequency for 1 month duration. Laboratory investigations revealed low serum potassium of 2 mmol/L (3.5-5.3), normal anion gap metabolic acidosis, elevated erythrocyte sedimentation rate (ESR) of 112 mm/1st hr and nephrocalcinosis/nephrolithiasis in the ultrasound scan of the abdomen. She was diagnosed with RTA type 1 associated with SS and further evaluated for high ESR. Serum protein electrophoresis (SPE) revealed a monoclonal band in the gamma region with a paraprotein level of 33.2 g/L and bis-albuminaemia which is of no clinical significance. Bone marrow aspirates had 12% of abnormal plasma cells. She does not have any myeloma defining events or amyloidosis, confirming the diagnosis of smouldering multiple myeloma (SMM). Considering the risk and benefits of this patient, SMM was treated with several cycles of thalidomide, dexamethasone and cyclophosphamide. Monoclonal band disappeared in SPE with the treatment. RTA type 1 is treated with potassium supplementation and sodium bicarbonate.

Discussion and conclusions

Aetiopathogenesis of MM associated with SS is not well understood. Although SS is commonly associated with RTA type 1, MM can rarely present as an isolated RTA type 1 without overt renal impairment. Treatments of SMM are considered after assessing the risks and benefits of disease control, delay in progression and cure.

Keywords

Sjögren's syndrome, smouldering multiple myeloma, renal tubular acidosis type 1

CR 03

Two Children with Hyperphenylalaninaemia: Importance of Measuring Tetrahydrobiopterin Levels in Hyperphenylalaninaemia

Puliyadda TMNK[1], Senanayaka UE[1], Jayawardena A[2], Weerasekara K[2], Dayanath BKTP[1], Blau N[3], Jasinge E[4]
[1]Department of Chemical Pathology, Colombo North Teaching Hospital
[2]Department of Pediatrics, Lady Ridgeway Hospital for Children
[3]Dietmar-Hopp Metabolic Center, University Children's Hospital, Heidelberg, Germany
[4]Department of Chemical Pathology, Lady Ridgeway Hospital for Children

Introduction

Classic phenylketonuria (PKU) and tetrahydrobiopterin (BH4) deficiency both can cause hyperphenylalaninaemia. Hyperphenylalaninaemia per say cannot be used to differentiate these two conditions. Defects in phenylalanine hydroxylase (PAH) cause classic PKU. BH4, a cofactor for PAH is also required in the synthesis of neurotransmitters serotonin and dopamine.

Case Presentation

Case 01

A nine-month-old boy, born to consanguineous parents, presented with hypopigmentation of skin, feeding difficulties and failure to thrive of 6 months duration. Microcephaly, global developmental delay and normochromic normocytic anemia [Hb-9.5 g/dL (11.3-14.1)] were added findings. Increased plasma phenylalanine [931 µmol/L (26-91)] and reduced tyrosine [13 µmol/L (22-115)] levels favored the diagnosis of PKU. The dried blood pterin profile [neopterin - 1.17 nmol/gHb (0.19-2.93), biopterin - 0.56 nmol/gHb (0.08-11.20), biopterin percentage - 32% (16-64.7)] and dihydropteridine reductase activity were normal. A homozygous pathogenic variant identified in PAH gene (c.169-2A>G) confirmed the diagnosis of PAH deficiency. The initiation of phenylalanine free diet improved the condition.

Case 02

A six-month-old girl, born to consanguineous parents, presented with vomiting, dyskinesia, developmental delay and seizures of 3 months duration. There was a history of death of a sibling at age of one year with similar symptoms. On examination, microcephaly and hypopigmented sparse hair were noted. A high phenylalanine level of 1412 µmol/L and low-normal tyrosine level of 38 µmol/L confirmed PKU. Very low neopterin 0.01 nmol/gHb and an undetectable biopterin levels suggested of guanosine triphosphate cyclohydrolase I deficiency. A homozygous pathogenic variant identified in the GCH1 gene (c.551G>A) confirmed the diagnosis of BH4 deficient hyperphenylalaninaemia type B. The symptoms improved with the initiation of L-dopa and phenylalanine free diet.

Discussion and conclusions

The neurotransmitter deficiency found in BH4 deficiency results in a different phenotype and necessitates a different management pathway when compared to classic PKU. Therefore, it is important to assess BH4 levels in children with hyperphenylalaninaemia.

Keywords

Hyperphenylalaninaemia, tetrahydrobiopterin, phenylketonuria

CR 04

Marvel of Parathyroid Venous Sampling

Thowfeek ZTM[1], Siddiqa OMO[1], Wickramarachchi AW[2], Katulanda P[2], Katulanda GW1
[1]Department of Chemical Pathology, National Hospital of Sri Lanka
[2]University Endocrine Unit, National Hospital of Sri Lanka

Introduction

Primary hyperparathyroidism (PHPT) is the uncontrolled production of parathyroid hormone (PTH) resulting in abnormal calcium homeostasis. It commonly affects females and commonly caused by a solitary gland adenoma. This case involves a patient who had single gland adenoma and had normal radiological imaging studies.

Case presentation

A 49-year-old female presented with generalized body aches, fatigue and recurrent fever following total laparoscopic hysterectomy for fibroid uterus. Her examination findings were normal. The laboratory investigations revealed a total calcium of 11.4 mg/dL (8.8-10.2) and a hypophosphataemia of 2.3 mg/dL (2.3-4.7). PHPT was confirmed by elevated PTH level of 177 pg/mL (15-65) and high fractional excretion of calcium of 0.022 (0.01).

Her ultrasound scan of the neck, nuclear medicine scanning with radiolabeled sestamibi, and a four-dimensional (4D) CT scan of neck did not reveal any lesion in parathyroid glands. Then the patient underwent bilateral parathyroid venous sampling which revealed an elevated PTH level in the common inferior thyroid vein, with a central to peripheral ratio of 17, localizing the lesion to lower part of thyroid bed. The patient underwent parathyroidectomy, during which intraoperative PTH showed complete resection of source of PTH and later histology revealed a parathyroid adenoma of left inferior gland.

Discussion and conclusions

The treatment of PHPT is surgical resection of the hyper functioning parathyroid tissue. The preoperative localization of the adenoma is critical in this regard. Parathyroid venous sampling is an effective tool in the evaluation of parathyroid adenoma, particularly in the setting of hyperparathyroidism and negative non-invasive imaging. It is a diagnostic method that should definitely be considered in the identification of unlocalized adenoma owing to its potential to prevent repeated surgical operations and make surgery minimally invasive, even though it is an invasive technique itself.
This case illustrates the importance of parathyroid venous sampling when imaging studies are inconclusive.

Keywords

Hyperparathyroidism, adenoma, parathyroid venous sampling

CR 05

Neuroendocrine Tumour of the Lung Presented with Syndrome of Inappropriate Antidiuretic Hormone Secretion

Hemarathne MHSL, Madurangi DWDD, De Silva DDS, Gallage BMP, Samarasinghe R
Department of Chemical Pathology, National Cancer Institute, Maharagama, Sri Lanka

Introduction

Syndrome of inappropriate secretion of anti-diuretic hormone (SIADH) is associated with hyponatraemia, low serum osmolality, high urine osmolality and natriuresis in the absence of renal, adrenal, thyroid pathologies. SIADH is frequently associated with pulmonary diseases such as pneumonia, tuberculosis and cerebral diseases such as encephalitis and head injury. SIADH has been reported as a paraneoplastic phenomenon accompanying several malignancies. The tumour most frequently associated with SIADH is small-cell lung cancer and other associations are tumours of brain, prostate, pancreas, bladder, head and neck.

Case presentation

A 64-year-old patient presented with vomiting, generalized body weakness, confusion for 1 week duration. On examination, he is euvolaemic and found to have reduced air entry on the right lower and middle zone. Initial evaluation revealed sodium of 115 mmol/L (136-145), potassium of 3.9 mmol/L (3.5-5.3), creatinine of 89 µmol/L (53-106) and random plasma glucose of 188 mg/dL. Further evaluation of hyponatraemia revealed serum osmolality of 249 mosm/KgH2O (285-295), urine osmolality of 665 mosm/KgH2O (50-1200 mosm/KgH2O) and urine sodium of 90 mmol/L (<20mmol/L) suggestive of SIADH. He had a normal thyroid profile with normal 9 am cortisol level. The chest radiograph showed right sided pleural effusion and the contrast enhanced computed tomography (CECT) of the chest showed a right sided pleural lesion with multiple lymphadenopathies. The pleural biopsy showed deposits from a neuroendocrine carcinoma, likely to be of pulmonary origin. His chromogranin A level was high [2003 µg/L (<100)] supporting the diagnosis of neuroendocrine tumour. Patient was treated with multiple cycles of chemotherapy drugs.

Discussion and conclusions

Hyponatraemia is rarely encountered as an initial presentation in neuroendocrine tumours. Therefore, malignancy should be suspected in the diagnostic work up of SIADH. Hyponatraemia has been identified as a negative prognostic factor in hospitalized patients and those with advanced-stages of malignancies. Normalization of sodium suggests response to chemotherapy. Recurrent or refractory hyponatraemia suggestive of progression of the neoplastic process.

Keywords

SIADH, hyponatraemia, neuroendocrine tumour, paraneoplastic syndrome

CR 06

Diagnostic Efficacy of Insulin: C-peptide Ratio in Endogenous Hyperinsulinism

Thowfeek ZTM, Thushyanthi P, Wijayasuriya WAM, Gunawardena SA, Katulanda GW
Department of Chemical Pathology, National hospital of Sri Lanka

Introduction

Endogenous hyperinsulinism is due to insulinoma, non-insulinoma pancreatogenous hypoglycaemia syndrome (NIPHS), or antibodies to insulin. Diagnosis is based on dynamic tests such as supervised 72-hour fast. A case series consistent with endogenous hyperinsulinism is presented here.

Case presentation

Case 1

A 20-year-old woman presented with seizures, unconsciousness, and hypoglycaemia (capillary glucose of 19 mg/dL) and relived following administration of intravenous dextrose. A 72-hour fast revealed insulin: C-peptide ratio <1 in the presence of hypoglycaemia. Imaging suggested an insulinoma. Histology following resection confirmed a malignant insulinoma. She became asymptomatic after the surgery.

Case 2

A 68-year-old woman with Grave's disease on carbimazole presented recurrent hypoglycemia (capillary glucose of 40 mg/dL) unresponsive to intravenous dextrose had insulin: C-peptide ratio of 8 following a 72-hours fast. Imaging was inconsistent with endogenous hyperinsulinism. Very low recovery of insulin following polyethylene glycol precipitation and positive anti-insulin antibodies >300 U/mL (<12) were suggestive of insulin autoimmune syndrome (IAS). The patient improved symptomatically following cessation of carbimazole.

Case 3

A 34-year-old man with symptoms of paroxysmal hypoglycaemia relieved by oral carbohydrates had endogenous hyperinsulinism confirmed with insulin: C-peptide <1 following a 72-hour fast. Computed tomography of the abdomen was normal and selective arterial catherization with calcium stimulation was inconclusive in localizing the tumor. Endoscopic ultrasound scan of pancreas localized a mass in the head of pancreas. Surgical enucleation of the tumor was planned.

Case 4

Recurrent hypoglycaemia and seizures in a 56-year-old man with inflammatory bowel disease presented with recurrent hypoglycaemia not responding to oral carbohydrates and intravenous dextrose. The 72-hour fast revealed an insulin: C-peptide ratio of 5 when capillary glucose was 15 mg/dL. Negative radiological findings with a positive anti-insulin antibody test suggested sulphasalazine induced IAS.

Discussion and conclusions

This emphasizes that biochemical diagnosis using insulin: C-peptide ratio in the presence of hypoglycemia is key to the diagnosis in adults presenting with neuroglycopenia.

Keywords

Insulin: C-peptide ratio, endogenous hyperinsulinism

CR 07

Role of Selective Parathyroid Venous Sampling in Patients with Primary Hyperparathyroidism

Sujeeva N, Samarakoon SMPP, Balasooriya BMCM, Katulanda GW
Department of chemical Pathology, National hospital of Sri Lanka

Introduction

The incidence of primary hyperparathyroidism has increased recently probably due to increased access to biochemical investigations. In some instances, imaging may not support the biochemical diagnosis. Selective parathyroid venous sampling (PVS) has become very useful in such instances with the sensitivity and specificity of 76% and 88% respectively. Preoperative localization of the parathyroid lesion is mandatory due to improved management by development of minimally invasive surgical procedures.

Case presentation

In this case series, 4 patients referred to the Chemical Pathology department at National Hospital of Sri Lanka with the clinical features of hypercalcaemia are presented. Their symptoms and signs ranged from constipation, acute pancreatitis, Colles fracture and nephrocalcinosis. All had the biochemical diagnosis of primary hyperparathyroidism with hypercalcaemia, hypophosphataemia, and elevated parathyroid hormone (PTH). Ultrasound scan of neck, contrast enhanced computed tomography, 4-dimensional computed tomography and Tc-99m Sestamibi scan were carried out in all 4 patients, and one patient underwent PTH on needle wash during fine needle aspiration cytology.

Case 1

Needle wash PTH levels were discordant to imaging findings. PVS localized the lesion to left middle and inferior thyroid veins suggesting left inferior parathyroid adenoma which was confirmed by histology post-operatively.

Case 2

Sestamibi scan revealed increased uptake in left inferior thyroid lesion while other imaging studies were negative. PVS localized the lesion to same area and was confirmed later during surgery.

Case 3

All imaging studies were negative. PVS localized the lesion to right inferior and left superior thyroid veins suggestive of gland hyperplasia. Patient opted for medical management as she refused surgery.

Case 4

All imaging studies were negative. PVS localized the lesion to right middle thyroid vein. Patient is under medical management with active surveillance as she has multiple comorbidities.

Discussion and conclusions

PVS is helpful in identifying and localizing the parathyroid lesions in primary hyperparathyroidism when imaging studies are indecisive.

Keywords

Parathyroid venous sampling, primary hyperparathyroidism

CR 08

COVID-19 Induced Secondary Haemophagocytic Lymphohistiocytosis

Hemarathne MHS[1], Katulanda GW[2]
[1]Department of Chemical Pathology, National Cancer Institute, Maharagama, Sri Lanka
[2]Department of Chemical Pathology, National Hospital of Sri Lanka

Introduction

The Coronavirus disease 2019 (COVID-19) became a public health problem in Sri Lanka and worldwide. Severe COVID -19 infection is a systemic inflammatory condition that can lead to a cytokine storm and secondary haemophagocytic lymphohistiocytosis (HLH) which is a serious complication.

Case presentation

A 12-year-old boy was admitted with high fever (103°F), headache and reduced activity for seven days. He was pale and found to have bilateral cervical lymphadenopathy. SARS-CoV-2 specific RNA was positive confirming the COVID 19 infection. His investigations revealed leukopenia, anemia, aspartate aminotransferase of 457 U/L (0-40), alanine aminotransferase of 164 U/L (9-48), CRP of 106.3 mg/L (<5) and ESR of 100 mm/1st hour. He had persistent cytopenia and his condition was deteriorating. Further investigations revealed hypofibrinogenaemia (0.736 g/L), hypertriglyceridaemia (5.02 mmol/L), increased ferritin level (5.02 mmol/L), high D-Dimer (>4800 ng/mL), high procalcitonin (19.82 ng/mL) and high lactate dehydrogenase (9447 U/L) which led to a probable diagnosis of HLH. Bone marrow biopsy showed active bone marrow with marked haemophagocytosis, compatible with HLH. According to the HLH-2004 guidelines, six out of eight criteria for diagnosis of HLH were present. The patient gradually improved both clinically and biochemically with intravenous immunoglobulin and dexamethasone therapy.

Discussion and conclusions

Early diagnosis of HLH is mandatory to improve treatment outcome and minimize irreversible organ damages. However, the diagnosis of HLH is challenging due to nonspecific clinical features and laboratory findings. Ferritin and procalcitonin are markers of cytokine storm of severe COVID-19. Secondary HLH is usually resistant to immunochemotherapy and can be treated with allogeneic haematopoietic stem cell transplant.

Keywords

Secondary haemophagocytic lymphohistiocytosis, cytokine storm, procalcitonin, ferritin

CR 09

Exceptionally High Creatine Kinase Levels in Risperidone-Induced Neuroleptic Malignant Syndrome

Siddiqa OMO, G W Katulanda
Department of Chemical Pathology, National Hospital of Sri Lanka

Introduction

Neuroleptic malignant syndrome (NMS) is an antipsychotic-induced reaction characterized by hyperthermia, altered consciousness, autonomic instability and rigidity with elevated creatine kinase (CK) around 2000 to 15,000 IU/L due to myonecrosis. Risperidone is an atypical antipsychotic drug which has a wide range of side effects, including neuroleptic malignant syndrome.

Case presentation

A 16-year-old girl treated with risperidone (1 mg/day for 5 days) for depression, was admitted with behavioral changes for a week. She was otherwise healthy and was not on any other medications. On admission, she was febrile, had upper limb rigidity with Glasgow Coma Scale score of 12. Rest of her systemic review was normal.

On day 1, she had CK of 3,844 IU/L (25-174), which increased to 53,467 IU/L on day 5, and gradually decreased to 182 IU/L on day 21 following successful treatment. Other investigations revealed metabolic alkalosis, elevated transaminases, hyperkalemia, hypocalcaemia, and neutrophilic leukocytosis. Her serum creatinine, blood urea, CRP, iron studies, urine analysis and spinal fluid analysis were normal. Body fluid cultures were sterile.

The patient was diagnosed with risperidone-induced NMS and managed with risperidone withdrawal, oral lorazepam, paracetamol, tepid sponging and adequate hydration.

Discussion and conclusions

High CK values are commonly reported in NMS and massive asymptomatic CK elevation (MACKE), but the rise is commonly around 2000 to 15,000 IU/L. Since 1960 (The first reported case of NMS by Delay et al), only two cases were reported with CK more than 50,000 IU/L in NMS, but neither of them was risperidone-induced.

This is the first reported case with exceptionally high CK levels more than 250 fold following short term treatment with a low dose of risperidone monotherapy, despite this drug's less anti-dopaminergic action.

Keywords

Neuroleptic malignant syndrome, Creatine kinase, Risperidone

CR 10

A Patient with Renal Glycosuria

Sampath RW, Hettihelge UID, Karunarathna KGSC, Vithanage TK
Department of Chemical Pathology, Teaching Hospital, Ratnapura

Introduction

Glycosuria is defined as the presence of detectable amount of glucose in urine. Familial Renal Glycosuria (FRG) is a primary defect of proximal tubular reabsorption which results in isolated glycosuria with normal plasma glucose.

Case presentation

A 46-year-old female was found to have glycosuria with normal plasma glucose levels and glucose tolerance. She had polyuria and nocturia of four months duration. Family history of similar illnesses or history of consanguinity were not noted. She denied any childhood illnesses and was not on any long term medications. Physical examination did not reveal any pathological findings. Her urinalysis showed 3+ of sugar which was confirmed by repeated testing. Urine sugar was 297.6 g/dL when fasting plasma glucose level was 4mmol/l and HbA1c was 5.1%. Her serum Insulin, C-peptide, creatinine, ceruloplasmin and electrolytes were normal. Creatinine clearance and urinary excretion of calcium, phosphate, electrolytes and uric acid were normal. Urine microscopy shows no abnormality. The pregnancy test was negative. Arterial blood gas showed normal pH, bicarbonate and lactate levels. The patient was diagnosed with renal glycosuria, however mutation analysis of SLC5A2 gene was not done.

Discussion and conclusion

Blood glucose is filtered by the glomerulus and almost all the filtered glucose is reabsorbed at the proximal tubule. More than 90% of reabsorption occurs through SGLT2 mediated secondary active transport. Glycosuria can be due to either high plasma glucose level which exceed the renal threshold or any abnormality of reabsorption of filtered glucose at PCT level. Diabetes mellitus is the most common cause of glycosuria and other common causes are pregnancy, Fanconi's syndrome, Wilson's disease, interstitial nephritis, cystinosis, tyrosinemia and drugs such as SGLT - 2 inhibitors. All other possible causes which were mentioned above should be excluded and mutation analysis of SLC5A2 should be done to diagnose of FRG. FRG is a benign condition and does not require any specific therapy.

Keywords

Renal glycosuria, SLC5A2 gene

CR 11

Transient Severe Hypertriglyceridaemia during Therapy for Acute Lymphoblastic Leukaemia

Gallage BMP, Premathilaka SKYV, Samarasinghe R
Department of Chemical Pathology, National Cancer Institute, Maharagama

Introduction

PEG-L- Asparaginase is a mainstay chemotherapeutic drug in treating B cell lymphoblastic leukaemia which hydrolyses the blood asparagine to aspartic acid and ammonia. It is an effective chemotherapeutic drug but may cause many side effects, anaphylaxis (20%), thromboembolic events (2-11%) and pancreatitis (4-7%). The toxicity depends on the dose and the duration of the treatment.

Case presentation

A 15-year-old girl with B cell lymphoblastic leukaemia was started on induction chemotherapy which contained PEG-L- asparaginase 3250 IU, given on day 4, 9, 12, 15, 18, 21, 24, 27. It was an adjusted dose for the body surface area, 800 IU/m2. On the 7th day her fasting lipid profile revealed elevated total cholesterol 1033.0 mg/dl (130-200), triglycerides 3055 mg/dL (<150) and reduced HDL 25 mg/dL (40-65). Other biochemical investigations revealed mildly increased total bilirubin 3.24 mg/dL (0.3-1.2) and moderately elevated transaminases ALT 274 IU/L (0-40), AST 83 IU/L (0-40). Uric acid was significantly elevated, 1305 µmol/L (208-426). She was started with lipid lowering drugs, dietary modifications and continued chemotherapy. Two weeks after completing the induction chemotherapy her triglyceride level normalized with other biochemical parameters.

Discussion and conclusions

The mechanism of asparaginase induced hypertriglyceridaemia is caused by decreasing the lipoprotein lipase (LPL) activity and clearance of triglycerides. LPL inhibition is due to decreased protein synthesis in the liver with low asparagine availability. Hypertriglyceridemia in asparaginase treatment is common and can be complicated as acute pancreatitis. Therefore, monitoring of blood lipid levels, lipid lowering treatment with the start of the chemotherapy will prevent further complications and prevent unnecessary treatments and interventions.

Keywords

Asparaginase, hypertriglyceridaemia

CR 12

The Role of Inferior Petrosal Sinus Sampling in the Diagnostic Localization of Cushing Disease

Gallage BMP[1], Sumanatilleke M[2], Katulanda GW[3]
[1]Department of Chemical Pathology National Institute of Cancer Maharagama
[2]Diabetes and Endocrinology Unit National Hospital of Sri Lanka
[3]Department of Chemical Pathology, National Hospital of Sri Lanka

Introduction

Cushing syndrome is a condition which is characterized by hypercortisolism of exogenous or endogenous origin. Endogenous Cushing syndrome is classified according to adrenocorticotropic hormone (ACTH) dependency. ACTH dependent Cushing syndrome is due to ACTH secreting pituitary adenomas (Cushing disease), ectopic ACTH secreting tumors or ectopic corticotropin- releasing hormone (CRH) syndrome. This is a case report of a patient with Cushing disease.

Case presentation

A 42-year-old woman with poorly controlled diabetes presented with recent onset weight gain and significant proximal muscle wasting. Investigations revealed elevated level of 9 am cortisol of 632 nmol/L (166-507). Overnight and Low dose dexamethasone suppression tests were not suppressed and were suggestive of Cushing syndrome. Her ACTH was 99.2 pg/mL (10-50) and high dose dexamethasone suppression test showed suppression of more than 50 % of the basal value confirming Cushing Disease. Pituitary magnetic resonance imaging revealed right sided pituitary micro adenoma. Non-stimulated bilateral Inferior Petrosal sinus sampling (IPSS) further confirmed the diagnosis of Cushing disease by having IPS: peripheral ACTH ratio of 12.4 (<2.0) bilaterally. The patient underwent trans- sphenoidal resection of ACTH secreting pituitary adenoma and the histology was compatible with pituitary adenoma. Post-operative cortisol was 68 nmol/L and the patient was started on oral steroids replacement therapy. She is being followed up for adequacy of oral hydrocortisone and recurrence of Cushing disease.

Discussion and conclusions

IPSS is considered the gold standard test for confirming Cushing disease because pituitary incidentaloma are not uncommon. IPSS may help in localizing lesions in the pituitary though it didn't in this patient. The sensitivity of 100% and specificity of 100% of the IPSS can be achieved by CRH stimulation.

Keywords

Cushing disease, inferior petrosal sinus sampling

CR 13

Myeloma Cast Nephropathy as a Cause of Severe Renal Impairment

Balasooriya BMCM, Sujeeva N, Samarakoon SMPP, Katulanda GW
Department of Chemical Pathology, National Hospital of Sri Lanka

Introduction

Myeloma cast nephropathy is one of the common renal pathologies seen in multiple myeloma and is due to the presence of circulating free light chains (FLC). When concentration in glomerular filtrate exceeds the capacity of proximal tubular reabsorption, FLC precipitate within distal tubules causing obstruction and damage. Though, the course of cast nephropathy is usually gradual, that can be rapid causing acute and severe renal damage as in the case we report here.

Case presentation

A 47-year-old woman with primary hypothyroidism and newly diagnosed chronic kidney disease (stage 5) was admitted with lethargy, loss of appetite and vomiting for two weeks. Initial Investigations revealed impaired renal functions, nephrotic range proteinuria, normocytic, normochromic anaemia, thrombocytopaenia and mild to moderate rouleaux formation in the blood picture. Renal biopsy revealed features compatible with cast nephropathy. Immunofluorescence staining showed strong Lambda granular staining in the glomerular capillary walls, interstitial walls and blood vessel interstitium. An abnormal monoclonal band comprising Lambda chains was detected in the gamma region in serum protein immunofixation electrophoresis. Serum free lambda chains were increased. A bone marrow biopsy demonstrated the presence 50% of plasma cells. A diagnosis of light chain deposition disease with cast nephropathy owing to Lambda light chain myeloma was made. Immediate haemodialysis was started as the patient had acute on chronic kidney disease. Patient recovered from the acute stage and was referred to the oncology unit for further management.

Discussion and conclusions

This report highlights the significant challenges that remain in the diagnosis of light chain deposition disease with cast nephropathy. MCN is a medical emergency, and a timely diagnosis is crucial to initiate treatment early to reverse acute kidney damage and reduce FLC concentrations.

Keywords

Myeloma cast nephropathy, free light chains

CR 14

Hypoxic Hepatitis and Acute Liver Failure in a Patient with Newly Onset Atrial Tachyarrhythmia

Balasooriya BMCM, Sujeeva N, Samarakoon SMPP, Katulanda GW
Department of Chemical Pathology, National Hospital of Sri Lanka

Introduction

Hypoxic hepatitis (HH) is a clinical, biological and histological syndrome. HH is characterized by a rapid, marked and transient increase in the aminotransferase level. Pathophysiology of HH is multifactorial. It is preceded by reduction in the oxygen supply to the liver in the presence of pre- existing comorbidities associated with chronic liver hypoxia. Cardiac failure, circulatory or septic shock, respiratory failure account for more than 90% of the cases of HH. Here, we describe a patient with hypoxic hepatitis in the setting of heart failure due to newly onset tachyarrhythmia.

Case presentation

A 59-years-old male patient with a history of diabetes mellitus for five years presented to the emergency department with palpitations, shortness of breath, and altered level of consciousness for 2 days. He was found to have tachyarrhythmia on examination. Echocardiographic tracing showed atrial ectopics, atrial tachycardia and atrial flutter with 2:1 block. 2D echocardiogram concluded severe left and right ventricular dysfunction. During hospital stay, he developed an abrupt rise in his liver enzymes with deranged coagulation profile. Other causes of acute liver failure were excluded. With the haemodynamic support and the control of the tachyarrhythmia he improved within the following three weeks with normalization of transaminases and liver function tests. The patient is being followed up for adequacy of drug management, and the recurrence of tachyarrhythmia.

Discussion and conclusions

An abrupt rise in liver enzymes without a clear etiology can be due to HH with underlying cardiac failure, respiratory failure and septic shock. This case report highlights that cardiac dysfunction, an important clinical etiology, should not be overlooked as a cause of hypoxic hepatitis.

Keywords

Hypoxic hepatitis, acute liver failure, atrial tachyarrhythmia

CR 15

The Role of Inferior Petrosal Sinus Sampling in ACTH-Dependent Cushing Syndrome

Balasooriya BMCM, Sujeeva N, Thowfeek ZTM, Prashanthan S, Katulanda GW
Department of Chemical Pathology, National hospital of Sri Lanka

Introduction

Localization of the source of ACTH secretion is critical in timely management of ACTH dependent Cushing syndrome (CS). Here we present a case series of ACTH dependent Cushing syndrome.

Case presentation

Case 1

A 24-year-old man, with diabetes mellitus and hypertension presented with proximal muscle weakness and hyperpigmentation. Investigations were consistent with ACTH dependent CS. Imaging revealed left sided pituitary micro adenoma. Non-stimulated bilateral inferior petrosal sinus sampling (IPSS) confirmed the left sided ACTH-secreting pituitary adenoma. Histology showed a pituitary adenoma.

Case 2

A 64-year-old man with diabetes and hypertension, presented with proximal muscle weakness. Initial work-up revealed ACTH dependent CS. Imaging was unrevealing. IPSS confirmed the diagnosis of ectopic ACTH secretion. Serum Chromogranin A and 24-hour urine 5-hydroxyindoleacetic acid levels were elevated. Unfortunately, the patient expired due to severe sepsis before confirming a source producing
ACTH.

Case 3

A 58-year-old-female with diabetes, presented with proximal muscle weakness and facial plethora. Investigations revealed ACTH dependent CS. Imaging was unrevealing. IPSS localized an ACTH secreting pituitary tumor. Histology revealed a pituitary adenoma with high mitotic index.

Case 4

A 55-year-old female with new onset diabetes, presented with progressive weight gain, proximal muscle weakness and truncal obesity. Biochemical evaluation revealed ACTH dependent CS. Imaging was normal. IPSS confirmed an ACTH producing pituitary source. Histology suggested a pituitary adenoma. All other three patients had resolution of symptoms post-operatively. They are being followed up for recurrence.

Discussion and conclusions

IPSS has shown high diagnostic accuracy in differentiating Cushing disease from ectopic ACTH secretion. It is considered the gold standard in diagnosing Cushing disease.

Keywords
IPSS, Cushing syndrome

CR 16

A Girl with Early Fanconi Syndrome Harboring a Novel Variant of Wilson Disease

Mudunkotuwa SSK[1], Dr Gunapala R[2], Jasinge E[2]
[1]Department of Chemical Pathology, Medical Research Institute, Colombo
[2]Department of Paediatric, Lady Ridgeway Hospital for Children Colombo, Sri Lanka.
[3]Department of Chemical Pathology, Lady Ridgeway Hospital for Children, Colombo

Introduction

Copper (Cu) is essential, but it's toxic in excess. Wilson disease (WD) is an inherited autosomal recessive disorder of Cu metabolism due to mutant ATP7B gene located on the chromosome 13q14, leading to brain degeneration, liver pathology and Kayser-Fleischer (KF) rings. We present a patient with early Fanconi syndrome harboring a novel variant of WD.

Case presentation

A 9-year-old girl with liver failure was found to have KF rings, low serum Cu, ceruloplasmin and high urine Cu. Leipzig score of > 4 established the diagnosis of WD. Two heterozygous pathogenic variants, NM_000053.2:c.3236G>T p. (Cys1079Phe), (Variation ID: 424618) has previously been described for WD, and Novel NM_000053.2: c.2438T>G p. (Leu813) a likely pathogenic premature stop codon variant, in ATP7B gene confirmed the diagnosis. The mild metabolic acidosis, hypouricaemia and hypophosphatemia, elevated phosphate, uric acid (UA) and protein in urine suggested early phase of Fanconi syndrome, a known complication of WD. Early diagnosis, provision of copper chelation and monitoring at specialized clinics, led to gradual improvement and minimizing further complications.

Discussion and conclusions

The clinical hallmarks of WD are KF ring and Cu accumulation in the liver. As there is no single diagnostic test for WD, a scoring system increases diagnostic accuracy. Even though confirmatory genetic diagnosis using direct molecular testing is also difficult as >500 mutations have been identified, genetic studies are now more accessible, and clinicians can avoid invasive tests such as liver biopsy. The clinical picture is varying among different people. However, the renal involvement in WD is not uncommon and expression of the gene in renal tubules is confirmed. Copper deposition damages tubule and leads to excessive excretion of HCO3, UA, PO4, protein and sugar as well. Still genotype–phenotype association in the disease course is not fully established and demand for further genetic studies and case reporting.

Keywords

Wilson Disease, Fanconi syndrome, novel variant

CR 17

A 66-Year-Old Man with Long Standing Essential Hypertension Presenting with Primary Hyperaldosteronism

Madurangi DWDD[1], Thowfeek ZTM[1], Balasooriya BMCM[1], Pathirana NSW[2], Pathmanathan S[2], Katulanda GW[1]

[1]Department of Chemical Pathology, National Hospital Sri Lanka

[2]Diabetes and Endocrinology Unit, National Hospital Sri Lanka

Introduction

Primary hyperaldosteronism is a common cause of secondary hypertension in young adults. It is caused by aldosterone producing adenoma, bilateral or unilateral adrenal hyperplasia, familial hyperaldosteronism, and adrenal carcinoma. It is crucial to identify exact etiology as management greatly varies with this. We present a case of resistant hypertension due to adrenal adenoma in an elderly patient.

Case presentation

A 65-years-old man with well controlled hypertension and diabetes mellitus for 15 years was admitted to a medical ward with a blood pressure of 180/100 mmHg. His blood pressure control has been unsatisfactory during the last two years despite treatment with optimal doses of nifedipine, carvedilol, enalapril and hydrochlorothiazide. Basic investigations were normal except for a mild hypokalaemia. On further evaluation he had a serum aldosterone level of 557 pmol/L, serum renin level of 1.3 µIU/mL and aldosterone to renin ratio of 428.46. Contrast enhanced computed tomography revealed left adrenal lesion suggestive of an adenoma. Patient defaulted after one failed adrenal venous sampling and presented one year after to reveal deteriorating renal functions and imaging. Repeat adrenal venous sampling confirmed the diagnosis of an aldosterone secreting lesion in the left adrenal. Laparoscopic adrenalectomy was performed and had uneventful recovery with a blood pressure of 150/90 mmHg.

Discussion and conclusions

Unilateral adrenal adenomas can be treated with adrenalectomy because blood pressure and hypokalaemia improve in nearly 100% of patients post operatively. Adrenal venous sampling is the gold standard in the localization of aldosterone secreting lesions. This case conveys the importance of having a high degree of suspicion to consider primary hyperaldosteronism even in older patients with a diagnosis of essential hypertension, when hypertension becomes resistant. Proper diagnosis of primary hypertension with etiology is important as early detection and correct treatment can greatly minimize the complications.

Keywords

Primary hyperaldosteronism, adrenal venous sampling, aldosterone renin ratio

CR 18

Treatment Dilemma: The Choice of Assay for Serum Albumin

Thowfeek ZTM, Hemarathne MHSL, Arooran T, Balasooriya N, Jasinge E
Department of Chemical Pathology, Lady Ridgeway Hospital for Children
Colombo

Introduction

A variety of methods are used to determine serum albumin. Photometric methods are the most common, with albumin reacting with an organic dye to form an albumin-dye complex. These methods are simple to design, easy to automate, fast and cheap. Bromocresol green (BCG) and Bromocresol purple (BCP) are used almost exclusively today.

Case presentation

A 2-year-old male child presented with swelling over face which initially started around peri-orbital area more during morning and gradually progressed to face which decreased by evening with low urinary output. Based on clinical presentation and laboratory investigations he was diagnosed with nephrotic syndrome and commenced with high caloric and protein diet, oral prednisolone, furosemide, and intravenous albumin. His local laboratory serum albumin level remained persistently low 6 g/L (35-50) with BCP method despite of adequate treatment. However private sector serum albumin results varied between 15-20 g/L (35-50) with BCG method. The nephrology team notified the laboratory of the disparity, and they preferred the results from the private sector.

Discussion and conclusions

In order to contemplate the issue a comparison study was conducted between BCP and BCG procedures. The simple linear regression analysis indicated a good correlation between both methods. A significant positive bias was noted in the BCG method in comparison to BCP during Bland Altman analysis which concluded the cause of disparity between laboratories. This case was an eye opener to clinicians, to be aware of numerous methods used for serum albumin estimation and the BCP method is more specific for albumin, unlike BCG, as it does not overestimate albumin in kidney disease patients.

Keywords

Serum albumin, nephrotic syndrome, Bromocresol green, Bromocresol purple

CR 19

IgM Multiple Myeloma Presenting with Hyperviscosity Syndrome; Role of Serum Protein Electrophoresis

Kulasinghe MSN[1], Premawansa G[2], Dayanath BKTP[1]
[1]Department of Chemical Pathology, Colombo North Teaching Hospital, Ragama, Sri Lanka
[2]Medical unit, Colombo North Teaching Hospital, Ragama, Sri Lanka

Introduction

IgM multiple myeloma is a rare haematological malignancy which occurs in approximately 0.5% of all myelomas. Hyperviscosity syndrome is more commonly associated with Waldenstrom macroglobulinaemia. However, it can rarely be associated with multiple myeloma.

Case presentation

An 80-year-old male presented with three episodes of transient visual impairment, headache and dizziness for 1-month duration. He was a diagnosed patient with hypertension and was on anti-hypertensives for 9 years. There was no history of back pain and his physical examination was unremarkable. His investigations revealed moderate anaemia (Haemoglobin - 9.2 mg/dL) with normal platelets and white cell counts. His ESR was 110 mm/1st hour. Urinalysis showed the presence of Bence Jones proteins. His CT angiography of the brain was unremarkable except for the age related changes. His serum total calcium level was slightly elevated 2.8 mmol/L. (2.1-2.7) Furthermore, his renal function tests were deranged; Serum creatinine 202 µmol/L. (62-115) His total protein levels were elevated; 8.5 g/dL (6.0-8.3), with elevated globulin fraction. His serum protein electrophoresis showed a monoclonal band in the fast gamma region (M band concentration - 5.8 g/dL), where immune-typing revealed IgM Kappa. He underwent a bone marrow biopsy which showed bone marrow plasma cells >10%. However, his skeletal survey showed no lytic lesions.

Discussion and conclusions

Neurological deficits and visual disturbances seen in this case are primary clinical manifestations of hyperviscosity syndrome, which can rarely be seen in multiple myeloma. Symptoms of hyperviscosity can occur when IgM levels reach more than 4 g/dL. High blood viscosity causes sluggish blood flow in micro vascular circulation leading to hypo-perfusion of tissues causing clinical manifestations. With the evidence of bone marrow biopsy and "CRAB" features the diagnosis of multiple myeloma was established. This case highlights the importance of performing serum protein electrophoresis together with immune phenotyping in a patient presenting with features of hyper viscosity syndrome.

Keywords

Hyper viscosity syndrome, IgM multiple myeloma, serum protein electrophoresis

CR 20

Turner Syndrome-Mosaic (46, XY/45, X) Presenting with Primary Amenorrhoea and Altered Thyroid Functions

Kulasinghe MSN[1], De Silva P[2], Dayanath BKTP[1]
[1]Department of Chemical Pathology, Colombo North Teaching Hospital, Ragama, Sri Lanka
[2]Obstetric unit, Colombo North Teaching Hospital, Ragama, Sri Lanka

Introduction

Turner syndrome occurs in 1 in 2000 live births of female infants and caused by the absence of one set of genes from the short arm of one X chromosome. About 50% of Turner syndrome have monosomy X (45, XO) and the other 50% have a mosaic chromosomal component. They usually present with primary amenorrhoea secondary to premature ovarian failure. Patients with 45X/46XY mosaicism can present with a variety of phenotypes ranging from gonadal dysgenesis to genital ambiguity.

Case presentation

A 17-year-old girl was presented to the gynaecology clinic due to primary amenorrhoea, day time sleepiness and weight gain. On examination she was overweight (BMI-29.1) with a short stature. Furthermore, she had a wide carrying angle and acanthosis nigricans. Her basic investigations were within normal limits except for high FBS levels (131.2 mg/dL). Her HbA1C was 6.9% (<5.6%), establishing a diagnosis of diabetes mellitus. Hypothyroidism was diagnosed as her TSH was >100 mIU/L (0.465-4.68), free T4 -2.7pmol/L (10-28.2), and was started on Metformin and Thyroxin. Her initial prolactin level was 430 mIU/L which became normal following initiation of thyroxin. Her FSH was 21.5 mIU/mL, LH was 15.3 mIU/mL, both in post-menopausal range. Her estradiol level was low 9.93 pg/mL (Premenopausal 30-400 pg/mL), and testosterone level was 0.44 nmol/L (0.52-2.43). Although her ultra sound scan abdomen showed a normal uterus, bilateral ovaries were not visualized. Her genetic studies revealed a karyotype of 46X, Y/45X (mosaic for two cell lines) and a diagnosis of Turner syndrome was established.

Discussion and conclusions

Based on her clinical presentation, hypothyroidism was a differential diagnosis. However, with elevated FSH, LH and low estradiol levels, favorable examination and imaging findings, cytogenetic studies were carried out. Diagnosis of Turner syndrome was confirmed by the presence of 45, X cell line. She was mosaic for 46X, Y/45X cell lines. In Turner syndrome, autoimmune hypothyroidism is common (prevalence 10-30%) and patients who got Y chromosomes are at increased risk of germ cell tumors, so prophylactic gonadectomy is recommended.

Keywords

Turner syndrome, mosaicism, hypothyroidism

CR 21

A Patient with Tyrosinaemia Presenting with Hypophosphataemic Rickets

Madurangi DWDD[1], Chinthanie KKS[1], Jaysena KLSPKM[1], Fernando M[2], Jasinge EA[1]
[1]Department of Chemical Pathology, Lady Ridgeway Hospital for Children, Colombo, Sri Lanka
[2]Department of Paediatrics, Colombo North Teaching Hospital, Ragama, Sri Lanka

Introduction

Tyrosinaemia type-I is a rare autosomal recessive metabolic disorder characterized by lack of enzyme fumarylacetoacetate hydrolase (FAH), leading to abnormal accumulation of tyrosine and its metabolites in the liver, causing severe liver disease. Fanconi syndrome, a functional defect in renal proximal tubule characterized by hypophosphataemic rickets, renal tubular acidosis, glycosuria, and aminoaciduria. Etiology is either inherited or acquired. We present a case of hypophosphataemic rickets secondary to tyrosinaemia type-I.

Case presentation

A 2-year-old boy with subtle dysmorphism, born to consanguineous parents, presented with bowing of legs. Parents have experienced three miscarriages and 2 neonatal deaths with healthy male child. Diagnosis of phosphate losing rickets was made and managed accordingly. At the age of nine years, icterus was noted and liver enzymes were elevated. Phosphaturia, glycosuria and calciuria was confirmed by 24 hour urinary excretion studies and Fanconi syndrome was diagnosed. His ammonia level was high. CT abdomen revealed hepatomegaly with parenchymal liver disease, thrombosis of portal vein, splenic vein, and splenomegaly. Plasma amino acid profile revealed elevated tyrosine; 316 µmol/L (22-115) and urine organic acid profile revealed elevated 4-hydroxyphenyl lactate, 4-hydroxyphenyl pyruvate and succinylacetone. Above findings confirmed the diagnosis of autosomal recessive tyrosinaemia type 1 which was genetically supported later. Despite aggressive treatment, the patient expired due to liver failure.

Discussion and conclusions

In tyrosinaemia, treatment with nitisinone and a low-tyrosine diet has improved the prognosis drastically. Thus, early diagnosis is important to improve patient outcomes and reduce complications. Though this patient was diagnosed with phosphate losing rickets at the age of 2 years further evaluation was not carried out to find the etiology. This case indicates the importance of excluding rare inherited diseases in pediatric patients who present with hypophosphataemic rickets. It also highlights the importance of plasma amino acid analysis and urine organic acid analysis in ruling out rare inherited diseases.

Keywords

Tyrosinaemia, hypophosphataemic rickets, Succinylacetone

CR 22

Bilateral Pheochromocytoma in a 29 Year Old Woman Presenting with Hypertension

Pathirana RPMMR, Herath TPK
Department of Biochemistry, Medical Research Institute of Sri Lanka

Introduction

Pheochromocytoma is a rare neuroendocrine tumor that originates from the adrenal medulla or extra-adrenal paraganglion chromaffin tissue which secretes catecholamines. The typical triad of presenting symptoms include episodic headache, palpitations, and sweating. This often misleads clinicians to make a wrong diagnosis. Hypertension is one of the most common manifestations of pheochromocytoma and can be persistent or paroxysmal. Most cases are sporadic, with only 16 % are having a history of associated endocrine disorder such as Multiple Endocrine Neoplasia type II (MEN IIA and IIB), Neurofibromatosis 1 (NF 1) and von Hippel Lindau disease (VHL).

Case presentation

A 29-year-old lady, mother of two children, presented with a history of hypertension for 1 year duration. She presented with paroxysmal episodes of palpitation, excessive sweating, giddiness and flushing for 6 months duration. Her clinical examination was unremarkable except for blood pressure of 140/90 mmHg on several occasions. She had 24-hour urine total metanephrine of 12.17 mg/24h (<1.3) and chromogranin A level of 1045 µg/L (<100). A low 9 am cortisol with inappropriately low short Synacthan test result revealed secondary adrenal insufficiency. Aldosterone and renin levels were normal. Ultrasound scan of abdomen showed bilateral supra-renal masses which were suggestive of Pheochromocytoma. Contrast-enhanced computed tomography demonstrated bilateral adrenal masses. The patient successfully underwent bilateral adrenalectomy. Histopathology confirmed the bilateral adrenal pheochromocytoma without capsular and vascular invasion. Immunohistochemistry confirmed that chromogranin A and synaptophysin were positive. Postoperative recovery was uneventful, and the patient was discharged on 8th post-operative day. Blood pressure returned to normal.

Discussion and conclusions

Pheochromocytoma is a rare cause of hypertension. If the diagnosis of pheochromocytoma is overlooked, the consequences could be disastrous, even fatal. However, if a pheochromocytoma is identified, it is potentially curable, as being one of the causes of surgically correctable hypertension. It is important to exclude associated genetic syndrome.

Keywords

Pheochromocytoma, hypertension

CR 23

Persistent Hyperamylasaemia: A Rare Case of Macroamylasaemia

Wijayasuriya WAM[1], Sujeeva N[1], Peiris R[2], Katulanda G[1]
[1]Department of Chemical Pathology, National Hospital of Sri Lanka
[2]Department of Gastroenterology and Hepatology, National Hospital of Sri Lanka

Introduction

Hyperamylasaemia is seen commonly in salivary, pancreatic and other abdominal disorders. Macroamylasaemia is a rare cause of persistently elevated amylase that subjects the patient to unnecessary investigations if diagnosis is missed.

Amylase, usually cleared by kidneys, forms complexes with globulins mainly IgA and IgG to form macro-amylase which cannot be cleared renally, giving rise to biochemical hyperamylasaemia. Macroamylasaemia causes a diagnostic confusion, when those affected present with non-specific abdominal pain which may be attributed to be of pancreatic origin.

Case presentation

A 60-year-old man presented with epigastric pain, had a serum amylase level of 663 U/L (40-140 U/L). He was managed as acute pancreatitis, but his serum amylase persisted around 650 to 848 U/L. His transaminases, alkaline phosphatase, bilirubin, and creatinine remained within the reference limits throughout the presentation. Imaging with ultrasound scan and CECT of abdomen was unremarkable. Upper gastrointestinal endoscopy revealed a hiatus hernia with mild antral gastritis. His CA 19-9 and CEA were normal. After 2 months from initial presentation, he was found to have a urine amylase of 10 U/L and amylase clearance ratio of 0.4%. Then macroamylasaemia was suspected. Precipitation with polyethylene glycol (PEG) 6000 was carried out and recovered amylase in the supernatant was 10 U/L with a recovery of 12%, confirming macroamylasaemia.

Discussion and conclusions

Hyperamylasaemia can be due to various causes when a patient presents with abdominal pain. Main causes are acute pancreatitis, perforated duodenal ulcer and biliary obstruction. Macroamylasaemia should be suspected when amylase is persistently elevated and stabilized. Urinary amylase clearance ratio of <1% and normal serum lipase support the diagnosis. Macroamylasaemia can be confirmed by PEG precipitation, which can be done in low resource settings. Electrophoresis would be a more appropriate test, but not available in our setting.

Keywords

Macroamylasaemia, PEG precipitation

CR 24

Pseudoparaprotein Band in Serum Protein Electrophoresis (SPE) of a Hemodialysis Patient

Sandaruwani WADS, Pathirana RPMMR, Herath T
Department of Chemical Pathology, Medical Research Institute, Sri Lanka

Introduction

SPE is routinely used in clinical practice as an inexpensive screening test in a patient with signs suggestive of plasma cell disorder. The most diagnostic pattern of SPE is a narrow peak, which is in the gamma, beta or alpha-2 region and is usually found in multiple myeloma. One of the situations where SPE may yield a false positive result is presence of a fibrinogen band. I present a patient in the hemodialysis unit, in whom SPE revealed a narrow peak suggestive of a monoclonal protein, which later turned out to be a fibrinogen band.

Case presentation

A 38-year-old man with end stage renal failure where etiology is unknown, SPE was done by agarose gel electrophoresis followed by densitometric scanning during the diagnostic work up. It revealed a localized narrow peak at beta-gamma interface that is consistent with monoclonal protein. However, immunofixation did not identify any monoclonal protein. At the time of sample collection, the patient has been on regular hemodialysis via a permanent venous catheter. Heparin is used for systemic anticoagulation during hemodialysis. Migration pattern of fibrinogen on the electrophoresis gel can be seen at beta-gamma interface and indistinguishable from monoclonal protein. The sample was treated with thrombin. It induced formation of clot in the sample.

Discussion and conclusions

The presence of fibrinogen in serum can mimic a monoclonal protein on SPE. It may occur in patients with coagulation disorders, heparin therapy or liver failure. Samples with abnormalities with this migration pattern should be treated with thrombin and assessed for clot formation to test the presence of fibrinogen. We should bear in mind the possibility of fibrinogen, especially in patients undergoing hemodialysis where heparin is used for systemic anticoagulation. This knowledge may save many unnecessary diagnostic procedures and result in significant cost saving.

Keywords

Serum protein electrophoresis, fibrinogen, heamodialysis

CR 25

A 12-Year-Old Boy Presenting with Acute–on-Chronic Liver Failure (ACLF)

Sandaruwani WADS, Herath T
Department of Chemical Pathology, Medical Research Institute, Sri Lanka

Introduction

Wilson disease is a rare inborn error of copper metabolism caused by defective copper binding ATPase protein encoded by a gene (ATP7B) on chromosome 13. Defective excretion causes excessive copper primarily accumulates in the liver and other organs.

Case presentation

A 12-year-old previously healthy boy was admitted after one week of generalized body weakness, yellowish discoloration of eyes and ankle swelling. On examination, he was jaundiced and firm liver was palpated 3 cm below the costal margin. Initial investigations showed aspartate transaminase (AST) 311 U/L (0-40), alanine transaminase (ALT) 562 U/L (0-40), total bilirubin 32 µmol/L (3-20) and direct bilirubin 11 µmol/L. (0-3) The prothrombin time was 29.7 seconds (10-13), international normalized ratio (INR) 2.36 (1.1). Ultrasound scan of abdomen revealed chronic liver parenchymal disease. The boy was diagnosed with ACLF. Upon further investigations, Kayser-Fleischer (KF) rings were visualized on slit lamp examination. Ceruloplasmin level was 0.13 g/L (0.1-0.2). Measured serum total copper was 11.13 µmol/L (11-24.4) and calculated free copper was 297.25 µg/L. (<150 µg/L) The Penicillamine challenged 24-hour urine copper excretion was 1027.12 µg/24 hours (15-70).

Discussion and conclusions

Wilson disease may present with either acute or chronic liver failure. In older individuals, the presentation may be neurologic or psychiatric because of deposition of copper in the brain. KF rings appear due to the deposition of copper in the cornea. Combination of abnormally low concentration of ceruloplasmin and increased plasma free copper is suggestive of Wilson disease. Patients typically have decreased ceruloplasmin, although the concentration may be within the reference interval since it is a positive acute phase reactant. The increased plasma free copper causes high amounts of copper to be excreted in the urine. Excess urine free copper forms a useful screening test for Wilson disease since most copper excreted in the bile in health. A liver biopsy is usually required to make a definitive diagnosis.

Keywords

Wilson disease, Penicillamine challenged 24-hour urine copper excretion

CR 26

GI Amyloidosis: A Rare Presentation of AL Amyloidosis

De Silva DDS, Hemarathne MHSL, Gunasekara RASR, Gallage BMP, Samarsinghe R
Department of Chemical Pathology, National Cancer Institute, Maharagama, Sri Lanka

Introduction

Amyloidoses are a group of disorders due to extracellular deposition of insoluble proteins with abnormal configuration. In light chain amyloisosis (AL), amyloid proteins are monoclonal free lambda or kappa light chains. They can be deposited in any organ of the body and symptoms depend on the organ affected. AL amyloidosis with biopsy proven gastrointestinal system involvement is rare.

Case presentation

A 52-year-old patient presented with altered bowel habits and dysphagia. Upper gastrointestinal endoscopy reveals a duodenal polyp and lower gastrointestinal endoscopy reveals yellowish deposits in sigmoid and rectal mucosa. Histology of both biopsies was compatible with amyloidosis and confirmed by Congo red. Bone marrow biopsy has no evidence of lymphocytic infiltration or multiple myeloma. Serum protein electrophoresis and serum immunofixation was normal but in serum free light chain kappa was elevated as 168 mg/L and lamda was 22.97 mg/L and ratio was increased as 7.3. She had concentric left ventricular hypertrophy with elevated brain natriuretic peptide (BNP). She also had proteinuria and ultrasound reveals no organomegaly.

Discussion and conclusions

She was diagnosed with AL amyloidosis and treated with chemotherapy. Post-treatment follow-up shows dramatic reduction in BNP levels, proteinuria and serum free light chain ratio.

Keywords

AL Amyloidosis, gastro intestinal amyloidosis, serum free light chain

CR 27

Malignant Hypertension Biochemically Mimics Renal Artery Stenosis

Kiyamudeen F, Rajapaksha RDDM, Jayawardhana RDP
Department of Chemical Pathology, National Hospital Kandy

Introduction

Malignant hypertension (MH) is regarded as the severe form of hypertension with an incidence of 1-2 cases per 100,000/year. MH is characterized by elevated blood pressure with multi-organ ischemic changes, especially retinal damage. Aetiology of MH can be essential or secondary. Regardless of the aetiology, it is associated with hyperreninaemic-hyperaldosteronism which biochemically mimics secondary causes like renovascular hypertension or renin-secreting neoplasm.

Case presentation

Case 1

A 49-year-old female, defaulted treatment for hypertension presented with dysnoea, chest pain, headache and blurred vision for one week. On admission, blood pressure was 300/150 mmHg with tachycardia while other vital signs and physical examination were unremarkable except fundoscopy which revealed bilateral retinal exudates. Initial investigations revealed thrombocytopaenia, hypokalaemia, metabolic alkalosis and proteinuria with normal creatinine. ECG showed signs of left ventricular hypertrophy. Plasma aldosterone and plasma direct renin concentration were 47.8 ng/dL (7-30) and 132.3 mIU/L (4.2-45.6) respectively.

Case 2

A 42-year-old, previously unevaluated male presented with headache and blurred vision for four days. On admission, blood pressure was 270/150 mmHg. However, other vital signs were normal and physical examination was unremarkable except fundoscopy which revealed bilateral papilledema. Further, he had low normal serum potassium and proteinuria with elevated creatinine. ECG showed signs of left ventricular hypertrophy. Plasma aldosterone and direct renin concentration were 70 ng/dL (7-30) and 190.6 mIU/L (4.2-45.6) respectively.

In both patients, renal artery duplex excluded renal artery stenosis and radiological examination of abdomen and pelvis revealed no supra-renal masses.

Discussion and conclusions

MH mimics renovascular hypertension biochemically as both are associated with hypokalaemia, metabolic alkalosis and hyperreninaemic-hyperaldosteronism. Both of these cases were considered as malignant hypertension which is essential in origin following the exclusion of secondary causes. MH should be included as one of the differentials in the interpretative commenting of a report with high renin with high aldosterone levels.

Keywords

Malignant hypertension, hyperreninaemic hyperaldosteronism, papilledema

CR 28

Two Children with Familial Chylomicronaemia Syndrome

Kiyamudeen F[1], Rajapaksha RDDM[1], Atapattu N[2], Hooper AJ[3], Burnett JR[3], Jasinge E[2]
[1]Department of Chemical Pathology, National Hospital Kandy
[2]Lady Ridgeway Hospital for Children, Colombo
[3]Royal Perth Hospital and Fiona Stanley Hospital Network, Perth, Western Australia, Australia

Introduction

Familial Chylomicronaemia syndrome (FCS) is a rare autosomal-recessive, monogenic disorder of lipid metabolism following mass or functional deficiency of lipoprotein-lipase (LPL). Because of non-specific symptomatology, diagnosis is usually delayed. Lipemic serum and hypertriglyceridemia are evident due to the accumulation of chylomicrons. Genetic mutational studies divide FCS into LPL-FCS (80-90%) and non-LPL-FCS (10-20%). LPL-FCS is usually associated with a very high triglyceride level compared to non-LPL-FCS.

Case presentation

Case 1

A 7-year-old girl, product of non-consanguinity presented with recurrent abdominal pain for one year. Examination revealed hepatosplenomegaly with no evidence of lipemia-retinalis and xanthomas. Grossly lipemic fasting serum showed triglyceride 14.3 mmol/L (0.4-1.8), total cholesterol 9.3 mmol/L (3.6-5.7) and HDL-C 0.58 mmol/L (>1.04). Mutational studies revealed a homozygous likely pathogenic variant in the LPL gene.

Case 2

A 9-year-old boy, product of second-degree consanguinity, re-evaluated for dyslipidemia which was initially diagnosed at 40 days old and defaulted follow-up. He had few xanthoma on the trunk but no evidence of lipemia-retinalis which had been present earlier. Fasting lipemic serum depicted triglyceride 9.9 mmol/L (0.4-1.8), total cholesterol 4.5 mmol/L (3.6-5.7) and HDL-C 0.38 mmol/L (>1.04). Mutational studies revealed homozygous likely pathogenic variant in the GPIHDBP1 gene.

In both cases, overnight "Refrigerator standing test" showed creamy supernatant with clear infranatant suggested presence of chylomicrons. Lipid profiles of all family members were normal.

Discussion and conclusions

Clinical features like hepatosplenomegaly, xanthomas and lipemia-retinalis warrant further evaluation given confirming FCS. In both these cases, the fasting serum samples were grossly lipemic which should not be overlooked. The initial biochemical profile should include triglyceride and total cholesterol. An overnight refrigerator test, although crude gives a clue about the presence of chylomicrons. The primary treatment modality is nutritional therapy with fat restriction regardless of the etiology. However, genetic mutational study prevents misclassifying non-LPL-FCS as LPL-FCS which is commoner among both.

Keywords

Familial chylomicronaemia syndrome, lipemia, lipoprotein lipemia

CR 29

Familial Hypercholesterolaemia in a Child of Sri Lankan Family

Rathnayake A[1], Ratnapala U[2], Samarasekera T[3], Abeynayake GPN[1]
[1]Department of Biochemistry, Provincial General Hospital, Badulla
[2]Nephorology Unit, Provincial General Hospital, Badulla
[3]Endocrinology Unit, Provincial General Hospital, Badulla

Introduction

Familial hypercholesterolaemia (FH) is a common inherited metabolic disease with an autosomal dominant inheritance. It is characterized by elevated LDL cholesterol causing premature coronary heart disease. To the best of our knowledge, this is the first report of a child with heterozygous FH (HeFH) resulting from c.1784G>A (p.Arg595Gln) mutation in LDLR gene in Sri Lanka.

Case presentation

A 12-year-old male child with a BMI of 25 kg/m2, presented to the nephrology clinic with a complaint of frothy urine. His baseline lipid profiles revealed severe hypercholesterolaemia, (TC = 9.2 mmol/L, LDL-C = 7.4 mmol/L) and fasting plasma glucose, TSH, liver function, serum creatinine, HbA1c, urine analysis and urine protein to creatinine ratio were normal. No lipid stigmata noted. There was a family history of mother being diagnosed with angina and hypercholesterolemia at 30 yrs. She also had xanthelasma. Maternal grandfather had dyslipidaemia and recurrent episodes of myocardial infarction and died at 57 yrs. According to the Simon Broome criteria, the child was classified as having possible FH. A genetic analysis confirmed the presence of c.1784G>A (p.Arg595Gln) heterozygous missense mutation in LDLR gene. Even though his sister aged 16 had hypercholesterolaemia (TC = 6.3 mmol/L, LDL-C = 4.7 mmol/L), cascade screening could not be performed. Lipid lowering therapy was initiated with dietary and lifestyle modifications and a statin. On follow-up visit statin was increased resulting in a favorable reduction of LDL-C. At 1-year post diagnosis the patient continued to do well.

Discussion and conclusions

HeFH affects 1 in 200 to 300 people yet continues to be underdiagnosed with < 1% of cases diagnosed in many counties as genetic testing is not universally available and is costly. Genetic testing increases the compliance of life long preventive therapy. Establishment of a national patient registry is recommended to address the gap in research and track outcomes over time.

Keywords

Familial hypercholesterolaemia, LDLR gene

CR 30

Monoclonal Cryoglobulinaemia: Diagnosed by Cryoprecipitate Immunofixation

Wijayasuriya WAM, Sujeeva N, Dissanayake DJGGN, Katulanda G
Department of Chemical Pathology, National Hospital of Sri Lanka

Introduction

Cryoglobulinaemia is a rare disease caused by circulating monoclonal or polyclonal immunoglobulins that precipitate at lower temperatures and resolubilize on warming. It presents with a wide variety of clinical conditions such as skin rash, joint pains, polyneuropathy and renal involvement. Type I cryoglobulinaemia is monoclonal associated with B-cell lymph proliferative diseases such as multiple myeloma whereas Type II and III are polyclonal or mixed associated with autoimmune diseases or infections such as hepatitis B or C.

Case presentation

A 42-year-old female presented with recurrent episodes of bilateral lower limb pruritic maculopapular rash associated with sensory polyneuropathy and arthralgia involving large joints over six months duration. She was found to have anemia and thrombocytopaenia. Her ESR was 45 mm/1st hour and LDH 655 U/L. Skin biopsy of the skin lesions revealed a leucocytoclastic vasculitis. Qualitative test for cryoglobulins was positive on second day of test and immunofixation of the cryoprecipitate revealed an abnormal monoclonal band of IgM kappa chains. Serum protein electrophoresis, urine light chains and serum light chains were normal. She was planned for a bone marrow biopsy and further testing for multiple myeloma.

Discussion and conclusions

This shows how early testing for cryoglobulinaemia in a patient with a vasculitic rash aids in the diagnosis of identifying the disease and guides in further testing towards a probable cause. In this patient, the identification of a monoclonal band prompted investigation in the direction of a B-cell lymph proliferative disorder such as multiple myeloma or Waldestrom macroglobulinaemia. Qualitative testing for cryoglobulinaemia is a simple test that can be done in low resource laboratory settings and the cryoprecipitate immunofixation can identify whether it is monoclonal or polyclonal or mixed disease, narrowing down possible associated disease conditions to investigate for.

Keywords

Type I monoclonal cryoglobulinaemia, cryoprecipitate immunofixation

CR 31

Role of Adrenal Venous Sampling in the diagnosis of Primary Hyperaldosteronism

Prashanthan S, Balasooriya BMCM, Gunawardane SA, Katulanda GW
Department of Chemical Pathology, National Hospital of Sri Lanka

Introduction

Primary hyperaldosteronism is due to excessive production of aldosterone from adrenal cortex, characterized by low renin levels and high blood pressure. The causes are bilateral adrenal hyperplasia, unilateral aldosterone producing adrenal adenoma or adrenal cortical carcinoma. Adrenal venous sampling (AVS) is an invasive radiological procedure combined with biochemical testing, which helps to find the location of excessive aldosterone production. Presence of adrenal incidentaloma makes AVS more valuable as a diagnostic tool. A case series of primary hyperaldosteronism is presented here.

Case presentation

Case 1

A 35-year-old women presented with muscle weakness and resistant hypertension despite treatment with five antihypertensives. She had hypokalaemia (2.3 mmol/L) and high plasma aldosterone renin ratio (365 ng/dL per ng/mL/hr). Her imaging studies were unremarkable. She underwent AVS, which revealed a lesion in left adrenal gland with a lateralization index of 24. She is awaiting surgery.

Case 2

A 34-year-old presented with palpitations and headache for one week. She had been apparently healthy before. On examination she had hypertension. Investigations revealed hypokalaemia (2.5 mmol/L) and high aldosterone renin ratio (118 ng/dL per ng/mL/hr). Imaging showed a lesion in the right adrenal gland. AVS revealed aldosterone producing tumor in the right adrenal gland (Lateralization index was 16.69). She underwent right side adrenalectomy and histology was compatible with an adrenocortical adenoma.

Case 3

A 36-year-old man admitted with chest pain and hypertension. He was found to have hypokalaemia (2.5 mmol/L) and high aldosterone renin ratio (95.7 ng/dL per ng/mL/hr). Saline loading test was consistent with primary hyperaldosteronism. The imaging studies showed normal adrenal glands and AVS did not confirm lateralization of aldosterone secretion. It was more likely for him to have bilateral adrenal hyperplasia causing primary hyperaldosteronism. He was started on spironolactone which immediately brought down the blood pressure.

Discussion and conclusions

Adrenal venous sampling is the gold standard in the lateralization of aldosterone excess and differentiation of unilateral adrenal adenoma from bilateral adrenal hyperplasia.

Keywords

Primary hyperaldosteronism, adrenal venous sampling, lateralization index

CR 32

Adrenal Venous Sampling, Importance of Contralateral Suppression Index in Lateralization of Primary Hyperaldosteronism

Rajapaksha RDDM[1], Kiyamudeen F[1], Rathnayaka RMD[2], Antonypyillai CN[2], Gunathilaka S[2], Jayawardana RDP[1]
[1]Department of Chemical Pathology, National Hospital Kandy, Sri Lanka
[2]Department of Endocrinology, National Hospital Kandy, Sri Lanka

Introduction

Adrenal venous sampling (AVS) is a gold standard test for lateralization of primary hyperaldosteronism (PA) with 95% sensitivity and 100% specificity as adrenal computed tomography (CT) has several limitation. Unilateral etiologies are surgically curable whereas bilateral causes are often managed medically with mineralocorticoid receptor blockers. Common causes of PA include, unilateral aldosterone producing adenomas (APA) and bilateral idiopathic adrenal hyperplasia (IAH).

Case presentation

A 52-year-old female with hypertension complained left sided chest pain for 6 hours. On examination blood pressure was 180/ 100 mmHg and ECG showed hypokalemic changes despite being on treatment with Losartan. A laboratory evaluation revealed normal sodium, refractory hypokalaemia with high urine potassium excretion and metabolic alkalosis. PA was confirmed with elevated aldosterone 138 ng/dL (>20) with suppressed renin activity of 0.0146 ng/mL/hr (<1). CT demonstrated bilateral adrenal adenoma. Crucial diagnostic dilemma has arisen whether it is bilateral APA or unilateral APA with contralateral nonfunctional tumor. Unstimulated AVS was performed. Aldosterone and cortisol concentration were measured in the samples obtained from right and left adrenal vein, and femoral vein. Sensitivity index (SI) calculated from adrenal vein to peripheral cortisol ratio in each side. SI of left and right is 1.38 and 3.02 respectively which confirmed failed right side cannulation. Therefore, lateralization index (LI) could not be calculated. However, contralateral suppression index (CSI) was calculated from aldosterone to cortisol ratio from left adrenal to femoral. CSI of 0.16 (<1) indicated suppressed left side and possible APA in right side. Right adrenalectomy was performed. Following surgery aldosterone level became normal.

Discussion and conclusions

Since AVS is technically demanding and operator depending procedure bilateral successful cannulation is not always possible with anatomical variation and small caliber in right adrenal vein. Therefore, calculation of CSI is useful in interpreting the results of unilateral cannulation.

Keywords

Adrenal venous sampling, contralateral suppression index, sensitivity index

CR 33

A Rare Case of Pseudomyxoma Peritonei (PMP) with Elevated Circulating Tumor Markers

Amarasekara MHK , Gunasekara RASR, Samarasinghe R
Department of Chemical Pathology, Apeksha Hospital, Maharagama

Introduction

PMP is a rare malignant condition due to progressive accumulation of mucinous tumour cells in the peritoneal cavity, mostly following perforation of an appendicular tumour. PMP is diagnosed by supportive imaging and cytological findings. Circulating tumour markers (CTM) help to locate the primary pathology, predict the prognosis, select the mode of treatment and to determine the surgical success in PMP. Reduced CA19.9 levels following cytoreductive surgery indicate the completeness of tumour removal. Normal CA19.9, CEA and CA125 in a patient with PMP indicate a good prognosis.

Case presentation

An 80-year-old man, presented with a 6 month history of increasing abdominal girth and loss of appetite. On examination, he had mild pallor and gross ascites.

On investigation, diagnostic paracentesis was negative for acid fast bacilli. Peritoneal fluid cytology revealed scattered mesothelial cells and atypical mucinous cells suspicious of malignancy. Computerized tomography (CT) scan of the abdomen revealed, multilocular peritoneal collections extensively scalloping the liver margins with thickened omentum and a central mass lesion continuous with the peritoneum suspicious of a bowel pathology. However lower gastro intestinal endoscopy was normal.
CTM revealed markedly elevated CA19.9 (853 U/mL), moderately elevated carcinoembryonic antigen (CEA-25.1 ng/mL) and normal prostate specific antigen (PSA).

Since the patient was not fit for cytoreductive surgery, systemic chemotherapy was planned. However patient expired before starting treatment.

Discussion and conclusions

Mucinous cells in peritoneal fluid and the pathognomonic findings in the CT scan of the abdomen suggests the diagnosis of PMP. However exact origin of the pathology was not identified.

Baseline elevated CA19.9 in this patient, indicates worse progression free survival. Both elevated CEA and CA19.9 indicate an elevated risk for recurrent disease despite aggressive therapy. Elevated multiple tumour markers including markedly high CA19.9 and the advanced age make this patient not suitable for cytoreductive surgery.

Keywords

Pseudomyxoma peritonei, CA19.9, carcino embryonic antigen

CR 34

A Triclonal Gammopathy in a Patient with Multiple Myeloma

Jayasekara LMDT , Dayanath BKTP
Department of Chemical Pathology, Colombo North Teaching Hospital, Ragama

Introduction

Multiple myeloma is a plasma cell malignancy involving bone marrow, producing monoclonal immunoglobulins or light chains. Though monoclonal disease is the commonest phenotype, biclonal and triclonal disease are seldom reported.

Case presentation

A 76-year-old female patient presented with lower back pain and anorexia for three weeks with pallor and moderate hepatosplenomegaly, without lymphadenopathy and was found to have severe anaemia and marked rouleaux formation in blood picture with a high ESR (151 mm/1st hour) and stage III chronic kidney disease. Serum protein capillary electrophoresis revealed two monoclonal bands in the beta region (concentrations 29.2, 4.6 g/L) and another in the gamma region (1.3 g/L). Immunosubtraction detected the bands to be biclonal IgA lambda and monoclonal light chain lambda in sequence. But serum gel electrophoresis detected only the first two clones at concentrations of 28.2 and 3.6 g/L in the beta region and serum immunofixation detected triclonal disease with biclonal IgA lambda and another monoclonal lambda light chain band. Her serum kappa to lambda free light chain ratio was >100. Her urine electrophoresis showed excretion of free lambda light chains. Her bone marrow trephine biopsy finding was consistent with the diagnosis of multiple myeloma with no evidence of amyloid deposition. Her diagnosis was concluded as multiple myeloma with triclonal gammopathy. She had high serum beta 2 microglobulin level (11.17 mg/L) with low serum albumin (3.11 g/dL) indicating ISS stage III disease. Her skeletal survey revealed osteopenia with multiple degenerative changes and a T12 wedge fracture.

Discussion and conclusions

Triclonal gammopathy could be a result of unrelated M protein production from three different plasma cell clones or 3 types of M protein production by a single plasma cell clone. It is a rare entity which needs more evidence related to number of clonality on response to treatment and prognosis.

Keywords

Multiple Myeloma, triclonal gammopathy

CR 35

Use of Drain Fluid Amylase to Predict the Occurrence and Severity of Pancreatic Fistula

Thusyanthy P, Liyanagunawardana JE, Athapaththu AMTU, Samarasinghe NMMK, Hewa SP
Department of Chemical Pathology, Colombo South Teaching Hospital, Kalubowila, Sri Lanka

Introduction

Pancreatic fistula (PF) is the most feared complication following pancreatic surgery which lead to increase morbidity and mortality. According to International Study Group on Pancreatic Fistula (ISGPF), PF is defined as a level of amylase in the abdominal drain greater than three times the serum value on day 3 or more following operation. Recently, many studies show high interests in drain amylase concentration on post-operative day 1 (DPA1) for the prediction of post-operative PF.

Case presentation

A-69-year-old male known patient with neuroendocrine tumour underwent distal gastrectomy on March 2021. He presented with abdominal pain and found to have multiple intra-abdominal abscess by ultrasound scan. Laparotomy was performed on 14th May 2022 which revealed an abscess cavity between head of pancreas and transverse colon. Two drains were inserted, one was in the abscess cavity and other one was in the peritoneal cavity. Day1 drain fluid amylase from abscess cavity and peritoneal cavity were 262582 U/L, 157346 U/L respectively. Day 5 drain fluid amylase from abscess cavity and peritoneal cavity were 17394 U/L, 30100 U/L respectively with serum amylase of 186 U/L. Pancreatic fistula was diagnosed from day 1 amylase results and day 5 amylase level indicated resolution of fistula. We planned to monitor with regular drain fluid amylase until full recovery.

Discussion and conclusions

Early drain fluid amylase measurement (DPA1) is emerged as an early tool to predict the occurrence and severity of pancreatic fistula. Measurement of drain fluid amylase in this patient is useful for early diagnosis, appropriate management and monitoring and prevent further complication. Although DPA1 has been implied with superb specificity and sensitivity for overall POPF, there is still controversy in inconsistent opinions.

Keywords

Pancreatic fistula, drain fluid amylase

CR 36

A Patient with Symptomatic Primary Hyperparathyroidism

Thusyanthy P, Liyanagunawardana JE, Athapaththu AMTU, Samarasinghe NMMK, Hewa SP
Department of Chemical Pathology, Colombo South Teaching Hospital, Kalubowila, Sri Lanka

Introduction

Primary hyperparathyroidism (PHPT) is the common cause for hypercalcaemia in hospitalized patients.

Case presentation

A 55-year-old lady presented with generalized body aches, weakness and bone pains for 6 months duration. Her initial investigations revealed elevated serum corrected calcium (3.2 mmol/L), reduced serum phosphate (0.77 mmol/L) with elevated intact parathyroid hormone [iPTH (78.9 pmol/L) (1.7-6.7)] and elevated alkaline phosphatase (3.25 µkat/L) with normal 25(OH) vitamin D level (87.5 nmol/L) suggestive of PHPT. Ultrasound scan (USS) neck, contrast enhanced computed tomography (CECT) neck and Tc99m Sestamibi parathyroid scan suggested a parathyroid adenoma in the right inferior parathyroid gland. Dual energy X-ray absorptiometry (DEXA) scan revealed no significant osteoporosis. She underwent right inferior parathyroidectomy, her intra-operative parathyroid hormone became 26.4 pmol/L which indicated successful removal of tumour. Histology confirmed the parathyroid adenoma. She became biochemically normal after surgery.

Discussion and conclusions

The diagnosis of hyperparathyroidism should be made with elevated albumin corrected total calcium or ionized calcium level, hypophosphatemia and elevated serum PTH level in the absence of other causes of hypercalcaemia. Early diagnosis and treatment will prevent further complications. Parathyroidectomy is the primary treatment modality in PHPT and is recommended in symptomatic patients. Intraoperative parathyroid hormone monitoring (IPM) is useful to ensure successful operation. Ideally, we have to take samples before 15 minutes of starting surgery and 20 minutes after excision of hyper secreting gland then calculate the percentage of reduction if it is > 50% it will confirm successful excision. Time specific sample collection, immediate transport and immediate analysis are important practical problems in IPM.

Keywords

Symptomatic hyperparathyroidism, intra operative PTH monitoring

CR 37

Diagnostic Dilemma in a Newborn with High Procalcitonin and Multisystemic Involvement

Thusyanthy P, Liyanagunawardana JE, Athapaththu AMTU, Samarasinghe NMMK, Hewa SP
Department of Chemical Pathology, Colombo South Teaching Hospital,
Kalubowila, Sri Lanka

Introduction

Heart failure (HF) represents an important cause of morbidity and mortality in childhood. HF in children differs from adults in many aspects including etiology, clinical presentations and management.

Case presentation

A 4-day-old term baby girl of non-consanguineous parents, presented with a history of less activity and poor sucking. On further evaluation, the child had respiratory distress, low urine output, body swelling, fever and convulsion. Her basic investigations revealed neutrophilia in full blood count, ALT-423 U/L, AST-1151 U/L, albumin-20 g/L, total bilirubin-172 µmol/L, INR-2.14, blood urea-14.5 mmol/L, serum creatinine-142 µmol/L, serum sodium-127 mmol/L, procalcitonin-13.2 ng/mL, high sensitive troponin I-1.48 ng/mL, positive SARS- cov-2 total antibody (Index > 45), sterile blood culture and serum ferritin-5712 ng/mL with normal CRP and ESR. Tentative diagnosis of multisystem inflammatory syndrome in children (MIS-C) was made in the presence of multiorgan involvement with positive SARS- cov-2 antibody index even though CRP and ESR were persistently normal. However, there was poor response to treatment. In the presence of altered liver functions, hepatomegaly and ascites together with 2D echo findings of large patent ductus arteriosus, moderate pulmonary stenosis and mild pulmonary hypertension confirmed the diagnosis of heart failure. Baby was treated with IV frusemide and underwent PDA ligation. Two days after surgery, the baby passed away due to sepsis.

Discussion and conclusions

In the clinical setting, an accurate diagnosis and defining etiology is essential to optimal treatment of heart failure in children. Even though acute heart failure can occur as a complication in patients with MIS-C, it is unlikely in the presence of elevated procalcitonin with normal CRP and ESR. Positive SARS- cov-2 antibody in a newborn can be due to maternal vaccination for SARS-cov-2.

Keywords

Heart failure, MIS-C, procalcitonin

CR 38

Gitelman Syndrome with Acute Lower Limb Weakness

Samarasinghe NMMK, Thusyanthy P, Liyanagunawardana JE, Athapaththu AMTU, Hewa SP
Department of Chemical Pathology, Colombo South Teaching Hospital, Kalubowila, Sri Lanka

Introduction

Gitelman syndrome is a rare, autosomal recessively inherited renal tubulopathy. It causes imbalances of body ions, such as potassium, magnesium and calcium.

Case presentation

A previously healthy 38-year-old female was presented with sudden onset bilateral lower limb weakness with similar two past episodes. She had moderately reduced power of the lower limbs. The sensory perception, reflexes, upper limbs, respiration and swallowing were intact. Her blood pressure was normal. Investigations revealed serum potassium 2.5 mmol/L (3.5-5.1), serum magnesium 0.83 mmol/L (0.85-1.1), serum chloride 90 mmol/L (96-105). 24 hour urinary potassium excretion was 130 mmol/L (25-125). 24 hour urine calcium excretion; 93 mg/24hour (100-300). Serum sodium, corrected calcium and phosphate were normal. She had metabolic alkalosis [pH 7.48 (7.35-7.45), pCO2 40 mmHg (35-45), pO2 95 mmHg (75-100), HCO3 31.1 mmol/L (23-28)]. Plasma Renin activity was 6.3 ng/mL/hr (0.6 – 4.18), aldosterone was 74 ng/dL (5.4-34) and the ratio was 11.7 (<30). Gitelman syndrome was tentatively diagnosed. Genetic testing revealed a positive pA523T mutation of the SLC12A3 gene and Gitelman syndrome was diagnosed.

Discussion and conclusions

The basic investigations of the patient revealed that the cause of her limb weakness is hypokalaemia. Simultaneous serum and urine studies could reveal the electrolyte losing path where as to kaliuresis, and co-existing hypomagnesaemia, hypocalciuria and hypochloraemic metabolic alkalosis, raised the possibility of the Gitelman syndrome. Despite hypocalciuria, most of the cases of Gitelman syndrome, show normal serum calcium. Thus the biochemical investigations could play a major role in the initial diagnosis of Gitelman syndrome. However, genetic studies are essential for the confirmation of diagnosis.

Keywords

Gitelman syndrome, hypokalaemia, hypocalciuria, SLC12A3 gene

CR 39

A Middle-Aged Female Presenting with Features of Cholestasis – A Case Report of Primary Biliary Cirrhosis

Athapaththu AMTU, Samarasinghe NMMK, Thusyanthy P, Liyanagunawardana JE, Hewa SP
Department of Chemical Pathology, Colombo South Teaching Hospital, Kalubowila, Sri Lanka

Introduction

Primary biliary cirrhosis (PBC) is a slowly progressive, autoimmune, cholestatic liver disease which should be differentiated from other causes of cholestasis by characteristic circulating anti-mitochondrial antibodies and histological findings along with biochemical features.

Case presentation

A 52-year-old previously healthy female presented with severe loss of appetite with vomiting and abdominal pain associated with pruritus, fatigue and loss of weight for 2 months duration. On examination she was pale, icteric and had generalized hyperpigmentation and scratch marks with tender hepatomegaly. Biochemical investigations revealed ALP-537.6 U/L (98-258), GGT-173.5 U/L (9-64), ALT-1074 U/L (0.1-40), AST-1620 U/L (0.1-40), albumin-30 g/L (35-50), total protein-77 g/L (60-83), globulins-47 g/L (25-33), total bilirubin-367 µmol/L(5-21), direct bilirubin-201 µmol/L (0-3.4) , indirect bilirubin-166 µmol/L and ESR-52 mm/1st hour. Hepatitis screening and SAT were negative. Abdominal USS revealed hepatomegaly with ascites and neither extra hepatic biliary obstruction nor space-occupied lesions. Probable causes for extra hepatic and intrahepatic cholestasis were excluded clinically, radiologically and biochemically. Immunological investigations revealed ANA (1:1000), positive anti-mitochondrial antibody and IgM level was 185 mg/dL (47-147). Liver biopsy confirmed the diagnosis of PBC and she was treated symptomatically with ursodeoxycholic acid, vitamin K, spironolactone etc. However, she ended up with severe hepatic dysfunction and expired one year after diagnosing PBC.

Discussion and conclusions

PBC is associated with improved outcomes with early diagnosis and treatment with ursodeoxycholic acid. Thus, it should be suspected in middle aged females with an elevated ALP without extra hepatic biliary obstruction. Follow up aims to detect complications like cirrhosis, hepatocellular carcinoma and metabolic bone disease. However, prognosis of PBC depends on the symptoms, elevated ALP and bilirubin levels, advanced histologic stage, presence of ANA and certain genetic polymorphisms.

Keywords

Cholestatic liver disease, primary biliary cirrhosis, anti-mitochondrial antibodies

CR 40

A Case Report of Nephrogenic Diabetes Insipidus

Prashanthan S[1], Wijayasuriya WAM[1], Madurangi DWDD[1], Inthujah T[1], Pathmanathan S[2], Katulanda GW[1]
[1]Department of Chemical Pathology, National Hospital of Sri Lanka
[2]Department of Endocrinology, National Hospital of Sri Lanka

Introduction

Nephrogenic diabetes insipidus is a water balance disorder. It is defined as impaired renal tubular response to vasopressin which leads to inability to concentrate urine. It can be acquired or inherited. The acquired causes of nephrogenic diabetes insipidus are chronic kidney disease, hypokalemia, hypercalcaemia, obstruction of urinary tract and medications such as lithium.

Case presentation

A 65-year-old woman on therapy for psychiatric disorder presented with altered behavior for 2 months duration and reduced level of consciousness for 2 days. She had been on lithium carbonate for more than 20 years. She had no history of fever, vomiting, diarrhea or fits. Her laboratory investigations revealed increased serum sodium (169 mmol/L) and osmolality (360 mOsmol/KgH2O) with an inappropriately low urine osmolality (199 mOsmol/KgH2O). Her liver function, renal functions, glucose, calcium, cortisol and thyroid functions were normal. To confirm the diagnosis desmopressin challenge test was done. After desmopressin, serum osmolality, urine osmolality and serum sodium were not changed. Based on the history and biochemical evidence, diagnosis of complete nephrogenic diabetes insipidus was made.

Discussion and conclusions

Most frequent side effect of lithium is nephrogenic diabetic insipidus. Patients who are on chronic lithium therapy can develop resistance to antidiuretic hormone (ADH). Although thiazides can be used as a therapeutic option in nephrogenic diabetic insipidus, should be used with caution in lithium induced cases, because of the potential to increase toxicity. In this case lithium was discontinued and treatment was switched to risperidone and clonazepam. Hydrochlorothiazide and a low sodium diet was started.

Keywords

Nephrogenic diabetic insipidus, antidiuretic hormone, lithium

CR 41

A Diagnostic Dilemma in a Patient with Hyponatremia in the Setting of Cholestatic Liver Disease

Rathnayake A[1], Kodisinghe SK[2], Abeynayake GPN[1]
[1]Department of Chemical Pathology, Provincial General Hospital, Badulla
[2]Gastroenterology Unit, Provincial General Hospital, Badulla

Introduction

We report a case of a 42-year-old lady who developed pseudohyponatraemia due to hypercholesterolemia.

Case presentation

A 42-year-old female with a history of hypertension, type 2 diabetes, CKD and gallstone disease presented with vomiting and pruritus. Physical examination revealed scleral icterus and mild bilateral ankle edema. No xanthelasma, tendon xanthoma or arcus. Biochemistry results showed a cholestatic picture and severe hyponatraemia (114 mmol/L) with normal potassium and markedly elevated serum creatinine and urea. Plasma glucose was 7.2 mmol/L. Given the history of vomiting and severe hyponatraemia she was treated with a 3% saline bolus and electrolytes were repeated. It was not consistent with blood gas (BG) sodium results which revealed a difference of 13 mmol/L indicating pseudohyponatraemia. The rerun sodium with direct ISE was comparable with BG. Clinical team was informed and she was deemed euvolaemic and managed as having moderate hyponatraemia while her losartan was changed to prazosin. Lipid profile revealed markedly elevated total cholesterol (TC) of 32 mmol/L with hypertriglyceridemia (6.8 mmol/L) and direct LDL cholesterol (LDL-C) of 10.5 mmol/L. Viral hepatitis screening was negative and serum ferritin was 550 ng/mL. Serum IgG and ceruloplasmin were normal while antimitochondrial antibody was positive (> 1/40). Imaging did not reveal intra or extra hepatic duct dilatation or any evidence of local and diffuse lesions in the liver. A possible diagnosis of primary biliary cholangitis with advanced liver disease was made and was treated with urodeoxycholic acid, frusemide, lactulose syrup and antibiotics. Her LDL-C was not comparable with TC which was thought to be due to lipoprotein X (LpX) resulting pseudohyponatraemia.

Discussion and conclusions

This highlights the need of serum sodium measurement with direct ISE in the context of hyponatraemia and cholestatic liver disease before initiating treatment of hyponatraemia and being aware of LpX in cholestatic liver disease.

Keywords

Lipoprotein X, Cholestatic liver disease, Primary biliary cholangitis, Pseudohyponatraemia

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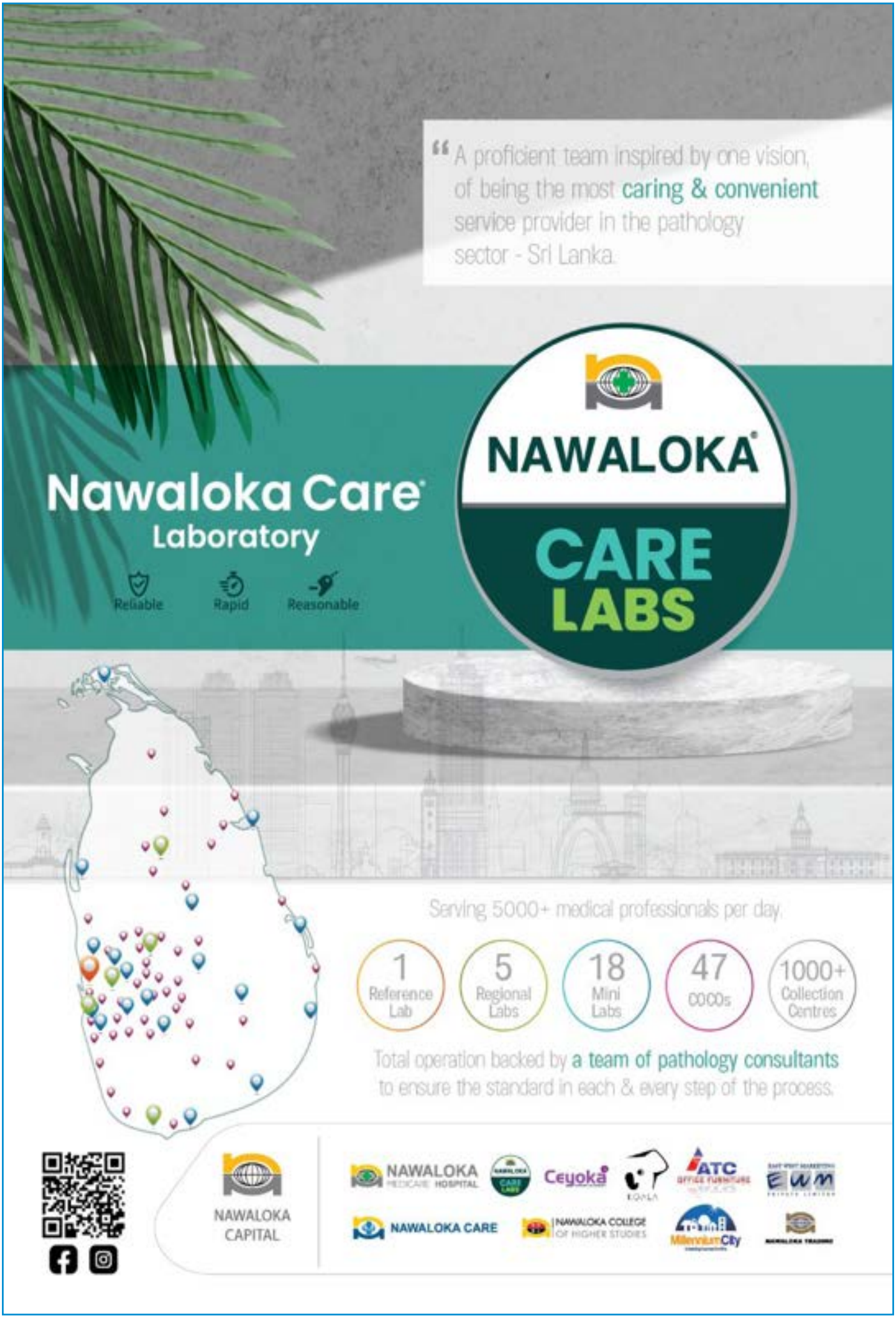
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