Under the Auspices of

COLLEGE OF CHEMICAL PATHOLOGISTS OF SRI LANKA

6TH ANNUAL ACADEMIC SESSION 2021

PROGRAMME & ABSTRACT BOOK

"SUSTAINABLE LABORATORY SYSTEM FOR QUALITY RESULTS"

26TH & 27TH JULY 2021 AT HOTEL HILTON, COLOMBO, SRI LANKA

JULY 2021 | ISSUE NO. 6

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COLLEGE OF CHEMICAL PATHOLOGISTS OF SRI LANKA

"Sustainable Laboratory System for Quality Results"

6th Annual Academic Sessions 2021

Virtual Conference

26th and 27th July, 2021

Colombo, Sri Lanka

CONTENTS

MESSAGE FROM THE PRESIDENT

Dr Rajitha Samarasinghe
MBBS, D. Path, MD (Chem Path), FAACC
Consultant Chemical Pathologist
Head, Department of Pathology
National Cancer Institute
Maharagama, Sri Lanka

It is my pleasure and honor in inviting you to the Annual Academic Sessions of the College of Chemical Pathologists of Sri Lanka (CCPSL AAS 2021) at Hotel Hilton, Colombo on 26th and 27th July 2021. The theme for this year's event is "Sustainable Laboratory System for Quality Results." For the 6th consecutive year, we are bringing the current concepts in Chemical Pathology, 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). CCPSL is a well-established organization in laboratory medicine consisting of Chemical Pathologists and trainees in Chemical Pathology to foster and lead the field of Clinical Chemistry in Sri Lanka. CCPSL is committed to improve the standards of health care services in the country.

This year due to the prevailing COVID-19 pandemic, the event will be virtual which will be a novel concept for all.

It will consist of two academic programmes, designed to update knowledge on the current best practices in Chemical Pathology of medical professional, laboratory professionals and the industry.

There will be a forum of 12 foreign faculty with a wide coverage of current and important topics in Chemical Pathology.

The industrial exhibition this time also will be virtual, delivering the latest technology in Chemical Pathology.

I together with my council cordially invite you to participate in this landmark event of the journey towards integrating laboratory and clinical systems in Sri Lanka.

Dr Rajitha Samarasinghe
6th President
College of Chemical Pathologists of Sri Lanka

MESSAGE FROM THE MINISTER OF HEALTH OF SRI LANKA

Honorable Pavithra Devi Wanniarachchi
Minister of Health

It gives me immense pleasure to write this message to convey my best wishes at the inauguration of the 6th Annual Academic Sessions of College of Chemical Pathologists in 2021.

We are in a crucial era in history as the globe is fighting against a pandemic and the medical laboratories have been working behind the scene tirelessly to diagnose an increasing number of corona virus patients.

It is a commendable move by the College of Chemical Pathologists to organize this event at this critical moment to share and update knowledge among medical professionals in the context of current pandemic situation adapting a virtual approach that can reach a wider audience.

Furthermore, the Ministry of Health wishes to work closely with the College of Chemical Pathologists to improve laboratory facilities and thereby to improve overall patient care.

I extend my best wishes for a successful program and hope that all professionals of the field present here today would benefit immensely by participating in this event.

Honorable Pavithra Devi Wanniarachchi
Minister of Health

MESSAGE FROM THE PRESIDENT OF IFCC

Professor Khosrow Adeli
PhD, FCACB, DABCC, FAACC
IFCC President
International Federation of Clinical Chemistry and Laboratory Medicine (IFCC)

It is my great pleasure to welcome all attendees of the 6th Annual Academic Sessions of the College of Chemical Pathologists of Sri Lanka. Over the past year, the field of clinical chemistry and laboratory medicine has emerged as a leader in innovation in the fight against the global pandemic and continues to make advances in other realms. Our field is rapidly evolving, allowing for a much greater role for laboratory professionals as partners in health care. Indeed, we are moving towards a new vision, shifting focus from specimen-centred to patient-centred laboratory testing services by becoming a partner in clinical care that supports clinical decision making and is faithfully vested in patient outcomes. This timely conference is an excellent opportunity to present and discuss such advances, with an emphasis on current concepts in Chemical Pathology.

The IFCC organization is pleased to partner with and support this conference, enabling scientific exchange and close interactions among pathologists, laboratory professionals, other medical professionals, and laboratory industry partners. Such forums ensure that the field of clinical chemistry and laboratory medicine remains at the cutting edge by fostering collaboration and a culture of innovation. Ultimately, this supports the improvement of the standard of health care services in Sri Lanka and other countries around the world.

I look forward to virtually participating in the excellent scientific programs organized by the College of Chemical Pathologists of Sri Lanka, which include presentations from both local and international speakers as well as industry exhibits. While we cannot meet in person, I am excited to meet many of you virtually and discuss the opportunities and challenges for laboratory medicine over the coming decade. I wish you all an enjoyable and productive conference.

Professor Khosrow Adeli
IFCC President

MESSAGE FROM THE PRESIDENT OF APFCB

Professor Sunil Sethi
MBBS (S'pore), M.Med (Int. Med), MRCP(UK), FRCPath, MAACB, PhD
President
Asia Pacific Federation for Clinical Biochemistry and Laboratory Medicine (APFCB)

Once again, my fellow colleagues, the Asia-Pacific Federation for Clinical Biochemistry and Laboratory Medicine (APFCB) conveys its congratulations to the CCPSL on the occasion of the 6th Annual Academic Session on 26th-27th July 2021.

This year the 2021 Annual Academic Session will be different and the format shaped as a consequence of the current COVID-19 pandemic. For the first time, the meeting will be held as an online format. It is important our educational activities continue despite the difficult situation and it is very commendable of the organizing committee for conducting this meeting.

The CCPSL AAS 2021 will without doubt be another extremely successful meeting. I wish for all the speakers and participants a rewarding time of good science and fruitful networking. On behalf of the Executive Board of the APFCB, allow me to convey my appreciation to the organizing committee of Annual Academic Session 2021.

Have a rich and rewarding time to learn and refresh yourselves at the meeting.

Yours Sincerely,

Professor Sunil Sethi
President, APFCB

MESSAGE FROM THE DIRECTOR GENERAL OF HEALTH SERVICES

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

My warmest congratulations go to the President and council members of the College of Chemical Pathologists of Sri Lanka for organising the 6th Annual Academic Sessions of the college.

In current medical practice the laboratory plays an indispensable role in diagnosis and monitoring of the patient. To provide quality laboratory service it is paramount that the laboratory personnel meet at regular intervals to share their knowledge and experience.

The Annual Academic Sessions provide a platform for professionals to exhibit their knowledge and capabilities and for trainees it is an opportunity to acquire and improve immensely.

Although the current COVID-19 pandemic has limited our chances to meet like in previous sessions, it is a pleasure to see the event has been organized in a way virtual participation is possible.

While extending my best wishes for a successful Annual Academic Session I wish to thank all those involved in organizing this event at such a difficult hour. Further, I assure continuous support for future activities of the college.

Dr. Asela Gunawardena
Director General of Health Services
Ministry of Health, Nutrition and Indigenous Medicine

MESSAGE FROM THE SECRETARY TO THE MINISTRY OF HEALTH

Dr S. H. Munasinghe
MBBS, MD, FSLCR
Secretary to the Ministry of Health
Ministry of Health, Nutrition and Indigenous Medicine

I extend my warmest congratulations to the President and the College of Chemical Pathologists of Sri Lanka for organizing the 6th successive Annual Academic Sessions of the college for 2021 (AAS CCPSL 2021).

As a group of experts, Chemical Pathologists give leadership to the large community of medical laboratory technologists in providing a timely and cost-effective Chemical Pathology service to the public of Sri Lanka and are in the fore front of medical diagnosis and prevention of non- communicable diseases while pursuing avenues of expanding the understanding of the stakeholders by continuous medical education.

Medical laboratory and professional inputs of Chemical Pathologists are invaluable in uplifting patient care. I believe that the AAS, CCPSL will direct the practice of Chemical Pathology both in clinical and technical aspects through dissemination of knowledge to all layers of clinical and clinical chemistry personnel in order to improve patient outcomes. This timely conference will provide continuing professional development and networking opportunities to all in the field of Chemical Pathology in Sri Lanka.

This year the program is challenging I believe, since it is conducted as a hybrid event due to the prevailing COVID-19 pandemic. However, the leadership, vision and hard work of the members of the college are commendable in fulfilling this challenging task.

I take this opportunity to convey my best wishes for a fruitful, scientific and professional program and success in future endeavours of CCPSL.

Dr. S. H. Munasinghe
Secretary to the Ministry of Health
Ministry of Health, Nutrition and Indigenous Medicine

MESSAGE FROM THE DEPUTY DIRECTOR GENERAL (LABORATORY SERVICES)

Dr Sudath K. Dharmaratne
MBBS, MSc, MD (Medical Administration)
Deputy Director General (Laboratory Services)
Ministry of Health, Nutrition and Indigenous Medicine

I pen this message to convey my best wishes to College of Chemical Pathologists of Sri Lanka on the occasion of the 6th Annual Academic Sessions of the college. The College of Chemical Pathologists remains committed in advancing best practices and demonstrating the value of the laboratory professionals to the entire healthcare system.

Chemical Pathologists play a pivotal role in both preventive and curative medicine by providing numerous test facilities which are crucial in diagnosis and management of patients. Their role as technical experts in the field of laboratory medicine by providing required guidance to the laboratory staff is really appreciated.

Furthermore, service provided by College of Chemical Pathologists by organizing continual medical education programmes to update knowledge of all categories of staff involved in laboratory medicine is highly commendable.

The continuous support extended by the CCPSL to the Ministry of Health through collaborative work on policy making and other related important matters is a great strength to the upliftment of the health care services in the country.

There is no doubt that the College of Chemical Pathologists of Sri Lanka Annual Academic Sessions 2021 will be a major contribution for the development and expansion of knowledge on laboratory medicine amidst the COVID-19 pandemic and its challenges. Let me extend my warmest thanks to the organizers of this important conference.

I congratulate and wish CCPSL all the success!

Dr Sudath K. Dharmaratne
Deputy Director General (Laboratory Services)
Ministry of Health, Nutrition and Indigenous Medicine

MESSAGE FROM THE DIRECTOR LABORATORY SERVICES

Dr Vijith Gunasekera
MBBS, MSc (Adm), MEcon, MD (Adm)
Director Laboratory Services
Ministry of Health, Nutrition and Indigenous Medicine

I take this opportunity to congratulate the President, the council and the members of the college for making every effort in continuing their excellent work, particularly in the organization of the event during these challenging times, an event of critical importance in the college calendar. This is a fine moment to showcase scholarly activities, investigative, translational and clinical research undertaken by the trainees, members and acadaemia. Although it is mostly virtual this time, a congregation of this sort creates a perfect platform to recognize and acknowledge the many outstanding contributions made by the members of the College of Chemical Pathologists. The Ministry of Health recognizes laboratory medicine as an essential component of health care and Chemical Pathology plays a pivotal role in the spectrum of diagnostic technologies in Sri Lanka. Hence, I strongly believe that the College of Chemical Pathologists would continue to support advancement of the sciences and its uses both locally and globally. I once again extend my warmest regards and wish every success in all your endeavours.

Dr Vijith Gunasekera
Director Laboratory Services
Ministry of Health, Nutrition and Indigenous Medicine

MESSAGE FROM JOINT SECRETARIES

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

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

We are honoured and privileged to send this message as Joint Secretaries of the College of Chemical Pathologists of Sri Lanka (CCPSL) and to welcome all participants attending the Annual Academic Sessions 2021, on 26th and 27th July 2021 at Hotel Hilton, Colombo, Sri Lanka

Despite the global pandemic and its challenges, the CCPSL is committed to provide timely educational events which are designed to disseminate knowledge and share expertise in the field of Chemical Pathology. The 6th Annual Academic Sessions of the College of Chemical Pathologists of Sri Lanka will be held for the first time on a virtual platform.

The virtual congress will provide local and overseas members, trainees, medical laboratory technologists and delegates a unique opportunity to learn and share educational and scientific content still adhering to the health regulations.

CCPSL AAS 2021 has been organized with the theme of "Sustainable laboratory system for quality results" accompanying parallel sessions for professionals and medical laboratory technologists.

We are honoured to have Dr Asela Gunawardena as the Chief Guest to grace the occasion at the opening of the sessions.

We are grateful to the President of the CCPSL for providing leadership and the council for their enormous support in organizing sessions amidst the COVID-19 pandemic and its challenges .

We express our sincere gratitude to the sponsors, event organizers, the hotel management, college coordinator and all well–wishers for support given to make this event a success.

Thank you for joining us at CCPSL AAS 2021.

EXECUTIVE COUNCIL 2021, COLLEGE OF CHEMICAL PATHOLOGISTS OF SRI LANKA

Sitting (Left to right) : Dr Eresha Jasinge, Dr Ganga Withanapathirana, Dr Chandrika Meegama, Dr Manjula Dissanayake, Dr Rajitha Samarasinghe, Dr Kisali Hirimuthugoda, Dr Thushari K. Withanage, Dr Dulani Jayawardena, Dr H.W.Dilanthi

Standing (Left to right) : Dr Neranjana Vithanage, Dr Dilinika Perera, Dr Sakunthala Jayasinghe, Dr Gawri Abeynayake, Dr Vithegi Kesavan, Dr Saman Peduru Hewa, Dr Thushara Hewageegana, Dr B.K.T.P.Dayanath, Dr Ushani Jayawardane, Dr Gaya Katulanda, Dr Nangai Kularatnam, Dr Deepani Siriwardhana, Dr Thamara Herath, Dr S.I. Majitha

Absent : Dr Roshitha De Silva

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		Dr Saman Peduru Hewa
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		Dr Dilinika Perera
		Dr Neranjana Vithanage
		Dr Ushani Jayawardane
		Dr Nangai Kularatnam
		Dr Gawri Abeynayake

PROGRAMME

ACADEMIC PROGRAMME

COLLEGE OF CHEMICAL PATHOLOGISTS OF SRI LANKA Annual Academic Sessions 2021 (CCPSL AAS 2021) Academic Programme (Virtual)		
Day 1 : 26th July 2021		
TIME	**TOPIC**	**LECTURER**
7.30 – 8.00 am	**Registration**	
8.00 – 8.40 am	**Plenary 1** **Where does the future hold for LC-MS assays**	Dr Victoria Zhang
8.40 – 9.40 am	**Symposium 1: Molecular Diagnostics**	
8.40 – 9.10 am	Whole genome sequencing – Clinical applications	Prof Leslie Burnett
9.10 – 9.40 am	The complex molecular genetics of familial hypercholesterolaemia	Prof John Burnett
9.40 – 10.30 am	**Tea**	
10.30 – 11.30 am	**Symposium 2: Medico-Legal Procedures**	
10.30 – 11.00 am	Laboratory ethics	Dr Saman Peduruhewa
11.00 – 11.30 am	Screening procedures in toxicology	Dr Sameera Gunawardena
11.30 – 12.10 pm	**Plenary 2** **Markers of liver fibrosis**	Prof Madunil Niriella
12.10 – 1.30 pm	**Lunch**	
1.30 – 2.30 pm	**Symposium 3: Pregnancy and Newborn Screening**	
1.30 – 2.00 pm	Liver diseases in pregnancy	Prof Hemantha Senanayake
2.00 – 2.30 pm	Screening for inborn errors - Australian experience	Dr James Pitt
2.30 – 3.30 pm	**Symposium 4: Laboratory Information System**	
2.30 – 3.00 pm	Clinical laboratory informatics and patient care	Prof Sunil Sethi
3.00 – 3.30 pm	Laboratory information system – Issues to be expected and trouble shooting	Dr BKTP Dayanath
3.30 – 4.30 pm	**Oral Presentations**	
	Tea	
Industrial Exhibition Closes at 5.00 pm		

ACADEMIC PROGRAMME

COLLEGE OF CHEMICAL PATHOLOGISTS OF SRI LANKA Annual Academic Sessions 2021 (CCPSL AAS 2021) Academic Programme (Virtual)		
Day 2 : 27th July 2021		
TIME	**TOPIC**	**LECTURER**
7.30 – 8.00 am	**Registration**	
8.00 – 8.40 am	**Plenary 3** **Macrotroponin detection by high sensitivity troponin assays**	Prof Hans Schneider
8.40 – 9.40 am	**Symposium 5: Diabetes Mellitus**	
8.40 – 9.10 am	Assessment of glycaemic control by HbA_{1c} – Limitations	Dr Ivan Lam
9.10 – 9.40 am	The need to standardize diabetes testing and reporting in Asia-Pacific	Dr Samuel Vasikaran
9.40 – 10.20 am	**Plenary 4** **Investigating porphyrias**	Dr Christopher Florkowski
10.20 – 10.50 am	**Tea**	
10.50 – 11.50 am	**Symposium 6: Endocrine Disorders**	
10.50 – 11.20 am	Thyroid autoantibodies – In clinical practice	Dr Manilka Sumanatilleke
11.20 – 11.50 am	Investigating a patient with uncontrolled hypertension	Dr Kushan Medagoda
11.50 – 12.30 pm	**Plenary 5** **Lipids, lipoproteins and atherosclerotic cardiovascular disease risk**	Prof John Burnett
12.30 – 1.30 pm	**Lunch**	
1.30 – 2.30 pm	**Symposium 7: COVID-19**	
1.30 – 1.50 pm	IFCC guidelines on molecular diagnostic testing of SARS-CoV-2 viral infection	Prof Giuseppe Lippi
1.50 – 2.10 pm	IFCC's Response to COVID-19 Pandemic: Evidence-Based Serology Guidelines	Prof Khosrow Adeli
2.10 – 2.30 pm	IFCC interim guidelines on biochemical and haematological monitoring of patients with COVID-19	Prof Andrea Rita Horvath
2.30 – 3.10 pm	**Plenary 6** **Monoclonal gammopathy of renal significance and light chain disease**	Dr Rohan Pulleperuma
3.10 – 3.50 pm	**Plenary 7** **Clinical implications of renal stone analysis**	Dr Anuruddha Abeygunasekera
3.50 pm onwards	**Closing Ceremony and Tea**	
Industrial Exhibition Closes at 5.00 pm		

MEDICAL LABORATORY SCIENCE PROGRAMME

COLLEGE OF CHEMICAL PATHOLOGISTS OF SRI LANKA Annual Academic Sessions 2021 (CCPSL AAS 2021) Medical Laboratory Science (MLS) Programme (Virtual)		
Day 1 : 26th July 2021		
TIME	**TOPIC**	**LECTURER**
7.30 – 8.30 am	**Registration**	
8.30 – 9.10 am	**Inauguration**	
9.10 – 9.35 am	Quality indicators in laboratory medicine	Dr Gaya Katulanda
9.35 – 10.00 am	Electrolyte abnormalities – Drug induced	Dr H.W.Dilanthi
10.00 – 10.30 am	**Tea**	
10.30 – 10.55 am	Laboratory role in the monitoring of DM	Dr Dulani Jayawardena
10.55 – 11.20 am	Analyzer verification procedures	Dr Manjula Dissanayake
11.20 – 11.45 am	Getting accredited-the way forward	Dr Deepani Siriwardhana
11.45 – 12.10 pm	Thyroid function tests – From sampling to reporting	Dr Dilinika Perera
12.10 – 1.10 pm	**Lunch**	
1.10 – 1.35 pm	COVID-19 – Sample handling	Dr Thushara Hewageegana
1.35 – 2.00 pm	Laboratory safety	Dr Vithegi Kesavan
2.00 – 2.25 pm	Interpretation of EQAS returns	Dr Sakunthala Jayasinghe
2.25 – 3.00 pm	**Tea**	
3.00 – 3.25 pm	Various immunoassay techniques and their uses	Dr Gawri Abeynayake
3.25 – 3.50 pm	Liver function tests	Dr Kisali Hirimuthugoda
3.50 – 4.15 pm	24-hour urine tests	Dr Ganga Withana-pathirana
Industrial Exhibition Closes at 5.00 pm		

MEDICAL LABORATORY SCIENCE PROGRAMME

COLLEGE OF CHEMICAL PATHOLOGISTS OF SRI LANKA Annual Academic Sessions 2021 (CCPSL AAS 2021) Medical Laboratory Science (MLS) Programme (Virtual)		
Day 2 : 27th July 2021		
TIME	**TOPIC**	**LECTURER**
7.30 – 9.00 am	**Registration**	
9.00 – 9.30 am	Keep your bones strong with calcium and vitamin D	Dr Nangai Kularatnam
9.30 – 10.00 am	**Tea**	
10.00 – 10.30 am	Serum protein electrophoresis – essentials to know	Dr Thamara Herath
10.30 – 11.00 am	Chromatographic methods	Dr D. N. Senanayake
11.00 – 11.30 am	Handling of samples with medico-legal importance	Dr S.I.Majitha
11.30 – 12.00 noon	Next generation sequencing techniques	Dr Thathsarani Withanapathirana
12.00 – 1.00 pm	**Lunch**	
1.00 – 1.30 pm	Renal function tests	Dr Neranjana Vithanage
1.30 – 2.30 pm	Quiz	Dr J.A.P. Sanjeewani Dr I.N. Jayasinghe Dr T.V. Manawadu
2.30 – 3.00 pm	**Tea**	
3.00 – 3.30 pm	Lipid profile	Dr Chandrika Meegama
3.30 – 4.00 pm	Common assay interferences encountered in Chemical Pathology	Dr Thushari Withanage
4.00 – 4.15 pm	Prize giving and vote of thanks	
Industrial Exhibition Closes at 5.00 pm		

INAUGURATION PROGRAMME

7.00 pm - Invitees take their seats

7.15 pm - Ceremonial procession

7.20 pm - National anthem

7.25 pm - Lighting of the traditional oil lamp

7.35 pm - Welcome address by Dr. Dulani Jayawardana – Joint Secretary CCPSL

7.45 pm - Induction of the new President by Dr. Manjula Dissanayaka – Immediate Past President CCPSL

8.00 pm - Presidential address by Dr. Rajitha Samarasinghe

8.15 pm - Address by the Chief Guest

8.25 pm - Award of the medal to Past President

8.30 pm - Award of CCPSL felicitations

8.35 pm - Award of Chemical Pathology Gold Medal

8.40 pm - Award of CCPSL Fellowships

8.45 pm - Vote of thanks by Dr. Ganga Withanapathirana – Joint Secretary CCPSL

8.55 pm - Ceremonial procession leaves

9.00 pm - Reception

FELLOWSHIP AWARDS

FELLOWSHIP AWARDS

Dr Eresha Jasinge
MBBS, Dip Path, MD (Chemical Pathology)
Consultant Chemical Pathologist

Dr Eresha Jasinge was born on 10th May 1964, and hails from the beautiful Southern Province. She initiated her education at Visakha Vidyalaya, Colombo. Being a star student at school winning multitude of prizes, she entered the Faculty of Medicine, University of Colombo, embarking on another chapter in her life. She successfully completed and earned her MBBS in 1992.

Her enthusiasm and unquenching thirst for answers drove her to pursue postgraduate training in Chemical Pathology at the Postgraduate Institute of Medicine, University of Colombo where she received her Diploma in Pathology and MD in Chemical Pathology in the years of 1997 and 1999, respectively. She received her training under the mentorships of Dr Saroja Siriwardene and late Dr Meliyanthi Gunatillaka.

She continued her overseas training at Royal Prince Alfred Hospital, Australia under the supervision of Dr Peter Stewart and Dr David Sullivan, with specialized training in Paediatric Chemical Pathology at Children's Hospital at Westmead, Sydney, Australia under the guidance of Dr John Coakley.

Since the days in her final year as a medical student, a fact that burdened her during her paediatric appointments was the children with clinical features such as large heads, developmental delay, neurological disabilities, seizures and cognitive impairment with no definitive diagnosis due to the lack of diagnostic resources at that time in the country. She was empathetic towards these children with inborn errors of metabolism, and their parents who suffered due to no proper diagnosis or delay in diagnosis. She wished that she had the opportunity to help these children and parents by assisting to arrive at a diagnosis in a timely manner.

Fate found a way to this determined young specialist when she received her appointment in 2002, as the first Chemical Pathologist at the Lady Ridgeway Hospital for Children, Borella, the largest Children's Hospital in South Asia.

FELLOWSHIP AWARDS

She set sail on this remarkable journey amidst many storms in establishing the first and only metabolic laboratory in the country to date, dedicated for diagnosing inborn errors of metabolism. She initiated the sweat test analysis for cystic fibrosis at the Children's Hospital, the only center in the country offering this service. Many qualitative and quantitative tests were also started to screen for lysosomal storage disorders and porphyria. Furthermore, to her credit, she pioneered the establishing of high-performance liquid chromatography and gas chromatography-mass spectrometry assays to analyze plasma amino acids and urine organic acids.

We are proud to say that even with the limited treatment options available in our country, there are a number of survivors with inborn errors because of the timely diagnoses and the parents are forever grateful. She had the privilege of collaborating with many specialists and organizations, local and overseas, which enabled the Sri Lankan children to have a genetic confirmation of the disease, which would have been otherwise a mere dream for most families. Her great care towards the patients was extended even after the patient was diagnosed and followed-up. The journey is yet to be completed.

While the struggle to establish a metabolic laboratory was going on, she was able to improve the quality of the existing Chemical Pathology laboratory in all aspects of the total testing process. The laboratory of the Lady Ridgeway Hospital has won the confidence of the medical team for issuing reliable and quality reports.

In the past, the general belief as to the role of a Chemical Pathologist was supervising the laboratory and authorization of reports. Dr Jasinge took a giant step in challenging this and she improved liaison with clinicians in investigating patients and expanding the role of a Chemical Pathologist.

Dr Jasinge has contributed to the training of many successful Chemical Pathologists. I, myself had the privilege of training under her guidance. She was both a mentor and a friend and sometimes a mother throughout my journey. With her impeccable focus to detail, the thirst to find answers to the "Why?" and determination towards achieving goals, the training I received under her wings was truly life changing.

She has contributed to numerous local and international publications all involving disorders of inborn errors of metabolism with a special interest in urea cycle disorders and organic acidaemias.

She has been the chief examiner for both Diploma and MD in Chemical Pathology examinations and a member of the Board of Study in Pathology, Postgraduate Institute of Medicine, University of Colombo. As a senior council member and the editor of Sri Lanka College of Chemical Pathologists, her contribution to uplift the standards of the college is remarkable.

FELLOWSHIP AWARDS

She is a strong believer in teamwork and readily gives credit to everyone who has contributed to the success story of the Department of Chemical Pathology at the Lady Ridgeway Hospital, from the directorial positions at the ministry and hospital, clinicians, the trainees, medical officers, medical laboratory technologists to the supporting laboratory staff. She always tries to inculcate this attitude in trainee Chemical Pathologists as well.

Dr Eresha is someone who values and enjoys family life and she is the loving wife of Dr Duminda Munidasa and the wonderful mother of daughter Helani and son Siyal. Her husband, Dr Duminda Munidasa, has been the pillar of support throughout her journey. Further, she is someone who enjoys herself as a poet, a nature lover and recently as a nature photographer.

People who strive to give the world their best and expect nothing in return are rare and few. Dr Jasinge is one such professional who continues to show us that the life's deepest joy comes from selfless contribution.

INTERNATIONAL GUEST FACULTY

INTERNATIONAL GUEST FACULTY

Professor Khosrow Adeli

PhD, FCACB, DABCC, FAACC

IFCC President

1. Head of Clinical Biochemistry, Department of Paediatric Laboratory Medicine
   The Hospital for Sick Children
2. Full Professor of Clinical Biochemistry
   University of Toronto, Canada

Dr Adeli is the Head of Clinical Biochemistry in the Department of Paediatric Laboratory Medicine, as well as a Senior Scientist in the Molecular Medicine Program of the Research Institute, at the Hospital for Sick Children in Toronto, Canada. He is also a Full Professor at the University of Toronto. Currently, he serves as President of the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC). Since 1988, Dr Adeli has been actively involved in molecular and clinical laboratory research, publishing over 600 articles and abstracts to date.

Professor John Burnett

1. Department of Clinical Biochemistry, PathWest Laboratory Medicine,
   Royal Perth Hospital and Fiona Stanley Hospital Network
2. School of Medicine, University of Western Australia

Prof John Burnett is a Consultant Chemical Pathologist in the Department of Clinical Biochemistry at PathWest Laboratory Medicine, Royal Perth Hospital and Fiona Stanley Network and Clinical Professor in the School of Medicine at the University of Western Australia. He is the RCPA Chief Examiner in Chemical Pathology.

INTERNATIONAL GUEST FACULTY

Professor Leslie Burnett
MBBS, BSc (Med), MSc (Bioinf), PhD, DBA, FRCPA, FHGSA, FCAP
Garvan Institute of Medical Research
Darlinghurst, Sydney, NSW, Australia

Dr Leslie Burnett is a dual-Scope of Practice Chemical Pathologist and Genetic Pathologist, and is Principal Medical Geneticist and Medical Director at the Garvan Institute of Medical Research in Sydney, Australia. He established Australia's first Community Genetics screening program and was Medical Director of Australasia's first Whole Genome Sequencing laboratory. He has served as Chairman or President of several National and International bodies in pathology and genetics.

Professor Burnett is Conjoint Professor at the St Vincent's Clinical School, UNSW Sydney and Honorary Professor in Pathology and Genetic Medicine in the Northern Medical School of the University of Sydney.

Leslie's current interests are in genomic pathology, genetic screening, and bioinformatics. He is a passionate teacher and communicator about the genomics revolution.

Professor Christopher Florkowski
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Prof Chris is a Consultant in Chemical Pathology and Associate Professor in Pathology at the University of Otago, Christchurch. He has diverse research interests, including Porphyria for which he has served over 10 years on the Australasian Working Party, attended many major international conferences and presented the 2013 Roman Lecture series for the Australasian Association of Clinical Biochemistry (AACB) on the topic of Porphyria. His main focus is on how laboratory tests leverage clinically important decision making and he served for several years on the Committee of Evidence Based Laboratory Medicine (EBLM) of the International Federation of Clinical Chemistry (IFCC).

INTERNATIONAL GUEST FACULTY

Professor Rita Horvath
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Prof ANDREA RITA HORVATH, MD, PhD, FRCPath, FRCPA is Clinical Director of Chemical Pathology, NSW Health Pathology at Prince of Wales Hospital in Sydney, Australia. Her key research areas are evidence-based laboratory medicine and evaluation of biomarkers and effectiveness and safety of laboratory testing. One of the three senior editors of the 6th edition of the Tietz Textbook and the 8th edition of the Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics. Currently she is chairs an EFLM Task Group on Outcome-Based Analytical Performance Specifications for Tests and she is a member of IFCC's COVID-19 Task Force.

Dr Ivan Lam
Scientific Affairs Manager (APAC)
Sebia

Dr Ivan Lam graduated from Singapore's Nanyang Technological University (NTU), School of Biological Sciences (SBS) as a selected few under the accelerated Bachelor (Hons) program. Dr Lam was awarded a PhD through the NTU Research Scholarship, did his postdoctoral research fellowship and became Research Group leader in NTU, School of Material Sciences and Engineering (MSE), which is currently QS ranked 1st in the world by subject. Throughout his time in academic research, Dr Lam had extensive experience in protein separation techniques in molecular biology research areas including proteomics, endocrinology, dermatology, oncology, tissue engineering and cross disciplinary research. He had also served as peer reviewer and published in high impact journals. Dr Lam was also previously from pharmaceutical medical affairs of Merck Sharp & Dohme and Johnson & Johnson where he had successfully led companion diagnostic testing programs and medical education efforts to improve patient outcomes.

INTERNATIONAL GUEST FACULTY

Professor Giuseppe Lippi
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Prof Giuseppe Lippi was born in Padova (Italy) on October 4th, 1967. He has taken the degree in Medicine in 1992 and the specialization in Clinical Biochemistry and Laboratory Medicine in 1996. He currently serves as Full Professor of Clinical Biochemistry and Molecular Biology at the University of Verona (Italy) and Director Laboratory Service of the University Hospital of Verona (Italy). He has published over 1800 articles in peer-reviewed journals, his total Impact Factor is 6900 and the Hirsch Index (H-index) is 106. He has participated to more than 600 national and international congresses and has given more over 300 lectures to national and international meetings. In 2017 he has been appointed as Secretary of the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM) and he currently chairs the Task Force on COVID-19 of the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC). He has been awarded with the 2014 Management Sciences and Patient Safety Division Award of the American Association for Clinical Chemistry (AACC) for outstanding contributions in the field of patient safety in the clinical laboratory/healthcare industry, and with the 2015 Outstanding Speaker Award by the AACC. He has also received research grants from the European Community and from Regional Heath Care Services. Giuseppe Lippi is Editor in Chief of "Annals of Translational Medicine" and "Journal of Laboratory and Precision Medicine" and also serves as Associate Editor of the journals "Clinical Chemistry and Laboratory Medicine", "Seminars in Thrombosis and Hemostasis" and "Diagnosis", is National Representative of the Italian Society of Clinical Biochemistry and Laboratory Medicine (SIBioC) and member of the European Federation of Laboratory Medicine (EFLM) Working Group on Preanalytical Variability (WG-PRE). The main fields of research include COVID-19, analytical and clinical validation of phenotypic and molecular biomarkers, diagnostics of thrombotic and haemorrhagic disorders and relevant assay methods, pre-analytical variability.

INTERNATIONAL GUEST FACULTY

Dr James Pitt
BSc, PhD
Victorian Clinical Genetics Services
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Dr James is a Biochemical Geneticist with over 30 years of experience in the field. He is Head of the Newborn Screening and Metabolic Screening Laboratories, Victorian Clinical Genetics Services, Murdoch Children's Research Institute. These laboratories perform biochemical screening of all Victorian newborns and older children with clinical indications of an inborn error of metabolism. The laboratories are also a referral centre for Australia and South East Asia for several specialised tests. James' research interests focus on using mass spectrometric and chromatographic techniques to discover new genetic disorders, identify new biomarkers and improve diagnostic techniques for inborn errors of metabolism.

Professor Hans Schneider
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Prof Schneider trained in Heidelberg, Germany in Medicine, and as a Chemical Pathologist and Endocrinologist in Melbourne. He has been the Chemical Pathologist and the Director of the Alfred Pathology Service since 1997. He is also an adjunct Clinical Professor at Monash University. Special interests include: the introduction of new testing, new technologies and quality improvement activities. He is a current member of NPAAC (National Pathology Accreditation Advisory Council) and a past President of Public Pathology Australia.

INTERNATIONAL GUEST FACULTY

Professor Sunil Sethi

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Associate Professor Sunil Sethi is a Senior Consultant Chemical Pathologist and the Head, Clinical Chemistry Division of the Department of Laboratory Medicine at the National University Hospital, Singapore. He is the Group Director of Laboratory Medicine for the National University Health System (NUHS).

After his basic medical degree, Associate Professor Sethi obtained his specialist qualifications in Internal Medicine and Chemical Pathology from the Royal Colleges of Medicine (FRCP) and Pathologists (FRCPath), UK and a PhD from the University of Surrey, UK. He is the President of both the Singapore Association of Clinical Biochemists (SACB) and the Asia Pacific Federation for Clinical Biochemistry & Laboratory Medicine (APFCB). He is an Executive Board Member of the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC). He sits on numerous local, regional and international committees and advisory panels. He runs a regular lipid clinic and has research interests in laboratory processes and lipid metabolism.

Dr Samuel Vasikaran

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Dr Sam Vasikaran is a graduate of Colombo Medical College, and is currently Consultant Chemical Pathologist at PathWest – Laboratory Medicine, Western Australia. He is Chair of the APFCB Scientific Committee. He has published over 130 peer reviewed publications and book chapters.

INTERNATIONAL GUEST FACULTY

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Victoria Zhang, PhD, MBA, is Director of Clinical Chemistry Division and Vice Chair for Clinical Enterprise Strategy of the Department of Pathology and Lab Medicine at the University of Rochester Medical Center. She is the Founding Chair of the AACC Mass Spectrometry and Separation Sciences (MSSS) division and organized many conferences, workshops to enhance the applications of mass spectrometry in clinical diagnostics. Dr. Zhang is currently the founding Faculty Chair for AACC Global Lab Quality Initiative Asia-Pacific Working Group, the Chair of AACC Academy Membership Committee, member of AACC Finance Committee and the 2021 AACC Annual Meeting Organizing Committee.

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SPEAKER ABSTRACTS

DAY 1

Where Does the Future Hold for LC-MS/MS in the Clinical Laboratories

Dr Victoria Zhang

Mass spectrometry has been proven to be one of the fast growing and a very powerful platform for the clinical diagnostic. The increasing application of mass spectrometry in clinical analysis, such as drug of confirmation, hormones, steroids, therapeutic drugs, microbiology and peptide measurement, have brought a tremendous amount of excitement in the field of clinical chemistry and clinical diagnostics. The lecture will provide the cutting-edge development in this field, the emerging applications of mass spectrometry as well as the challenges and the national and international efforts that have taken place to further the growth of this exciting field for the betterment of patient care.

Whole Genome Sequencing – Clinical Applications

Professor Leslie Burnett

The human genome is present in almost all our cells and contains nearly the entire information content required for all stages of life. The dream has been that if we could sequence the genome, then it should be possible to understand the fundamental instructions of our cells, and from that to understand our biological processes in both health and disease.

This is now potentially possible.

In 2003, at the completion of the 15-year-long Human Genome Project, the 3.3 billion base pairs that form the human genome were first sequenced. The project involved a world-wide collaboration by many research groups and ended up costing more than USD$5 billion. By 2018, the Guinness World Record stood at sequencing the genome of an ill neonate and making a genomic diagnosis in just 20 hours in a single laboratory, and of analysing 1,000 already-sequenced human genomes in under three hours. These speeds already rival the turn-around times of some traditional laboratory tests, and they continue to accelerate.

My presentation will explain how whole genome sequencing and analysis is performed. Primary examples will be given of how this technology can be applied to the diagnosis of rare Mendelian disorders, but insight will be given into the emerging fields of common but complex multifactorial disorders, including pharmacogenomics, non-Mendelian and somatic cell disorders and cancer.

By applying and adapting strategies used in other traditional laboratory disciplines, it is possible to scale these techniques to population-wide testing and screening programs, making use of automation and quality management to handle samples and information at volume, and big data and assisted intelligence to interpret results at speed.

DAY 1

Complex Molecular Genetics of Familial Hypercholesterolaemia

Professor John Burnett

Familial hypercholesterolaemia (FH) is the most common genetic disorder causing premature atherosclerotic cardiovascular disease (ASCVD). However, most patients are undiagnosed, and treatment is often suboptimal even when the diagnosis seems certain. Several scoring algorithms based on LDL-cholesterol levels, physical findings, and elements of personal and family history, help clinicians diagnose FH at varying levels of confidence ranging from possible to definite. Advances in molecular technologies are reshaping our understanding of this condition, including revision upwards of the population prevalence to 1:250 worldwide. Additionally, the underlying pathophysiological complexity has been exposed by the range of causative genetic loci, breadth of types and classes of rare disease-causing variants, and polygenic basis of the phenotype in many patients. Genetic testing is not always helpful or definitive. Targeted DNA sequencing to identify the underlying pathogenic variant in any of the three FH genes (LDLR, APOB, and PCSK9) has become more accessible, but it is not essential for diagnosis of FH, and is currently not widely used. However, identification of a pathogenic variant is considered the "gold standard" for FH diagnosis. Expanded FH panels can identify pathogenic variants in other hypercholesterolaemia genes, such as APOE, LIPA, and ABCG5/8. FH cascade screening is recommended to identify affected family members and the benefits of early intervention to lower LDL-cholesterol and reduce the associated ASCVD burden are clear. National registries can also play a key role in identifying patients with FH. FH genetic testing should be incorporated as standard of care for patients and their relatives with suspected FH.

DAY 1

Medical Laboratory Ethics

Dr Saman Peduru Hewa

Ethics are sets of principles described by certain organisations to guide the behaviour on rights and wrongs in specific groups or societies of individuals on practices relevant to them. Laboratory medicine, like any other branch of medicine, is mandated with ethical code of conduct. The ethical attitudes of laboratory professionals influence the kind of people who choose to take services from our profession. Therefore, more open discussions about ethics is necessary to circumvent unpleasant circumstances.

Numerous laboratory professional organizations have developed codes of ethics. Section 4.1.1.3 of the International Organization for Standardization (ISO), ISO 15189:2012, summarizes the ethical conduct expected in laboratories. Similarly, ethical guidelines are established in many aspects of the practice. Some examples include: (i) consent from patients including consent for unforeseen complications (ii) usage of leftover samples and bio banking; (iii) considerations in genetic testing; (iv) implementation of reporting on incidental findings; (v) error disclosure; (vi) role of laboratories in test utilization; (vii) direct to consumer testing.

The responsibility of the laboratory starts with proper identification of the patient or subject, collection of the appropriate sample using the appropriate technique and correct labelling of the sample so that the right tests are performed and appropriate handling of the specimen occur until testing is completed.

Ethics of the analytical phase includes the provision of the best possible analytical results through good laboratory practice. A wrong result is worse than no result. All patient samples need to be treated equally. As we know, discrimination based on gender, age, racial origin, or even socio-economic status is an injustice. However, specimens designated as STAT or priority must be analysed promptly to meet the medical need.

The most important step to ensuring ethical standards and practices in the laboratory is that everybody of the laboratory must recognise it as a shared responsibility which is vested upon them.

DAY 1

Screening Procedures in Toxicology

Dr Sameera Gunawardena

Screening individuals for toxicological purposes including recreational drugs and banned substances is sometimes a mandatory component in certain types of employment and under certain statutory obligations. In Sri Lanka, persons suspected of addiction are referred by courts for clinical and sometimes toxicological testing which raises several ethicolegal dilemmas. Similarly, the recent move by the Ministry of Transport to introduce screening of all commercial and heavy vehicle drivers for drugs of abuse is also likely to cause several ethical conflicts between autonomy, non-maleficence and individual vs societal rights. Although laboratories rarely deal directly with the individuals being tested, the same ethical obligations of informed consent, confidentiality and right to information that exists in clinical situations apply in laboratory testing of samples as well. Laboratory personnel are expected to develop and maintain standard operating procedures on sample collection, storage, analysis and reporting results to ensure that there is no unintended breach of privacy of the individual being tested. Furthermore, with the expanding scope of genetic information that could be obtained through biological samples, laboratories have to be extra vigilant on storage and disposal methods, re-utilisation of left-over samples and conducting experimental or academic research on stored samples. An emerging trend around the world is for laboratories to develop their own ethics review boards which facilitate and monitor the procedures and protocols of testing in such situations.

DAY 1

Markers of Liver Fibrosis

Professor Madunil Niriella

Liver fibrosis should be assessed in all individuals with chronic liver disease as:

- it predicts the risk of future liver-related morbidity and mortality
- to prognosticate, stratify therapeutic and surveillance strategies and evaluate response to treatment over time
- it is a key surrogate end point for clinical trials in patients with CLD allowing expedited approval of efficacious drug treatment

Liver biopsy provides a direct measure of liver fibrosis but has many inherent drawbacks. Non-invasive fibrosis tests (NITs) overcome many limitations of liver biopsy and are now routinely incorporated into routine clinical practice.

These include:

- Serum/blood-based ("Wet") tests
- Simple/Indirect – FIB-4, NFS
- Complex/Direct – ELF, Fibrotest, Hepascore, FibroMeter
- Image-based ("Dry") tests
- 2D-SWE, pSWE
- VCTE (FibroScan)
- MRE

This presentation will discuss the strengths and weaknesses of the above NITs of liver fibrosis, and explore applicability and ways to incorporate these in day-to-day clinical practice.

DAY 1

Liver Diseases in Pregnancy

Professor Hemantha Senanayake

Liver disease in pregnancy could arise as conditions specific to pregnancy or unrelated to pregnancy or due to aggravation of preexisting disease. In general, those that are specific to pregnancy requires early delivery, whereas the others will require supportive treatment only. Features of these conditions may be non-specific and vague, and a high level of suspicion and judicious evaluation becomes vital in achieving optimal outcomes. Some of them carry high mortality rates, with the maternal mortality rates of up to 20% being reported for acute fatty liver of pregnancy (AFLP). Assay of liver transaminases and bilirubin, infectious hepatitis screen and ultrasonography of the liver would suffice to elicit a diagnosis in most cases.

The liver function tests remain largely unchanged during pregnancy, except for alkaline phosphatase, which may be elevated up to three times the non-pregnant level. Spider naevi and palmar erythema that are commonly associated with liver failure are common in pregnancy, due to elevation of the level of circulating estrogens.

The HELLP (haemolysis, elevated liver enzymes, low platelets) syndrome, another condition specific to pregnancy could be potentially lethal and its diagnosis is often missed. Typically, a condition that occurs in hypertensive disease in pregnancy, it may even occur in women who are normotensive. Pruritus is the presenting symptom in some of these women.

Obstetric cholestasis is another condition that may present with pruritus, typically on the palms and soles of feet. It has been related to adverse fetal outcomes, but this notion is being challenged.

Hyperemesis gravidarum, long considered a self-limiting condition of early pregnancy is now being considered under liver disease in pregnancy.

DAY 1

Screening for Inborn Errors - Australian Experience

Dr James Pitt

Approximately 1600 inborn errors of metabolism (IEMs) are currently known. Although individually rare, collectively they represent a significant burden of disease in neonates and children. Early diagnosis is important for optimal treatment outcomes and reproductive planning. Newborn screening is an important first test but is currently limited to approximately 20 – 30 IEMs of amino, organic and fatty acid metabolism. Biochemical testing of symptomatic children can detect a much wider range of IEMs. In the past, this has relied on assessment of the clinical phenotype and results of core lab tests to guide the selection of appropriate biochemical genetics tests. Mass spectrometric techniques have greatly improved the scope of screening and a urine metabolic screen performed using tandem mass spectrometry is now capable of diagnosing a wide range of IEMs with high throughput, meaning that diagnosis is less dependent on clinical triaging. Diagnosis of mitochondrial disorders can still be challenging due to the lack of specific metabolite markers but genomic and proteomic approaches are increasing the diagnostic yield. Genomic testing is being increasingly used to diagnose IEMs but its widespread application is currently limited by considerations of cost, throughput and time-to-result. Furthermore, biochemical testing is still required to resolve variants of uncertain significance in metabolic genes and to monitor response to treatments for diagnosed patients.

Clinical Laboratory Informatics and Patient Care

Professor Sunil Sethi

Informatics plays a pivotal part in laboratory operations. The use of real-time dashboards, business intelligence/ analytics tools, integrating the laboratory's information systems with other sources of data in the organization, are new and interesting possibilities. These processes are necessary to support continuous improvement and patient care.

Auto-verification is a process of using computer-based rules to verify clinical laboratory test results without the need for manual intervention. The vast majority of results should qualify for automatic release, with only a small percentage put on the manual validation queue. Historically, auto-verification rules are derived and refined by individual laboratories as there is scarce published data.

Evidence indicates that an important laboratory process indicator is the requirement to effectively communicate critical laboratory results to the appropriate care-giver in an accurate and timely manner, each and every time this occurs.

The use of point of care testing is traditionally of value in emergency and critical care situations. Recently, the use of such point of care devices, electronically connected to decision support applications, have shown to be of value in and community chronic disease management programs. Laboratory medicine is increasing rapidly and laboratory professionals will increasingly need to manage clinical and patient care issues.

DAY 2

Laboratory Information System – Issues to be Expected and Troubleshooting

Dr BKTP Dayanath

Laboratory information systems (LISs) have evolved into complex applications to meet the specialized needs of laboratories. Integrated delivery systems (IDSs) continue to emerge as a dominant model for healthcare delivery. Laboratories in IDSs must consolidate to reduce costs and duplication yet deliver service across a region in both inpatient and outpatient settings, while IDSs will also increase revenue, generate referrals, leverage excess capacity, and may also provide a competitive advantage.

There are three dimensions to a laboratory information system. The organization that coordinates work through structured hierarchy and operation processes, the people required to run the LIS with the significant impact from the laboratory stakeholders, and the technology that helps improve TAT, reduce costs while increasing competitive advantages.

The LIMS is capable of sample management, instrument integration, procedure execution, and data management, while LIMS workflow begins with the patient registration, followed by test order, sample barcoding & preparation, task allocation, sample analysis, result validation and reporting and post-analysis.

Common problems encountered with implementation and using LIS include inherent problems with the working environment, system design defaults, cultural barriers, hindrances in the process improvement, lack of traceability, faults with integration, and security issues. The troubleshooting of these problems should start with defining the problem with a common agreement, analyzing the issues related to the problem to find the root cause, providing an amenable solution, implementing amendments, and reviewing the outcome. During the implementation of the changes, an organization would face technological and user challenges that need to be overcome with a tactical approach such as appropriate selection hardware and user training. Other general issues to be expected in a LIS include backups, maintenance, system upgrades, and hardware failures.

DAY 2

Macrotroponin- Importance of Immunoglobulin Bound Troponin

Professor Hans Schneider

Troponin assays were introduced in clinical practice in the late 1990s. They have revolutionised the diagnosis of acute myocardial infarction (AMI).

Over the years a number of causes for permanently elevated troponin levels have been described. One of the causes for this can be binding of troponin to autoantibodies and a delayed clearance of the molecule. Methodologies to identify these troponin autoantibodies are: precipitation with polyethylene glycol (PEG), protein G Sepharose separation (binds antibodies and lets unbound troponin molecules flow through), gel filtration with separation by size.

In a prospective study done at the Alfred we investigated patients with a first elevated high-sensitivity cardiac troponin I (cTNI), where we did a parallel measurement with high-sensitivity troponin T (hsTnT). We further investigated patients with discrepant results. We found a discrepant result in about 5% of first elevated troponin results. The main cause of these discrepant results were troponin autoantibodies. Typically, the pattern in these patients was a mildly elevated troponin that did not show the typical rise and fall seen in AMI. However, we also observed a patient with a very high troponin that was stable and showed another spike with an acute ischaemic event. Clinical review of the relevant medical file was helpful in some patients, but it was not sufficient to identify most cases. We found a high percentage of troponin antibodies with the Abbott assay; however, we also have seen autoantibodies specific to troponin T in a referred sample. Currently the clinical impact of the presence of troponin autoantibodies is unclear, although it seems that these patients do better than patients with acute myocardial infarction. Future assays will need to minimise the impact of troponin antibodies on results.

DAY 2

Assessment of Glycaemic Control by HbA_{1c} – Limitations

Dr Ivan Lam

With the rising global incidence and prevalence of diabetes mellitus, it is increasingly important to routinely test HbA_{1c} in the clinic for disease diagnosis and monitoring. However there remains several limitations to HbA_{1c} as an assay, including methodological, analytical interference and biological interference. With different methodologies available today to measure HbA_{1c} such as immunoassay, enzymatic, HPLC and capillary electrophoresis, it is important to understand limitations of each method to choose the HbA_{1c} testing method best suited for your laboratory.

The Need to Standardize Diabetes Testing and Reporting in Asia-Pacific

Dr Samuel Vasikaran

Diabetes mellitus (DM) is a disease of carbohydrate metabolism due to absolute or relative insulin deficiency. Type 2 diabetes (T2DM) is by far the most common form. Nearly one in ten adults worldwide has T2DM, and Asia is a major focus of the T2DM epidemic. Undiagnosed diabetes accounts for about half the cases. Diabetes mellitus is a major cause of blindness, kidney failure, heart attacks, stroke and lower limb amputation. The clinical laboratory has an important role in the diagnosis and management of the disease.

The role of the laboratory in the diagnosis and management of T2DM may be broken down into the: screening, diagnosis, monitoring glycaemic control, assessment of risk factors and detection and management of chronic complications and acute metabolic complications. In addition to offering appropriate tests and ensuring the results are accurate and precise, the laboratory has a major role in education clinicians and patients in choosing the right tests for the purpose and the correct interpretation of results in ensuring the optimum and timely care of patients.

A survey of laboratory practices in diabetes testing within the Asia Pacific region including Sri Lanka has revealed that practices within each country could be better streamlined by following guideline-approved testing practices, using certified methods only and uniform reporting practices and agreed units for reporting and participating in quality assurance of all the tests that they offer. The above survey shows the important role of professional scientific bodies such as CCPSL can play in educating laboratories to adopt certified methods for HbA_{1c} testing, morning spot-urine sample for microalbuminuria testing, agreed uniform units for reporting blood glucose and HbA_{1c} and urine albumin results, as well as raising awareness among obstetricians and laboratory professionals regarding recommendation for OGTT for timely diagnosis of gestational DM.

DAY 2

Investigating Porphyrias

Professor Christopher Florkowski

Porphyrias are inherited disorders of haem synthesis, with enzyme deficiency at one of eight sites (in the pathway) leading to impaired haem formation and thus reduced feedback inhibition of the pathway and accumulation of porphyrins (or precursors) proximal to the block. There are diverse clinical manifestations depending upon the site of the block. With a more proximal block (as in acute intermittent porphyria [AIP] and other acute porphyrias), accumulation of precursors predominates leading to acute neurological and psychiatric features. With a more distal block (as in erythropoietic protoporphyria [EPP]), accumulation of porphyrins confers cutaneous features, including photosensitivity.

The single most important test is urinary porphobilinogen (PBG) – if negative in the presence of symptoms, acute porphyria can be excluded. If porphyria is truly suspected, then urine, blood and faeces should be sent for testing. Clinical diagnosis may be inferred by the patterns of metabolites observed in these samples. Fluorescence emission spectrophotometry of plasma may also provide important clues – with typical 626 nm wavelength in variegate porphyria and 632 nm in EPP. If the clinical and biochemical phenotypes are supportive, then genotyping may be confirmative and provides a basis for cascade family screening in close relatives. Many of the acute porphyrias have low genetic penetrance, although awareness of the condition may inform avoidance of certain drugs that can precipitate acute porphyric crises.

The least uncommon porphyria is porphyria cutanea tarda (PCT), which is non-acute and with predominantly cutaneous features. It is PBG negative and has typical metabolite profiles in urine and faeces.

Thyroid Autoantibodies – In Clinical Practices

Dr Manilka Sumanatilleke

Thyroid disorders are the second most common endocrine problem identified in the community. Although its prevalence is much lower than the leading cause - diabetes, there is an increasing incidence of autoimmune thyroid disorders being diagnosed. It may be partly due to the increased availability of thyroid function tests and thyroid antibody tests and the increase in iodine intake through iodized salt and other means. Thyroid antibody tests have become very useful tools for clinicians in the diagnosis and management of thyroid disorders. The commonly used ones are the Thyroid peroxidase antibody (TPO Ab), TSH receptor antibody (TRAb) and Thyroglobulin antibody (Tg Ab).

TPO antibodies are caused by the TPO present in the apical surface of thyroid follicular cells which is the antigen involved in the cell mediated cytotoxicity. TSH receptor antibodies can be either stimulatory or inhibitory depending on the part of the TSH receptor antigen (A or B) but it's not measured separately in Sri Lanka.

TPO antibodies are very useful in the evaluation of a goitre diagnosis of Graves disease and Hashimoto thyroiditis and in the management of subclinical hypothyroidism. TRAb is very useful in the differential diagnosis of transient thyrotoxicosis of pregnancy and Graves disease, neonatal thyrotoxicosis and postpartum thyroiditis.

Thyroglobulin antibodies are useful in monitoring thyroid cancers where it's positivity will give a falsely low level of serum thyroglobulin which will affect the long-term management decisions of the condition.

Studies have shown that these antibodies, specially TPO antibodies are positive in people up to seven years before the disease manifest. About 8-12% of the population will have the antibodies without a goitre or any abnormality in the thyroid function tests. In contrast the positivity of TRAb tends to go up closure to the disease manifestation.

TPO antibodies can be associated with other autoimmune conditions, cancers and other nonthyroidal illnesses. TRAb is associated with Graves orbitopathy and dermopathy. Availability of thyroid antibodies has improved the quality of management of people with thyroid disorders.

DAY 2

Investigating a Patient with Uncontrolled Hypertension

Dr Kushan Medagoda

Hypertension increases the risk of strokes, coronary artery disease, chronic heart failure and end-stage renal disease.

Full renal function tests, lipid profile, fasting glucose levels are the basic blood investigations performed in a patient with hypertension. Urinalysis for albumin, active urinary sediments and dysmorphic red cells are important to identify the renal etiology.

Resistant hypertension is defined as seated BP >140/90 mmHg in a patient, treated with three or more antihypertensive medications at optimal or maximally tolerated doses and one of them being a diuretic. It is multifactorial in etiology. However careful evaluation is needed to exclude the possibility of pseudo-resistant hypertension.

The gold-standard method to exclude the pseudo-resistant hypertension due to nonadherence of medications is to measure the level of urinary excretion of the drugs or their metabolites. A urine sample is collected after the medications and then the sample is analyzed for relevant drug metabolites, using high-performance liquid chromatography. This is not much developed in Sri Lanka and the college must initiate to develop these advances as it is helpful in toxicology studies also.

Secondary causes for the resistant hypertension include hyperaldosteronism, glucocorticoid remediable aldosteronism, pheochromocytoma, Cushing syndrome, renal artery stenosis and coarctation of aorta.

Hyperaldosteronism

The aldosterone/renin ratio is an effective screening test for primary hyperaldosteronism. A high ratio of 20 to 30 is suggestive of primary hyperaldosteronism.

Pheochromocytoma and paraganglioma

The main diagnostic criteria are elevated urinary catecholamines, metanephrines and elevated plasma free metanephrines. Plasma levels of chromogranin A is used to detect recurrent pheochromocytomas. 24-hour urine VMA has a poor sensitivity and specificity and is of obsolete use now.

Cushing syndrome

The dexamethasone suppression test (DST) is used in the evaluation of endogenous Cushing syndrome assessing for the lack of suppression of the hypothalamic-pituitary-adrenal axis by exogenous corticosteroids.

DAY 2

Lipids, Lipoproteins and Atherosclerotic Cardiovascular Disease Risk

Professor John Burnett

LDL is the predominant atherogenic lipoprotein particle in the circulation. Conventionally, a fasting lipid profile has been used for atherosclerotic cardiovascular disease (ASCVD) risk assessment. A non-fasting sample is now regarded as a suitable alternative to a fasting sample. In routine clinical practice, the Friedewald equation is used to estimate LDL-cholesterol, but it has limitations. Commercially available direct measures of LDL-cholesterol are not standardised. LDL-cholesterol is a well-established risk factor for ASCVD, being the primary therapeutic target in both primary and secondary prevention. Non-HDL-cholesterol is a measure of the cholesterol content in the atherogenic lipoproteins, but it does not reflect the particle number. Non-HDL-cholesterol has the advantage over LDL-cholesterol of including remnant cholesterol and being independent of triglyceride (TG) variability, but it is compromised by the non-specificity bias of direct HDL-cholesterol methods used in the calculation. ApoB, the major structural protein in VLDL, IDL, LDL and Lp(a), is a measure of the number of atherogenic lipoproteins. ApoB methods are standardised, but the assay comes at an additional, albeit relatively low cost. Non-HDL-cholesterol and apoB are more accurate measures than LDL-cholesterol in hypertriglyceridaemic individuals, non-fasting samples, and in those with very-low LDL-cholesterol levels. Accumulating evidence suggests that non-HDL-cholesterol and apoB are superior to LDL-cholesterol in predicting ASCVD risk, and they have both been designated as secondary targets in some guidelines. More recently, there has been a revival of plasma TG as a risk factor and likely causal agent for ASCVD. Concurrently, a consensus opinion has emerged that HDL-cholesterol is no longer an independent direct actor in ASCVD, although it remains a clinically valuable predictor of risk.

IFCC Guidelines on Molecular Diagnostic Testing of SARS-CoV-2 Viral Infection

Professor Giuseppe Lippi

The diagnosis of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection globally has relied extensively on molecular testing, contributing vitally to case identification, isolation, contact tracing, and rationalization of infection control measures during the coronavirus disease 2019 (COVID-19) pandemic. Clinical laboratories have thus needed to verify newly developed molecular tests and increase testing capacity at an unprecedented rate. As the COVID-19 pandemic continues to pose a global health threat, laboratories continue to encounter challenges in the selection, verification, and interpretation of these tests. This lecture on behalf of the International Federation for Clinical Chemistry and Laboratory Medicine (IFCC) Task Force on COVID-19 will hence provide information on: (A) clinical indications and target populations, (B) assay selection, (C) assay verification, and (D) test interpretation and limitations for molecular testing of SARS-CoV-2 infection. These evidence-based recommendations will provide practical guidance to clinical laboratories worldwide and highlight the continued importance of laboratory medicine in our collective pandemic response.

DAY 2

IFCC's Response to COVID-19 Pandemic: Evidence-Based Serology Guidelines

Professor Khosrow Adeli

In early 2020, the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) established the IFCC Taskforce on COVID-19 to summarize, critically review, and disseminate the most up-to-date, evidence-based information about the novel coronavirus as well as provide recommendations regarding test implementation. Since its establishment, the Taskforce has published numerous resources and guidelines, which have been extremely valuable for healthcare professionals in the continuously changing landscape of research and development related to COVID-19.

Indeed, the COVID-19 pandemic has led to the unprecedented development of new serological assays to detect SARS-CoV-2 antibodies, and the demand for these assays has grown rapidly due to their valuable application in identifying past infection as well as monitoring antibody response to past infection or vaccination. However, there has been limited information available regarding their analytical and clinical performance, and thus their clinical utility, for routine applications in this pandemic. To address these gaps, the Taskforce published the IFCC Guidelines on Serological Testing of Antibodies against SARS-CoV-2, which provides interim guidance on: A) clinical indications and target populations, B) assay selection, C) assay evaluation, and D) test interpretation and limitations, to assist laboratories in selecting, validating, and implementing regulatory-approved serological assays. I will discuss these guidelines and the latest evidence on their analytical and clinical performance.

DAY 2

IFCC Interim Guidelines on Biochemical and Haematological Monitoring of Patients with COVID-19

Professor Andrea Rita Horvath

Laboratory testing is essential in the fight against the SARS-CoV-2 pandemic. Routine haematology and biochemistry tests lack specificity to diagnose SARS-CoV-2 infection but they assist in the management, risk stratification, monitoring and prognosis of patients hospitalized with COVID-19.

IFCC's COVID-19 Task Force reviewed the evidence and provided guidance on the clinical indications for testing, including test selection and interpretation of conventional haematology and biochemistry tests in COVID-19. This talk will summarize the current knowledge on the pathophysiological mechanisms underlying disease severity and progression and the clinical utility of a few routine tests such as arterial blood gases, inflammatory biomarkers, liver function tests, cardiac and kidney biomarkers, full blood cell count and various coagulation tests, as well as the role of multi-parameter clinical risk scores in the management and risk-stratification of patients with COVID-19.

Since the introduction of vaccination programs on a global scale, routine laboratory tests are also pivotal in managing the rare cases who develop adverse side effects, such as vaccination induced thrombotic thrombocytopaenia.

Monoclonal Gammopathy of Renal Significance and Light Chain Disease

Dr Rohan Pullaperuma

Monoclonal gammopathies are a group of disorders ranging from benign monoclonal gammopathy of undetermined significance to multiple myeloma and lymphoproliferative neoplasms. Monoclonal gammopathy of renal significance (MGRS) is a relatively new entity where there is no evidence of full-blown myeloma or lymphoma but there is renal damage caused by the monoclonal protein. The diagnosis requires biopsy proven renal pathology and treat with the myeloma or lymphoma protocols to prevent the progression of renal damage which does not respond to the standard immunosuppressive treatment. The light chain deposition disease is a rare monoclonal gammopathy where monoclonal light chains are deposited in various organs causing tissue damage. It is almost always associated with renal disease and can be presented as MGRS or symptomatic myeloma or lymphoproliferative neoplasm.

DAY 2

Clinical Implications of Renal Stone Analysis

Dr Anuruddha Abeygunasekera

Although comprehensive metabolic evaluation is regarded as the gold standard for the evaluation of nephrolithiasis, it is costly, cumbersome to the patient and a tedious process. In comparison stone composition analysis is relatively easy and less costly yet may give enough information to start appropriate therapeutic measures to inhibit stone growth and stone recurrence. Therefore, all stones removed by surgery or collected after spontaneous passage are sent for stone analysis in developed countries.

Although many methods have been used for stone analysis over the years, the presently recommended method is Fourier transform infrared spectroscopy (FTIR) due to its accuracy and ease of performing.

Based on stone analysis, renal stones are divided into two main categories. Calcium stones and non-calcium stones. Non-calcium stones can be uric acid, struvite or cystine. They need no further evaluation before preventive measures. All three groups should have potassium citrate therapy and a water intake of 3 litres per day. In addition, cystine stone formers can have treatment with Thiola. Struvite stones if associated with infection may require antibiotic prophylaxis.

Patients with calcium stones should have 24-hour urinary calcium measured to identify absorptive hypercalciuria. Patients with type II absorptive hypercalciuria should receive thiazide diuretics in addition to potassium citrate and optimum water intake daily which is recommended for the rest of the calcium stone formers.

Those with calcium oxalate monohydrate and cystine stones should avoid attempts at shock wave lithotripsy (SWL) if stones recur as these stones respond poorly to SWL.

Although above algorithm looks comprehensive and clear, there are practical problems that are encountered by clinicians during real-time clinical practice. Despite whatever the category, the final recommendation for almost all groups is to drink more water and take lifelong potassium citrate. Only a handful will benefit from thiazide diuretics. Tests are expensive and life-long potassium citrate therapy is expensive and compliance is low as it has to be taken eight hourly for life and produces some unpleasant adverse effects like constipation in the majority.

ORAL PRESENTATIONS

ORAL PRESENTATIONS - CASE REPORTS

1. Misleading Intra Operative Parathyroid Hormone Monitoring
2. A Case Report of L2-hydroxyglutaric Aciduria Presenting with Learning Disability and Cerebellar Signs

Dr M.H.K. Amarasekara
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Adrenocortical Carcinoma Presenting with Hypertensive Emergency and Pseudoprecocious Puberty

Dr R.D.D.M Rajapaksha
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Registrar in Chemical Pathology
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Kandy

ORAL PRESENTATIONS - RESEARCH PAPER

Comparison of Urinary 25% Sulfosalicylic Acid Protein to Creatinine Ratio vs Pyrogallol Red Protein to Creatinine Ratio in a Group of Healthy Individuals and Optimization of the Sample Volume for the Urinary 25% Sulfosalicylic Acid Method

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Evaluation of the Immune Response to Covishield Vaccine, in a Cohort of Participants in Colombo

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Screening of PCSK9 Variant, rs11591147, with a Novel Method in a Cohort of Familial Hypercholesterolaemia Patients

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ABSTRACTS OF CASE REPORTS

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CR 02 - A Boy with Homozygous Variant of Familial Hypercholesterolaemia

CR 03 - Two Children with Late Infantile Manifestation of Multiple Sulfatase Deficiency

CR 04 - A Lady with Unsuppressed High Dose Dexamethasone Suppression Test, Normal Pituitary Imaging and Cushing Disease

CR 05 - Artefactual 25-OH Vitamin D and Paraproteinaemia

CR 06 - A Patient Presenting with Recurrent Episodes of Hypoglycaemia

CR 07 - A Patient with Chronic Pancreatitis due to Primary Hyperparathyroidism

CR 08 - A Young Woman Presenting with Secondary Amenorrhea due to Hypopituitarism Secondary to a Non - Functioning Pituitary Macroadenoma

CR 09 - Contrast Media Causing Unusual Gel Flotation During Parathyroid Venous Sampling

CR 10 - Diagnosis of Dihydropyrimidinase Enzyme Deficiency in a Sri Lankan Boy with Dihydropyrimidinuria

CR 11 - Graves Disease Associated with Autoimmune Haemolytic Anaemia – A Rare Clinical Presentation

CR 12 - Hypopituitarism as A Sequalae of Empty Sella Syndrome – A Delayed Presentation Of Sheehan Syndrome

CR 13 - Influence of CYP3A5 Polymorphism in Tacrolimus Bioavailability

CR 14 - Occult Insulinoma – The Importance of Selective Intra-Arterial Calcium Stimulation Test in Preoperative Localization

CR 15 - Ovarian Origin Hyperandrogenism in a Postmenopausal Woman with Adrenal Tumour

CR 16 - A Lady with Confusing Thyroid Function Tests

ABSTRACTS OF CASE REPORTS

CR 17 - A Case Report of L2-Hydroxyglutaric Aciduria Presenting with Learning Disability and Cerebellar Signs

CR 18 - A Case Report of Primary Amyloidosis

CR 19 - Hypercalcaemia Running in a Sri Lankan Family

CR 20 - Typical Inferior Petrosal Sinus Sampling Results in a Patient with Severe Cushing Disease

CR 21 - Adrenocortical Carcinoma Presenting with Hypertensive Emergency and Pseudoprecocious Puberty

CR 22 - Autosomal Recessive Renal Hypouricaemia Type 2 Presenting as Childhood Stroke in a Sri Lankan Child

CR 23 - Heamophagocytic Lymphohistiocytosis Secondary to Dengue Fever

CR 24 - Acute Pancreatitis Following Parathyroidectomy

CR 25 - A Lady With Persistently Elevated Anti-Thyroglobulin Antibody. Residual Cancer? Recurrence? or an Interference?

CR 26 - Incidental Finding of Heamoglobin Variants During HbA_{1c} Measurement by Capillary Electrophoresis; Is it an Advantage or a Disadvantage?

CR 27 - Beta-Ketothiolase Deficiency – A Young Boy with Severe Metabolic Acidosis

CR 28 - A Multifocal Insulinoma Presenting With Post-surgical Recurrence

CR 29 - Grossly Elevated Alkaline Phosphatase in a Pregnant Woman with Preeclampsia and Gestational Diabetes

CR 30 - Inconsistent Postmortem Thyroid Functions between Femoral Blood and Vitreous Fluid Biochemistry

CR 31 - A Neonate with Respiratory Distress, Severe Hyperammonaemia and Metabolic Acidosis: A Case Report on Propionic Acidaemia

ABSTRACTS OF CASE REPORTS

CR 01

Misleading Intra Operative Parathyroid Hormone Monitoring

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Introduction

Intra operative parathyroid hormone (PTH) monitoring (IPM) guides towards a focused parathyroidectomy in cases of primary hyperparathyroidism and reduces the risk of operative failure especially in multi glandular disease.

Case Presentation

A 17-year-old girl, presented with a three-month history of bone pain and limping. Biochemistry revealed hypercalcaemia (2.9 mmol/L), hypophosphataemia (0.5 mmol/L), elevated alkaline phosphatase (1945 U/L) and intact PTH of 1463 pg/mL (iPTH) (18.4 – 80.1) suggesting primary hyperparathyroidism. Skeletal survey revealed sub periosteal bone resorption, salt and pepper skull, brown tumour of the right tibia and generalized osteopaenia. Ultra sound and computarized tomagraphy scan of the neck were normal. Parathyroid venous sampling revealed markedly increased iPTH bilaterally, although left thyroid veins were not identified. ^{99m}Tc sestamibi scan was not performed prior to surgery, since the patient could not afford. She underwent parathyroidectomy (4 gland exploration and half gland re-implantation). Histology revealed bilateral parathyroid hyperplasia. IPM showed >50% reduction (from 1925 pg/mL to 639.2 pg/mL) indicating a surgical success. Three weeks after surgery, her iPTH was 1363 pg/mL, suggesting persistence of the disease. ^{99m}Tc sestamibi scan at this time, revealed persistent tracer retention in left thyroid lobe suggestive of a parathyroid adenoma from an ectopic gland. The patient is awaiting re-exploration.

Discussion

Possible causes for surgical failure of this patient were, inadequate pre-operative localization of the tumour and false reassurance of the surgical success by the IPM, due to the adherence of less strict interpretation criteria. To reduce the risk of unsuccessful surgery, exact pre-operative localization of the pathology, exact pre-incision baseline sampling in IPM, and adhering to stricter interpretation criteria of IPM such as >70% decline or return of final PTH to within normal range can be practised.

Keywords

Primary hyperparathyroidism, parathyroid venous sampling, intra operative parathyroid hormone assessment

ABSTRACTS OF CASE REPORTS

CR 02

A Boy with Homozygous Variant of Familial Hypercholesterolaemia

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Introduction

Homozygous familial hypercholesterolemia (HoFH) is a rare genetic disorder resulting in significantly elevated low-density lipoprotein cholesterol (LDL-C) levels. HoFH affects 1 in 1,000,000 individuals who present during early childhood with aggressive disease progression.

Case Presentation

We present a 5-year-old boy born normally to 2nd degree consanguineous parents. At the age of 4 months parents noted a skin lesion on his buttocks and gradually similar lesions developed on his elbows as well. A skin biopsy indicated xanthomatous lesions. Lipid profile was as follow: total cholesterol 1097 mg/dL (112-208), LDL cholesterol 1036 mg/dL (47.2-121) with high density lipoprotein cholesterol 44 mg/dL (36-73) and triglyceride level 84 mg/dL (44-197). Echocardiogram revealed a mild aortic regurgitation and ultrasound scan abdomen indicated grade 1 fatty liver. Familial hypercholesterolemia (FH) was confirmed by mutation analysis, where a homozygous pathogenic variant was identified in the *LDLR* gene. His 2-year-old sibling who had skin manifestations was found to carry the same mutation in homozygous state. He was started on rosuvastatin and ezetimibe. Post one month lipid profile did not show significant improvement.

Discussion

Early identification and aggressive treatment of FH in individual patients, as well as screening of all first-degree relatives is important to minimize cardiovascular disease. Treatment modalities include a combination of life style modification, lipid lowering drugs, LDL apheresis and liver transplantation. The case indicates the importance of identification of characteristic skin lesion and direction for lipid profile for early diagnosis of FH.

Keywords

Homozygous familial hypercholesterolaemia, LDL cholesterol, xanthoma, familial hypercholesterolaemia

ABSTRACTS OF CASE REPORTS

CR 03

Two Children with Late Infantile Manifestation of Multiple Sulfatase Deficiency

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Introduction

Multiple sulfatase deficiency (MSD) is an autosomal recessive lysosomal storage disorder resulting in reduced catalytic activity of all known sulfatases developed due to defective formylglycine generating enzyme (FGE) which is responsible for post-translational modification of sulfatases. This results in accumulation of sulfate esters in cellular lysosomes giving classic clinical features. Mutation in sulfatase modifying factor 1 gene *(SUMF1)* causes reduced function or instability of FGE, which contributes to clinical phenotype of this disorder as neonatal, late infantile and juvenile forms.

Case Presentation

A 4-year-old girl, a product of non-consanguineous parents found to have developmental delay followed by developmental regression started at the age of 3 years. She had macrocephaly, coarse facial features, hypertrichosis, ichthyosis, dystonic posture, pectus carinatum and hepatomegaly. Her MRI brain showed macrocephaly, ventriculomegaly with brain atrophy and bilateral white matter changes suggesting mucopolysaccharidosis type 1 or 2. Furthermore, she had very low levels of sulfatases and molecular analysis confirmed a homozygous pathogenic variant in the *SUMF1* gene c.1033C>T which was missense pathogenic (class 1). The second case was a 4-year-9-month old boy, product of non-consanguineous parents, found to have developmental delay followed by developmental regression started at 18 months of age. He had coarse facial features, dysostosis multiplex and hepatomegaly where he was clinically diagnosed as mucoplysaccharidosis. Biochemical analysis showed very low levels of sulfatases and genetically confirmed by two combined heterozygous likely pathogenic variants in *SUMF1* gene which were c.1A>G start-lost likely pathogenic (class2) variant and c.514C>T nonsense likely pathogenic (class2) variant. Both patients were found to have high total cholesterol levels ranging from 5.5-6.6 mmol/L with normal triglycerides which was a novel finding.

Discussion

The diagnosis of MSD should be considered in children presenting with developmental delay, developmental regression, coarse facial features, hepatomegaly with skin changes. Incidental finding of high total cholesterol level should be further investigated.

Keywords

Multiple sulfatase deficiency, SUMF1 gene, mucopolysaccharidosis, coarse facial features, developmental regression

ABSTRACTS OF CASE REPORTS

CR 04

A Lady with Unsuppressed High Dose Dexamethasone Suppression Test, Normal Pituitary Imaging and Cushing Disease

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Introduction

Cushing disease is a condition where hypercortisolaemia is due to adrenocorticotropic hormone (ACTH) producing pituitary tumor. ACTH stimulates adrenal glands to produce stress hormone cortisol. We report a case of a pituitary Cushing disease with normal magnetic resonance imaging (MRI) findings.

Case Presentation

A 55-year-old woman presented with progressive weight gain for 6 months. She also had increasing fatigability, easy bruising, proximal muscle weakness, polyuria, polydipsia and nocturia. Examination revealed a moon face, truncal obesity, dorsal fat pad and fine bruises over the abdomen and arms. Overnight dexamethasone suppression, (ODST) low dose dexamethasone suppression test, (LDDST) and high dose dexamethasone suppression test (HDDST) showed unsuppressed cortisol levels. Plasma ACTH level was 117 pg/mL (7–41). She had diabetes but no hypokalaemia or metabolic alkalosis. Imaging of pituitary, chest and abdomen were normal.

Inferior petrosal sinus sampling (IPSS) confirmed an ACTH producing pituitary source. Transsphenoidal hypophysectomy was performed and the histology suggested a pituitary adenoma. The patients' general well-being and proximal myopathy improved after the surgery.

Discussion

As Cushing disease is a rare condition, diagnosis may be difficult at times. Results of IPSS helped to diagnose ACTH producing focus, probably microadenoma was not detected by imaging. Though HDDST was not suggestive, other findings were suggestive of Cushing disease. This case illustrates the value of IPSS when other findings were negative for Cushing disease.

Keywords

Cushing disease, inferior petrosal sinus sampling, imaging studies

ABSTRACTS OF CASE REPORTS

CR 05

Artefactual 25-OH Vitamin D and Paraproteinaemia

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Introduction

The commonly used analytical method to measure vitamin D is automated immunoassay, which is known to be affected by interferences, especially from immunoglobulins present in the patient's serum. We present a case of a patient with hyperparaproteinaemia in whom interference with the vitamin D assay was identified.

Case Presentation

A 73-year-old male presented with feeling unwell, tiredness, shortness of breath and malaise to haematology unit. He was known to have IgM paraproteinaemia diagnosed as monoclonal gammopathy of undetermined significance (MGUS) since 2005. His blood test revealed 25-OH Vitamin D >400 nmol/L (measured by ARCHITECT chemiluminescent microparticle immunoassay), normal adjusted calcium, phosphate, elevated parathyroid hormone (PTH) and normal renal functions. The paraprotein concentration was 21 g/L and full blood count was unremarkable. He did not demonstrate signs of vitamin D toxicity and no history of recent vitamin D replacement or any other multivitamin supplements. The vitamin D levels using Mass Spectrometry (LC-MS/MS) was 20 nmol/L (D2 <5 mmol/L, D3 20 nmol/L). This suggested that he was in fact vitamin D deficient and some of his symptoms were secondary to vitamin D deficiency. He was commenced on vitamin D replacement as per protocol. He is under review by haematology team for MGUS at present.

Discussion

25- OH Vitamin D immunoassay by Abbott Architect has showed interference to paraproteinaemia. Factitious results due to assay interference can lead to unnecessary investigations, treatment or can mask certain other clinical diagnosis. When there is discordance between laboratory data and clinical clues, close collaboration with the laboratory is crucial to perform analysis with alternative methods and evaluate for analytical interference.

Keywords

25-OH vitamin D, analytical interference, immunoassay, paraproteins

ABSTRACTS OF CASE REPORTS

CR 06

A Patient Presenting with Recurrent Episodes of Hypoglycaemia

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Introduction

All patients presenting with a history of hypoglycaemia in whom the "Whipple triad" is seen should be assessed thoroughly for its underlying cause and managed accordingly. Multiple endocrine neoplasia - 1 (MEN-1) is associated primarily with tumours occurring in the parathyroid gland, pancreatic islet cells and the anterior pituitary gland, but some patients will also present with carcinoid tumours, adrenal tumours, meningiomas, collagenomas, facial angiofibromas and lipomas. MEN-1 disease is inherited as an autosomal dominant disease or can occur sporadically.

Case Presentation

A 28-year-old man presented with a history of an episodic hypoglycaemia for 2 months and was found to have increased serum insulin, C peptide, parathyroid hormone, prolactin with low follicular stimulating hormone, luteinizing hormone and testosterone. Imaging studies revealed a microadenoma in the pituitary, two focal areas of enhancement in the pancreas and hyperplasia of the parathyroid glands suggesting a diagnosis of MEN-1 disease. Genetic studies indicated a heterozygous, likely pathogenic MEN -1 variant with recommendations for testing his clinically affected relatives. He was started on cabergoline and intra-muscular testosterone. Selective arterial calcium stimulation test was done to localize the insulinoma. Following localization, near total pancreatectomy, splenectomy, cholecystectomy and hepatico- jejunostomy were performed. As his father too was diagnosed with MEN-1 disease, extended family screening was planned in all members.

Discussion

MEN -1 patients need multidisciplinary team management, including physicians, surgeons, endocrinologists, radiologists, chemical pathologists, histopathologists, gastroenterologists and clinical geneticists. Lifelong treatment and monitoring are of utmost importance in preventing further complications in all patients.

Keywords

Hypoglycaemia, multiple endocrine neoplasia - 1 disease

ABSTRACTS OF CASE REPORTS

CR 07

A Patient with Chronic Pancreatitis due to Primary Hyperparathyroidism

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Introduction

Hyperparathyroidsm is a common endocrine disease. Chronic pancreatitis is a consequence of hypercalcemia seen in hyperparathyroidism. Here we present a case of a middle-aged woman who was diagnosed with chronic pancreatitis due to hyperparathyroidism.

Case Presentation

A 41-year-old woman was admitted with recurrent abdominal pain radiating to back and relieved by bending forward. She had albumin corrected calcium of 15.2 mg/dL (8.6-10.2), phosphate of 1.2 mg/dL (2.5-4.6), alkaline phosphatase of 170 U/L (40-150) and 25 hydroxy cholecalciferol of 5.88 ng/mL (30-100). Her parathyroid hormone (PTH) was 454.5 pg/mL (18-80). She was diagnosed to have chronic pancreatitis by the clinical history, evidenced by imaging together with amylase of 198 U/L (<100 U/L). Ultrasound scan of the neck revealed a well-defined lesion in the lower pole of the left thyroid and contrast enhanced computed tomography of neck revealed findings suggestive of a thyroid nodule rather than a parathyroid adenoma. Cytology from the nodule revealed cells of parathyroid origin with hyperplastic/neoplastic change. Moreover, the fluid obtained from fine needle aspiration cytology (FNAC) needle wash had a PTH of 99.1 pg/mL which was conclusive of fluid from parathyroid origin. Selective parathyroid venous sampling revealed localized lesion in the left inferior thyroid gland. Left inferior parathyroidectomy was carried out. Her intra-operative PTH at 10 minutes post-operative was 27.8 pg/mL. Postoperative calcium declined to 9.6 mg/dL. She is being continuously followed up by surgical and endocrinology teams with biochemical monitoring.

Discussion

Most common biochemical abnormality of primary hyperparathyroidism is hypercalcaemia. Whenever a patient is encountered with hypercalcaemia a prompt work-up should be carried out for the early diagnosis of hyperparathyroidism and to prevent complications involving multiple organ systems. FNAC needle wash and selective parathyroid venous sampling help to confirm the diagnosis and localize the lesion when imaging is inconclusive.

Keywords

Primary hyperparathyroidsm, parathyroid venous sampling

ABSTRACTS OF CASE REPORTS

CR 08

A Young Woman Presenting with Secondary Amenorrhoea due to Hypopituitarism Secondary to a Non-functioning Pituitary Macroadenoma

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Introduction

Hypopituitarism is a rare endocrine disorder, characterized by deficiency of one or more hormones secreted by the pituitary gland. Most frequent presentation is menstrual abnormalities due to deficiency of follicular stimulating hormone and luteinizing hormone. Non-functioning pituitary macroadenoma (NFPA) may lead to hypopituitarism due its compressive effect on the pituitary stalk and the gland.

Case Presentation

An 18-year-old woman presented with a history of secondary amenorrhea for 8 years duration. She had her menarche at the age of 10 years. She had headache, polydipsia and polyuria for 3 years. On examination she had breast development at Tanner stage 2, scanty pubic and axillary hair and normal external genitalia. There were no signs of virilization or hirsutism. Biochemical investigations revealed serum osmolality and serum sodium near upper normal limits and inappropriately low urine osmolality. Short synacthen test followed by long synacthen test and water deprivation test revealed secondary adrenocortical insufficiency and central diabetes insipidus. Hormonal tests revealed hypogonadotropic hypogonadism with FSH 0.59 IU/L (1.9 - 12.5), LH 0.06 IU/L (2.5 - 10.2), estradiol 38 pmol/L (77 - 921), secondary hypothyroidism, mild hyperprolactinaemia, low 9 am serum cortisol and low insulin like growth factor I. Ultrasound scan of the abdomen revealed small uterus with small ovaries and magnetic resonance imaging of brain revealed a large mass lesion within the sellar region extending to compress optic chiasma. She underwent pituitary surgery and started on hormonal replacement therapy. Histopathological investigations confirmed the presence of NFPA.

Discussion

Hypopituitarism associates with higher mortality and morbidity, thus, early diagnosis and treatment is mandatory. A patient with secondary amenorrhoea should be investigated promptly with regard to hypothalamic - pituitary - ovarian axis following exclusion of pregnancy. Measurement of gonadotropins, thyroid stimulating hormone, prolactin and cortisol are key elements in rule in the cause of secondary amenorrhoea.

Keywords

Secondary amenorrhoea, hypopituitarism, non - functioning pituitary macroadenoma

ABSTRACTS OF CASE REPORTS

CR 09

Contrast Media Causing Unusual Gel Flotation During Parathyroid Venous Sampling

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Introduction

Administration of a contrast agent via the catheter to visualize the proper position of the catheter is essential during the parathyroid venous sampling (PVS) procedure.

Case presentation

A 47-year-old female with persistently elevated parathyroid hormone levels after four gland parathyroidectomy for tertiary hyperparathyroidism due to end stage renal failure was admitted for PVS in order to localize the remaining parathyroid tissue. A venogram was performed to confirm the catheter's position with 2 mL of Iopamidol 300 mg/mL. Samples were collected with a syringe connected to a hydrophilic coated catheter by low-pressure aspiration, from 19 collection sites out of 26 sites according to the protocol. Blood was immediately transferred from syringe to plain tubes with gel separator. All tubes were centrifuged at 2200 x g for 10 minutes. Primary blood tubes containing blood from the middle portion of the left internal jugular vein and from the left middle thyroid vein exhibited an abnormal flotation of gel separator while tubes from rest of the sites showed the standard gel separator barrier, after centrifugation. Therefore, those two samples needed manual handling to remove serum through the gel layer. The records of the procedure confirmed that the cannulation was difficult as a result of the parathyroidectomy done about three months back, which needed frequent injections of the iodinated contrast media (Iopamidol), with 1.349 g/cm^3 of density.

Discussion

The unusual flotation of the gel layer can be justified by the high concentration of the iodinated contrast media in those two samples. We recommend that a blood volume similar to twice the catheter extension needs to be discarded to dilute the residual contrast media before collection of samples for laboratory assays. In addition, introducing plain-tubes (without gel separator) for PVS is a practical solution in order to avoid pre-analytical nonconformities.

Keywords

Parathyroid venous sampling, contrast media, gel tubes

ABSTRACTS OF CASE REPORTS

CR 10

Diagnosis of Dihydropyrimidinase Enzyme Deficiency in a Sri Lankan Boy with Dihydropyrimidinuria

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Introduction

Dihydropyrimidinase (DHP) deficiency is a rare autosomal recessive inborn error of pyrimidine metabolism, due to the mutation of DPSY gene, leading to accumulation of pyrimidine degradation products in urine, blood and cerebrospinal fluid (CSF). The disease is characterized by dihydropyrimidinuria. DHP enzyme catalyzes the second step in the pyrimidine degradation pathway. It is also involved in the degradation of widely used antineoplastic fluoropyrimidine drugs such as 5-flourouracil and its prodrug capecitabine. Patients with DHP deficiency have variable clinical phenotypes ranging from asymptomatic to severe neurological dysfunction.

Case presentation

A 2-week-old male neonate born to healthy consanguineous Sri Lankan parents, was investigated for frequent apnoeic episodes, feeding problems and hypotonia. Magnetic Resonance Imaging (MRI) of the brain revealed left sided middle cerebral artery infarction. The characteristic dihydropyrimidinuria was evident by the presence of dihydrouracil along with thymine and uracil in urine organic acid analysis which strongly suggested DHP deficiency. The genetic diagnosis of DHP deficiency was made by the mutational analysis and homozygous pathogenic variant c.1010T >C p. (Leu33Pro) was identified in the *DPSY* gene. Currently, the patient is 1-year-old and he is having gross motor delay.

Discussion

Clinical presentation of pyrimidine metabolism disorders such as DHP deficiency can be nonspecific, and the diagnosis may be difficult without urine organic acid analysis done in acute stage. Identification of this disorder is useful because toxicities related to chemotherapeutic drugs such as fluoropyrimidine can be prevented even in asymptomatic individuals with DHP deficiency.

Keywords

Dihydropyrimidinase, dihydropyrimidinuria, *DPSY* gene

ABSTRACTS OF CASE REPORTS

CR 11

Graves Disease Associated with Autoimmune Haemolytic Anaemia – A Rare Clinical Presentation

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Introduction

Graves disease (GD) is an autoimmune disorder which results in overproduction of thyroid hormones and diffuse enlargement of thyroid gland due to the binding of IgG auto antibodies with thyroid stimulating hormone (TSH) receptors on thyroid follicular cells. Although anaemia is a common feature of GD, the association of autoimmune haemolytic anaemia (AIHA) is rarely seen.

Case Presentation

A 33-year-old female presented with symptoms of anaemia, excessive sweating and fine tremors for 3 weeks duration. She had been suffering from joint pain and loss of weight for one year duration. On examination, she was found to be severely pale and icteric. A diffuse, palpable enlargement of thyroid gland was identified. There were no signs of thyroid eye disease or pretibial myxoedema. The investigations revealed the presence of anaemia with a haemoglobin level of 3.9 g/dL, unconjugated hyperbilirubinaemia, increased lactate dehydrogenase level and a high reticulocyte count. The features of blood picture were suggestive of AIHA and the positive direct anti-globulin test for anti IgG and anti C3d confirmed it. The thyroid profile showed a very low TSH value of 0.05 mIU/L (0.465 – 4.68) with high free T_4 and free T_3 values. Both anti-thyroid peroxidase [94.5 IU/mL (< 5.61)] and anti-thyroglobulin antibody levels [176.66 IU/mL (< 4.11)] were markedly elevated. The increased TSH receptor antibody level [15.5 U/L (<0.4)], which is the confirmatory biochemical test of GD established the diagnosis of GD complicated with AIHA. The treatment with carbimazole, beta blockers and prednisolone improved her condition.

Discussion

The autoimmune processes in GD usually cause anaemia due to pernicious anaemia and coeliac disease. The association of AIHA with GD is rarely seen. This case emphasizes the importance of screening for Graves disease in patients with AIHA and vice-versa due to the presence of a rare association between those diseases.

Keywords

Graves disease, autoimmune haemolytic anaemia

ABSTRACTS OF CASE REPORTS

CR 12

Hypopituitarism as A Sequalae of Empty Sella Syndrome – A Delayed Presentation of Sheehan Syndrome

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Introduction

The herniation of sub-arachnoid space into sella causing flattening of pituitary gland is defined as empty sella syndrome (ESS). Sheehan syndrome (SS), the necrosis of pituitary gland due to infarction or ischaemia following postpartum hemorrhage (PPH) is a known cause for ESS. It can present as hypopituitarism either acutely or in a delayed manner.

Case presentation

A 45-year-old female presented with myalgia, lethargy and dyspeptic symptoms for 6 months duration. She had developed secondary amenorrhoea, lactation failure and loss of pubic/axillary hair one year following her uncomplicated second childbirth at the age of 27 years and the clinic follow-up was defaulted. The investigations showed hyponatraemia and anaemia. A low normal thyroid-stimulating hormone (TSH) value of 1.0 mIU/L (0.465 – 4.68) with a low free T_4 value of 2.3 pmol/L (10 – 28.2) was indicative of secondary hypothyroidism. Further evaluation revealed a low growth hormone level of < 0.08 µg/L (2 – 5) and insulin like growth factor level of 48 ng/mL (124 – 290). A low cortisol [10 nmol/L (138 – 635)] and adrenocorticotropic hormone level [8 pg/mL (7 – 41)] were identified. Her serum gonadotropin levels were well below the reference range and estradiol level was in post-menopausal range. Hence, the diagnosis of hypopituitarism was established. The MRI scan of brain confirmed the presence of empty sella. According to her classic clinical presentation, ESS was probably secondary to SS. The symptoms got improved following hormone replacement therapy.

Discussion

SS can also occur due to extremely low blood pressure or vascular spasms during childbirth even without a history of PPH. However, it is important to exclude mimics of SS like hypophysitis and adenoma due to the delayed presentation. This also emphasizes the importance of performing both TSH and free T_4 specifically when suspecting secondary hypothyroidism.

Keywords

Hypopituitarism, empty sella syndrome, Sheehan syndrome

ABSTRACTS OF CASE REPORTS

CR 13

Influence of CYP3A5 Polymorphism in Tacrolimus Bioavailability

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Introduction

Tacrolimus is a calcineurin-calmodulin inhibitor, widely used as an immunosuppressant following solid organ transplantation. It takes a place in therapeutic drug monitoring because of its narrow therapeutic index. The drug is metabolised by enzymes in CYP3A subfamily of cytochrome P450 superfamily in the liver.

Case Presentation

A 22-year-old girl with end-stage renal disease due to autosomal dominant adult polycystic kidney disease underwent a related, live donor renal transplant. She was started on tacrolimus 6 mg per day. It was a weight adjusted dose of 0.15 mg/kg and the target trough concentration (C_0) of tacrolimus is 8–10 ng/mL during the first month of post-kidney transplant.

First C_0 tacrolimus was done at post-op day 3 and it was sub-therapeutic (6.7 ng/dL). Her haematocrit, total serum proteins and serum albumin were within normal range. Tacrolimus dose was gradually increased and C_0 tacrolimus was monitored weekly. Ultimately, she had to be prescribed twice the usual weight adjusted dose to achieve the target trough level.

Her serum creatinine was stable and within the range. She was suspected to be a CYP3A5 expresser and genetic mutational studies confirmed as she was an intermediate metabolizer with the genotype of CYP3A5 *1/*3.

Discussion

Single nucleotide polymorphism (SNP) in the genes CYP3A5 and CYP3A4 influences in the metabolism and bioavailability of tacrolimus in turn in the effective blood concentration. Depending on the number of alleles affected, it is characterised as extensive, intermediate and poor metabolizers. If we had known that a patient carries the mutation, 1.5 to 2-fold of the usual dose could have been started. It would enable to avoid low exposure of tacrolimus in the immediate post-transplant period. If the assay is in control, following the exclusion of a random error, it is wise suggesting to exclude CYP3A5 polymorphism.

Keywords

Tacrolimus, cytochrome P_{450}, CYP3A4, CYP3A5

ABSTRACTS OF CASE REPORTS

CR 14

Occult Insulinoma – The Importance of Selective Intra-arterial Calcium Stimulation Test in Preoperative Localization

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Introduction

Insulinoma is a functional neuroendocrine tumour of pancreas which causes hyper-secretion of insulin. It is the commonest cause of hypoglycaemia in a healthy individual when there is no evidence of factitious hypoglycaemia. Occult insulinoma is a biochemically proven tumour with inability to determine the anatomical site prior to surgery. Selective intra-arterial calcium stimulation test (SIACS) has ≥94% sensitivity in preoperative localization of an occult insulinoma.

Case Presentation

A 46-year-old male presented with episodes of faintishness for 7 months duration. It was associated with autonomic symptoms and exacerbated with fasting. His fasting plasma glucose level was 63 mg/dL (74–100). The 72-hour prolonged fasting test which is the gold standard in biochemical diagnosis of endogenous hyperinsulinaemia indicated a positive result with an increased serum insulin level of 185.01 pmol/L (<18) and C-peptide level of 0.86 nmol/L (<0.2) when having adequate hypoglycaemia (53 mg/dL). As non-invasive radiological findings were negative, an endoscopy guided ultrasound scan of pancreas was performed. It revealed a focal lesion (0.9 x 0.9 cm) in the head of the pancreas which was in consistent with typical features of an insulinoma. Therefore, it was followed by a SIACS test and it showed a two-fold rise in insulin level from the baseline following stimulation of gastro duodenal artery. It confirmed the presence of an insulinoma in the head of the pancreas. As he refused undergoing surgical intervention, he has been being followed up with blood glucose monitoring and frequent diet therapy.

Discussion

In SIACS test, the intra-arterially given calcium stimulates secretion of insulin only from the abnormally hyper-functioning beta cells of pancreas. Hence, it is useful in preoperative localization of an occult insulinoma, identifying multiple lesions and further confirmation of identified focal lesions. This case also emphasizes the importance of considering insulinoma as a differential diagnosis in a healthy individual with symptoms of hypoglycaemia.

Keywords

Occult insulinoma, selective intra-arterial calcium stimulation test

ABSTRACTS OF CASE REPORTS

CR 15

Ovarian Origin Hyperandrogenism in a Postmenopausal Woman with Adrenal Tumour

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Introduction

New onset hyperandrogenism in a postmenopausal woman is very rare. It is usually caused by ovarian hyperthecosis or androgen secreting tumours of the ovary or adrenal.

Case presentation

A 63-year-old obese patient with hypertension was investigated for abdominal pain. On examination she was found to have a body mas index (BMI) of 35.2 kg/m^2, recent onset hirsutism and acne. She had a total testosterone of 314 ng/dL (14 - 76), aldosterone:renin ratio of 16.6 (ng/dL) / (ng/ml/hr) (<30) and oestradiol of 233 pmol/L (<102). Contrast-enhanced computed tomography (CECT) abdomen done on admission revealed a right sided adrenal tumour, cholecystitis with multiple gallbladder calculi and normal ovaries. She underwent a laparoscopic cholecystectomy and open adrenalectomy and histology of adrenal gland revealed adrenal cortical adenoma. After surgery, her testosterone levels on two occasions remained elevated at 345 and 517 ng/dL and hyperandrogenic features persisted. Dexamethasone 0.5 mg 6 hourly for 48 hours caused 44% suppression of testosterone from 811 ng/dL to 461 ng/dL. The source of testosterone secretion was localized to the right ovary by a combined adrenal and ovarian venous sampling. Patient was referred to a gynaecologist and is awaiting bilateral oophorectomy.

Discussion

Imaging findings can mislead the clinician in defining source of excess androgens. Combined adrenal and ovarian venous sampling should be considered to locate the source of hyperandrogenism even in postmenopausal women.

Keywords

Hyperandrogenism, adrenal cortical adenoma, combined adrenal and ovarian venous sampling

ABSTRACTS OF CASE REPORTS

CR 16

A Lady with Confusing Thyroid Function Tests

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Introduction

Thyroid function tests are affected by analytical factors leading to physician confusion upon interpreting. Interfering factors vary within and between individuals in life time.

Case Presentation

A 47-year-old woman with diagnosed autoimmune thyroiditis, was referred due to persistently low TSH despite normal FT_4, adequate therapy and compliance. Other pituitary hormones were normal.

TFT was repeated in three platforms suspecting assay interference. Siemens ADVIA Centaur XP system reported TSH <0.008 mIU/L (0.55-4.78) and FT_4 14.80 pmol/L (11.5-22.7). The manual immuno-radiometric assay (IRMA) and an Abbott Architect i1000 system reported TSH 4.44 mIU/L (0.71-4.05) with FT_4 of 14.15 pmol/L (11.45-22.65) and TSH of 2.55 mIU/L (0.35-4.94) with FT_4 of 10.79 pmol/L (9-19) respectively.

As biotin supplements were excluded and antibody blocking tubes were not available, it was concluded as heterophile antibody interference for Advia TSH assay, and the patient was continued to be treated as primary hypothyroidism. Referring clinician was advised to monitor her with FT_4 with a system other than ADVIA Centaur.

Discussion

TSH assays are designed with two antibodies against the α and the β subunits of the TSH molecule. Negative interferences are possible with heterophile antibodies, biotin and streptavidin antibodies. Even though her history of autoimmune thyroiditis is suggestive of heterophile antibody interference, recent study revealed a variant of TSH β subunit (R55G), common among South Asian population is responsible for negative interfere with the TSH assay. It is reported that all Siemens TSH assays are unable to detect this mutated TSH β (R55G) subunit as it does not bind the monoclonal assay antibodies and reported very low TSH levels. To confirm the condition, genetic testing which is not freely available is needed. We believe that it is important to be aware this fact when interpreting confusing TFT results, which are especially assayed with Siemens systems in Sri Lankans.

Keywords

Thyroid stimulating hormone, free thyroxine, heterophile antibody, assay interference, thyroid stimulating hormone β mutation

ABSTRACTS OF CASE REPORTS

CR 17

A Case Report of L2-hydroxyglutaric Aciduria Presenting with Learning Disability and Cerebellar Signs

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Introduction

L2-hydroxyglutaric aciduria (L2HGA) is a slowly progressive, autosomal recessive rare neurometabolic disorder due to mutations in *L2HGDH* gene, coding for the mitochondrial enzyme L2-hydroxyglutarate dehydrogenase (L2HGDH). Deficiency of L2HGDH enzyme leads to accumulation of L2-hydroxyglutaric acid in cells causing a leukoencephalopathy predominantly affecting the cerebellum. L2HGA presents with psychomotor retardation, macrocephaly, bilateral cerebellar involvement, behavioral disorders, seizures, pyramidal and extra pyramidal signs. The disease is first described by Duran et al. Up to now only 300 cases reported worldwide.

Case presentation

A baby boy, born to a third-degree consanguineous parentage, with two healthy siblings, had a normal birth and development up to 2 years of age. At 3 years of age, he presented with macrocephaly, poor pre-school performance, inattention and behavioural disorder. At 12 years of age, he was found to have bilateral cerebellar signs and tonic extensor spasms in all four limbs.

Urine organic acid analysis by gas chromatography-mass spectrometry (GCMS) showed a massive peak of 2-hydroxyglutaric acid. Mutation analysis revealed two heterozygous pathogenic variants in *L2HGDH* gene in exon 3, c.293A>G (p.His98arg) and exon 7, c. 829c>T (p.Arg277*) confirming the genetic diagnosis of autosomal recessive L2HGA. Child was started on therapy with riboflavin, levocarnitine and co-enzyme Q. However, his condition remains static over the past two years.

Discussion

To our knowledge, this is the first case of L2HGA presented in Sri Lanka. Riboflavin, a flavin adenine dinucleotide (FAD) precursor activates the L2HGDH enzyme reducing the neurotoxicity of L2HGA. However, this child did not respond to riboflavin therapy. In a child presenting with macrocephaly, learning disability with associated neurological involvement, urine organic acid analysis by GCMS is paramount in ruling out rare metabolic causes such as L2HGA.

Keywords

L2-hydroxyglutaric aciduria, gas chromatography mass spectrometry

ABSTRACTS OF CASE REPORTS

CR 18

A Case Report of Primary Amyloidosis

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Introduction

Amyloidosis is a rare disease that occurs when an abnormally formed protein, called amyloid, gets deposited in organs and interferes with their normal function. There are several subtypes of amyloidosis depending on structure of amyloid protein. Primary amyloidosis known as AL amyloidosis (amyloid light chain), is the most common type. It commonly affects the heart, kidney, liver and nerves. We report a case of primary amyloidosis with cardiac symptoms.

Case Presentation

A 47-year-old woman presented with shortness of breath and facial puffiness. She had periorbital swelling and cervical lymphadenopathy on examination. Her liver and renal functions were normal. Blood picture revealed normocytic normochromic anaemia and bone marrow biopsy revealed that bone marrow is not infiltrated by amyloid and there is no definite evidence of multiple myeloma infiltrating the bone marrow. Her serum and urine protein electrophoresis showed normal pattern but serum and urine immunofixation electrophoresis revealed monoclonal lambda chains. Serum free lambda light chains were high at 1173 mg/L. Her cervical lymph node biopsy was positive for amyloid deposition. High levels of high sensitivity troponin T (26.36 ng/L) and BNP (167.30 pg/mL) were observed. The 2D ECHO suggested of cardiac amyloidosis. A diagnosis of primary amyloidosis was made, and symptoms were managed. Now the patient is waiting for chemotherapy.

Discussion

Amyloidosis is difficult to diagnose due to nonspecific early clinical manifestations. This case consisted of primary amyloidosis with involvement of the heart as initial presentation of the disease and diagnosed by serum and urine immunofixation and serum free light chain assay. Ultimate goal of treatment of AL amyloidosis is eradication of monoclonal plasma cells in bone marrow with chemotherapy and prevention of production of pathological immunoglobulin light chains.

Keywords

Amyloid, primary amyloidosis, electrophoresis, lambda chains

ABSTRACTS OF CASE REPORTS

CR 19

Hypercalcaemia Running in a Sri Lankan Family

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Introduction

Familial hypocalciuric hypercalcaemia (FHH) is an autosomal dominant disease that occurs due to an inactivating mutation in the calcium-sensing receptor (CaSR). It is a rare but important cause of hypercalcaemia. Differentiating from primary hyperparathyroidism is (PHPT) crucial to avoid unnecessary intervention that can make more harm than good.

Case Presentation

A 38-year-old male presented with polyuria, polydipsia, nausea and hypertension (140/95 mmHg). His ionized calcium was 1.37 mmol/L (1.0-1.32), serum phosphate was 0.8 mmol/L (0.8-1.5) with a plasma PTH of 7.53 pmol/L (1.5-7.2) and the vitamin D level was normal. Differential diagnoses were PHPT and FHH. Low 24-hour calcium excretion of 0.7 mmol/day (2.5-7.5 mmol/day) and urine calcium:creatinine ratio of 0.002 was diagnostic of FHH. His thyroid function tests, renal function tests, plasma aldosterone and renin activity, and urine total metanephrines were normal excluding secondary causes for hypertension. On screening, family members also had mild hypercalcaemia and low urinary calcium excretion in an autosomal dominant fashion. Whole-exome sequencing revealed only insignificant variance related to the *HMPBD* gene.

Discussion

Biochemical features of FHH and PHPT overlap extensively. Both have high/inappropriately normal PTH, low phosphate, high calcium:phosphate ratio, high urinary phosphate excretion, increased urinary cAMP levels which are indicators of high PTH activity. Urine calcium:creatinine ratio of <0.01 is diagnostic of FHH as opposed to >0.015 in PHPT. Mutations in CaSR are usually in exons. Intronic mutations and epigenetics alterations which can suppress receptor activity were not evaluated in this patient. Hypercalcaemia by its effects on vascular constriction can lead to hypertension which is more common among patients with PHPT. However, few cases of hypertension associated with FHH have been reported in the literature. FHH does not require treatment, and responds poorly to parathyroidectomy. Regular follow up with serum calcium and reassuring the affected family members may avoid unnecessary and expensive investigations.

Keywords

Hypercalcaemia, familial hypocalciuric hypercalcaemia, primary hyperparathyroidism

ABSTRACTS OF CASE REPORTS

CR 20

Typical Inferior Petrosal Sinus Sampling Results in a Patient with Severe Cushing Disease

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Introduction

Cushing syndrome is caused by presence of excessive endogenous or exogenous glucocorticoids in blood. Cushing syndrome due to endogenous glucocorticoids 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, and ectopic corticotropin-releasing hormone (CRH) syndrome. Here we report a patient with severe Cushing disease.

Case Presentation

A 24-year-old man, with poorly controlled diabetes and resistant hypertension of recent onset, was referred for evaluation of proximal muscle weakness and hyperpigmentation. Initial investigations revealed hypokalaemia and metabolic alkalosis. Overnight and low-dose dexamethasone suppression tests were suggestive of Cushing syndrome. ACTH was 263 pg/mL (7-63) and high-dose dexamethasone suppression test showed suppressed cortisol confirming Cushing disease. Furthermore, he had hyperprolactinaemia and secondary hypothyroidism for which he was medically optimized. Pituitary magnetic resonance imaging revealed left sided pituitary microadenoma. Non-stimulated bilateral inferior petrosal sinus sampling (IPSS) was carried out to exclude ectopic ACTH syndrome, and to localize and lateralize the pituitary tumour. A diagnosis of Cushing disease due to left sided ACTH-secreting pituitary microadenoma was made. Patient underwent transsphenoidal resection of pituitary tumour and the histology was compatible with a pituitary adenoma. The patient was normoglycaemic and normotensive following surgery and was started on oral hydrocortisone. The patient is being followed up for adequacy of hydrocotisone, and recurrence of Cushing disease.

Discussion

The differentiation between Cushing disease and ectopic ACTH secretion is a diagnostic dilemma requiring combined evaluation by biochemical tests and imaging, none of which has 100% diagnostic accuracy. IPSS is considered the gold standard for confirming the source of ACTH secretion and localizing a pituitary tumor. This case report illustrates the usefulness of IPSS for above purpose.

Keywords

Cushing disease, inferior petrosal sinus sampling

ABSTRACTS OF CASE REPORTS

CR 21

Adrenocortical Carcinoma Presenting with Hypertensive Emergency and Pseudoprecocious Puberty

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Introduction

Adrenal cortical carcinoma (ACC) is an ultra-rare disease with bimodal incidence occurring below 5 years and 4th and 5th decades. Although most of ACC are sporadic, some are associated with hereditary syndrome. ACC can present as functional (hormone secreting) and nonfunctional tumours.

Case Presentation

A 10-year-old boy suddenly developed seizures as a complication of severe hypertension. His appearance has been changed over 3 months with development of facial acne, weight gain, deepening of voice. Examination revealed secondary sexual characteristics (axillary hair, pubic hair, and post pubertal penile length with prepubertal testicular volume and left sided abdominal mass. Routine investigations were unremarkable. Hormone profile revealed ACTH independent hypercortisolism which was suggestive of cortisol secreting adrenal tumor. Androgen axis showed high testosterone with suppressed gonadotropins indicating pseudoprecocious puberty which was clinically evident with post pubertal penile length with pre pubertal testicular volume. Elevated DHEA-s (>40.17 µmol/L) indicate excess androgen is adrenal in origin. Aldosterone:renin ratio showed hyperreninaemic hyperaldosteronism (secondary hyperaldosteronism may be either due to renal artery stenosis due to mass effect of tumour or autonomous renin secretion as a part of paraneoplastic syndrome).

Contrast enhanced computed tomography of abdomen demonstrated heterogeneously enhancing left supra renal mass causing mild renal parenchymal compression. Left adrenalectomy was performed after lowering the cortisol burden with fluconazole therapy which was assessed by cortisol day curve with pre and post fluconazole regime. Histology revealed malignant ACC with peritoneal deposits. Undetectable post-surgical serum cortisol level indicated suppressed contralateral pituitary-adrenal axis. Patient was started on intravenous hydrocortisone and referred for chemotherapy.

Discussion

Considering the rarity and complexity of ACC, multidisciplinary approach is important in early diagnosis. Adrenal hormonal evaluation plays a major role in path of diagnosis and further management. Genetic screening is important to identify familial cancer syndrome.

Keywords

Adrenal cortical carcinoma, pseudoprecocious puberty

ABSTRACTS OF CASE REPORTS

CR 22

Autosomal Recessive Renal Hypouricaemia Type 2 Presenting as Childhood Stroke in a Sri Lankan Child

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Introduction

Hereditary renal hypouricaemia (HRH) is due to isolated defects in renal urate transporters causing hyperuricosuria resulting hypouricaemia. Defects in urate transporter 1 causes HRH type I(HRHI) and glucose transporter 9 coded by *SLC2A9* (Solute Carrier Family 2 Member 9) gene causing HRH type 2(HRH2). Most are asymptomatic but can present with nephrolithiasis, acute kidney injury or posterior reversible encephalopathy syndrome.

Case Presentation

A previously healthy 14-year-old girl presented with sudden onset right sided body weakness, unsteady gait, and slurred speech. She was normotensive. MRI brain revealed a left parietal lobe infarction. Quantitatively and morphologically normal red blood cells and platelets were seen with hypersegmented neutrophils. Renal functions, plasma glucose and lipid profile were within normal intervals. The infection, coagulation and lupus anticoagulant screen were unremarkable. 2D echocardiogram and carotid duplex were non-distinctive. The magnetic resonance angiography brain revealed a vascular narrowing querying a focal vasculitis. Serum B_{12}, folate and plasma homocysteine levels were normal. A heterozygous C>T (MTHFR 677 C>T) mutation of the *MTHFR* (methylenetetrahydrofolate reductase) gene noted, was considered benign by itself.

Low serum uric acid (UA) of 26 µmol/L (119 - 327) was incidentally detected in the general biochemistry screening in the laboratory. Urine uric acid: creatinine was 0.33 mmol/mmol (0.2 - 0.4) and fractional excretion of UA was 268 % (6 - 20 %). HRH was suspected and mutational analysis revealed a homozygous c.646G>A p.(Gly216Arg) mutation in SLC2A9 gene and HRH2 confirmed.

Discussion

Oxidative stress plays a key role in cerebrovascular disease and UA as an electron donor is a prominent low-molecular-mass antioxidant in the body. Thus, severe hypouricaemia is associated with endothelial dysfunction and has been documented in HRH1. The more severe hypouricaemia in HRH2 is considered the etiology of the ischemic stroke in the patient. This is the first reported case to our knowledge with HRH2 presenting as an ischaemic stroke suggesting a varied presentation of the disease.

Keywords

Hypouricaemia, hereditary renal hypouricaemia type 2, ischaemic stroke

ABSTRACTS OF CASE REPORTS

CR 23

Heamophagocytic Lymphohistiocytosis Secondary to Dengue Fever

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Introduction

Heamophagocytic lymphohistiocytosis (HLH) is a rare fatal hyperinflammatory syndrome that can be familial or acquired. Familial form is an autosomal recessive disorder which commonly affects the young, whereas acquired form occurs secondary to infections, connective tissue disorders and malignancies. Viral infections are frequently encountered. We report a case of HLH, rhabdomyolysis and severe viral hepatitis secondary to dengue fever.

Case Presentation

A 42-year-old previously healthy woman presented with 5 days history of fever associated with arthralgia, myalgia and retro orbital headache. Examination revealed pallor, jaundice, hypotension and tender hepatomegaly.

Anaemia and thrombocytopaenia were evident in complete blood count. Dengue virology was positive for both IgM and IgG antibodies. Despite treatment, she developed severe generalized myalgia and heamaturia. Further evaluation revealed high serum ferritin 169 035 ng/mL (10 - 291), LDH 5178 U/L (<145), triglyceride 212 mg/dL (<150) and low plasma fibrinogen 162 mg/dL (220 - 469) levels. Diagnosis of HLH was confirmed by a bone marrow biopsy. Patient was started with IV dexamethasone and immunoglobulin. The liver profile was suggestive of severe acute hepatitis with markedly elevated liver transaminases AST 11449 U/L (13-31), ALT 1855 U/L (5-35) and direct hyperbilirubinemia 94.4 µmol/L (<5) and was managed with N-acetylcysteine (NAC) infusion.

Co- existing rhabdomyolysis was diagnosed by elevated creatine kinase 130 054 U/L (<145) and presence of myoglobinuria. However, renal functions remained normal and alkaline diuresis was not needed.

Discussion

Severe inflammation in HLH characterized by uncontrolled proliferation morphologically benign lymphocytes and macrophages that secrete high amount of inflammatory cytokines. Our patient fulfilled 5 criteria out of 8 according to the HLH- 2004 histiocytic protocol. However, pathology behind rhabdomyolysis, associated with dengue fever itself or secondary to HLH is inconclusive. It is important to identify the atypical manifestations of dengue fever in order to initiate appropriate management to prevent fatal outcomes. Routine investigations will direct clinicians to further evaluation.

Keywords

Heamophagocytic histiocytosis, rhabdomyolysis

ABSTRACTS OF CASE REPORTS

CR 24

Acute Pancreatitis Following Parathyroidectomy

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Introduction

Acute pancreatitis secondary to hyperparathyroidism is common preoperatively. However, occurrence of pancreatitis following parathyroidectomy is very rare. We report a case of acute pancreatitis following parathyroidectomy.

Case Presentation

A 50-year-old man presented with fever, dysuria and loin pain for 2 weeks. His urine examination revealed a pyuria while ultrasound scan of the abdomen showed bilateral renal and ureteric calculi with nephrocalcinosis. A diagnosis of acute pyelonephritis secondary to bilateral nephrocalcinosis was made.

He had serum ionized calcium of 1.84 mmol/L (1.1-1.4), parathyroid hormone (iPTH) of 54.3 pmol/L (1.59-7.21), alkaline phosphatase of 304 IU/L (96-279) and 25–OH vitamin D of 38.6 nmol/L (50-75) and phosphate of 2.3 mg/dL (2.5-5.0). Technetium (Tc99m) sestamibi scan and CT scan of neck revealed a parathyroid adenoma and an ectopic parathyroid adenoma on left side. Following parathyroidectomy, on 4th post-operative day, he developed severe epigastric pain with a serum amylase level of 1897 U/L (22 - 80) and a high serum calcium level. Acute pancreatitis following parathyroidectomy was diagnosed and high dependency unit care was given with close monitoring for complications. He was discharged on oral vitamin D 2000 IU daily dose with a plan to undergo ureteroscopy and JJ stenting for nephrocalcinosis and ureteric stones.

Discussion

Acute pancreatitis is a life-threatening incident following parathyroidectomy. Having very high serum calcium and iPTH levels in preoperative period aid in predicting the occurrence of post-operative acute pancreatitis.

Keywords

Acute pancreatitis, parathyroidectomy

ABSTRACTS OF CASE REPORTS

CR 25

A Lady with Persistently Elevated Anti-thyroglobulin Antibody. Residual Cancer? Recurrence? or an Interference?

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Introduction

The thyroglobulin (Tg) is a glycoprotein produced by the thyroid follicles in both benign and malignant states. The thyroglobulin antibody (TgAb) is produced by lymphocytes within the thyroid in 10%-20% of thyroid cancer patients. Resolution of TgAb occurs following total thyroidectomy and persistently elevated TgAb level leads to the suspicion of residual cancer, recurrence or an interference in TgAb measurement.

Case Presentation

A 30-year-old lady presented with a lump in the neck, loss of weight and hoarseness of the voice for 3 months. Following investigations, she was diagnosed with non-metastatic papillary thyroid cancer and underwent total thyroidectomy. Her TgAb level was >5000 IU/L (5-100) with Tg <0.2 µg/L (<3) immediately following surgery. She was referred to the Department of Chemical Pathologyt 8 months after surgery due to persistently elevated TgAb levels to exclude a laboratory error. The possibility of residual cancer and recurrence of the disease had been excluded following whole body 131I scan. The TgAb was measured by chemiluminescence immunoassay which uses polyclonal antibody. Following exclusion of preanalytical and post analytical errors, an interference testing was carried out with serial dilution testing and measurement in different platforms by radioimmunoassay and chemiluminescence immunoassay which use monoclonal antibody which revealed an antibody interference to the TgAb assay was least likely.

Discussion

TgAb in thyroid cancer patients resolves after treatment at a rate of approximately 11% per month from the initial level in a time dependent manner. Thus, persistently elevated levels after total thyroidectomy would not always be due to residual cancer, recurrence or a laboratory error. However, an interference should always be suspected if the results do not fit the clinical picture. Although the current standard of care is to measure Tg and TgAb postoperatively, a preoperative measurement would help in identifying TgAb positive patients and establish a time course for postoperative TgAb resolution.

Keywords

Thyroid cancer, interference testing, thyroglobulin antibody resolution

ABSTRACTS OF CASE REPORTS

CR 26

Incidental Finding of Heamoglobin Variants During HbA_{1c} Measurement by Capillary Electrophoresis; Is It an Advantage or a Disadvantage?

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Introduction

Haemoglobin (Hb) Villejuif was first described in 1989 in an 87-year-old french woman suffering from coincidental polycythaemia vera. It is a silent and asymptomatic variant and only two case reports have been published so far.

Case Presentation

A 73-year-old patient of an Italian origin presented with a confusional state as a result of diabetic ketoacidosis aggravated by a Methicillin-resistant *Staphylococcus aureus* infection over the left heel and coliform positive urinary tract infection. While the patient was being investigated, her HbA_{1C} results were not generated by the capillary electrophoresis on two occasions due to atypical profile of the electrophorogram. (Bifurcations were noted in both HbA_0 and A_{1c} peaks) Therefore, her blood was tested for fructosamine. [The value was 340 µmol/L (200 – 290)]. Except thrombocytosis, neutrophil leucocytosis (related to infections) and low serum iron with low transferrin saturation, her other haematological investigations were normal. The variant detected during testing for HbA_{1c} is not detected on thalassaemia screen. There was an elevated P2 peak (HbA_{1c}) on HPLC of 8.7%. Bi-directional DNA sequencing of beta globin chain detected heterozygous Hb variant, Hb Villejuif [β123 (H1) Thr → Ile, c.371 C>T in exon 3] producing the third case of this Hb variant.

Discussion

Capillary electrophoresis is more sensitive in the separation of haemoglobin peaks compared to the HPLC method with regard to HbA_{1c} measurement. Therefore, it is quite usual that the abnormal Hb variant could be found with capillary electrophoresis. Further investigations on the abnormal peaks found with capillary electrophoresis are really important when those variants are associated with haematological abnormalities and abnormalities in oxygen binding properties of haemoglobin. In chemical pathology point of view, when there is no result generated by the capillary electrophoresis for HbA_{1c}, fructosamine level or glycated albumin level (more preferred way) can be measured as an alternative option for HbA_{1c}.

Keywords

Capillary electrophoresis, fructosamine, Hb Villejuif

ABSTRACTS OF CASE REPORTS

CR 27

Beta-ketothiolase Deficiency – A Young Boy with Severe Metabolic Acidosis

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Introduction

Beta-ketothiolase (β-KT) or acetyl-CoA acetyltransferase 1 (ACAT1) is an important enzyme involved in isoleucine catabolism, hepatic ketone body synthesis and extrahepatic ketolysis. β-KT deficiency leads to accumulation of 2-methylacetoacetyl-CoA, 2-methyl-3-hydroxybutyryl-CoA and tiglyl-CoA. Urinary metabolites of these help as biomarkers in the diagnosis of β-KT deficiency. Enzyme activity measurement and genetic studies support the confirmation of β-KT deficiency.

Case Presentation

A 2-year-old previously healthy boy was admitted to paediatric intensive care unit with progressive drowsiness and respiratory distress following 2 days history of fever, vomiting and reduced oral intake. He is the third born child to second degree consanguineous parents having two elder healthy siblings. Other than mild speech delay growth and development were appropriate for his age.

On examination child was drowsy, tachycardic and had Kussmaul breathing. Arterial blood gas analysis revealed marked high anion gap metabolic acidosis. Other serum biochemical and haematological investigations remained normal, arising the suspicion of metabolic acidopathy. Urine organic acid analysis by gas chromatography mass spectrometry (GCMS) revealed very high level of 2-methyl-3-hydroxybutyrate, moderate amount of 2-methylacetoacetate and tiglylglycine which are the typical biomarkers of β-KT deficiency. Dried blood spot analysis for acylcarnitine by tandem mass spectrometry revealed elevated tiglylcarnitine and 3-hydroxyisovalerylcarnitine (C5-OH), confirming the diagnosis of β-KT deficiency. Homozygous likely pathogenic variant in *ACAT1* gene [ACAT1, c.152C>T p. (Pro51Leu)] was identified during PCR sequencing. Acute ketoacidosis markedly improved with intravenous fluid. Prevention of acute ketosis is the mainstay of management.

Discussion

Early suspicion of metabolic disease and timely collection of samples for special investigations are crucial to arrive at a diagnosis and proper management of children with high anion gap metabolic acidosis.

Keywords

High anion gap metabolic acidosis, beta-ketothiolase deficiency

ABSTRACTS OF CASE REPORTS

CR 28

A Multifocal Insulinoma Presenting with Post-surgical Recurrence

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Introduction

Solitary, sporadic benign insulinomas commonly cause hyperinsulinaemic hypoglycaemia. They are rare neuroendocrine tumours with an incidence of 4 per million population per year. Despite the benign nature of insulinomas, when multifocal (insulinomatosis), they have a high rate of recurrence.

Case Presentation

A 30-year-old divorced woman with three children was referred to the psychiatric unit to evaluate episodic fainting attacks with depressive symptoms worsening for 3-months. Her recurrent fainting attacks fulfilled Whipple's triad and complained of significant weight gain (10 kg). Her basic investigations were within normal limits except for low fasting plasma glucose [2.61 mmol/L (3.3 - 5.6)]. An endogenous organic hyperinsulinaemia was confirmed by elevated fasting insulin [(1287 pmol/L (<174)] and C-peptide [1.42 nmol/L (0.26 - 1.03)] with increased amended insulin-to-glucose ratio (1170 pmol/mmol; >53.6). She was subjected to partial resection of the pancreatic tumour upon radiological localisation of a neoplastic lesion (11 x 10 mm) at the pancreatic head but presented with recurrence of symptoms 3-weeks after surgery. Post-surgical selective intraarterial calcium stimulation test (SIACST) revealed residual autonomous insulin secretion from the preserved pancreatic body area.

Discussion

As surgical excision of the tumour is usually curative in the absence of metastasis, accurate localisation of the tumour is of paramount importance in the management. Insulinomas are functional tumours, small in size at the presentation, making their localisation by imaging a challenge. The main pitfall observed in the management of this patient was the sole dependence on conventional imaging for the localisation of a functional tumour, which led to pre-operative misdiagnosis of a multifocal insulinoma (insulinomatosis) as a solitary tumour, resulting in suboptimal surgical resection. This case highlights the importance of invasive venous sampling in the localisation of functional tumours such as insulinoma and detrimental outcomes in sole dependence on imaging to localise functional tumours.

Keywords

Invasive venous sampling, functional tumuors, insulinoma, hypoglycaemia

ABSTRACTS OF CASE REPORTS

CR 29

Grossly Elevated Alkaline Phosphatase in a Pregnant Woman with Preeclampsia and Gestational Diabetes

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Introduction

Alkaline phosphatase (ALP) is a ubiquitous membrane-bound ectoenzyme with several isoforms present in liver, bone, intestine, and placenta. Liver isoform mainly contributes to the serum ALP activity in a healthy adult. During pregnancy, ALP gradually increases, owing to the placental ALP isoenzyme that typically mounts to 2-3 times its pregestational value, rendering it less useful as a hepatobiliary indicator in pregnant women.

Case Presentation

A 29-year-old mother of one child with gestational diabetes was admitted to obstetrics unit to induce labour at 40-weeks of gestation. She had a blood pressure of 140/100 mmHg on admission prompting, screening for preeclampsia. Her initial investigations were within normal limits except for the grossly elevated ALP [2125 IU/L (38 - 229)], while other liver and bone parameters were found to be normal. The fractionated ALP analysis based on heat-stability revealed a 93% residual ALP activity following the incubation of serum at 60^0C for 30 minutes, indicating significant contribution by heat-stable placental isoenzyme to serum ALP activity (2125x0.93 = 1979 IU/L). She had an uncomplicated vaginal delivery of a healthy baby with no postnatal complications. The mother's ALP level was serially monitored and noted to fall gradually during the postpartum period, which reached normal limits for non-pregnant women within 10-weeks (79 IU/L).

Discussion

About 3% of women develop a liver disease during pregnancy (hyperemesis gravidarum to eclampsia or acute fatty liver). Therefore, it is essential to differentiate between benign and pathological causes of liver enzyme derangements in cases with gross ALP elevation. Hypotheses suggest a correlation of elevated ALP to large-for-gestational-age, preterm delivery, gestational diabetes, preeclampsia, and possible placental insufficiency. However, the impact of marked elevation of placental ALP on the overall pregnancy outcome remains elusive. Thus, active identification of extreme elevation of placental ALP and close monitoring of fetomaternal sequalae can unmask the underlying pathologies not yet well understood.

Keywords

Alkaline phosphatase, isoenzymes, enzyme heat stability, placental insufficiency

ABSTRACTS OF CASE REPORTS

CR 30

Inconsistent Postmortem Thyroid Functions between Femoral Blood and Vitreous Fluid Biochemistry

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Introduction

Postmortem biochemistry can provide important information in determining the cause of death (COD). Out of postmortem specimens, vitreous fluid is ideal for postmortem biochemical analysis, as it is relatively isolated and less affected by postmortem changes (redistribution, haemoconcentration). However, equilibration of some analytes between blood and vitreous fluid can be affected by its anatomical location, as observed in this case, where postmortem femoral blood and vitreous fluid thyroid functions were used to conjecture premortem thyroid status of the patient in the absence of premortem values.

Case Presentation

A 28-year-old pregnant woman admitted at 26-weeks of gestation due to tachypnoea and palpitations for 3-days. She had tachycardia (200 bpm), with supraventricular-tachycardia on electrocardiogram, and poor left-ventricular function on echocardiography. She underwent an emergency hysterotomy to terminate her pregnancy but suffered a sudden death 6-hours after surgery. During the postmortem to ascertain her COD, vitreous biochemistry revealed a hyperthyroid picture with suppressed TSH and elevated free-T_3 [TSH: 0.108 mIU/L (0.465 - 4.68), free-T_4: 13.22 pmol/L (10 - 28.2), free-T_3: 12.74 pmol/L (4.26 - 8.1)], while femoral blood had a euthyroid picture [TSH: 1.32 mIU/L, free-T_4: 13.3 pmol/L, free-T_3: 4.54 pmol/L]. Postmortem thyroid histology showed detached follicular-epithelial-cells (autolytic changes), excluding autoimmune thyroiditis causing hyperthyroidism thus supraventricular-tachycardia as the COD. Her COD was confirmed as acute on chronic myocarditis by postmortem cardiac histology.

Discussion

Based on the clinical presentation, hyperthyroidism was a differential diagnosis in this case leading to postmortem thyroid investigations. T_3-toxicosis on vitreous biochemistry was confounding with detached follicular-epithelial-cells mimicking lymphocytes, misleading towards autoimmune thyroiditis. Differences in thyroid hormone transportation between compartments explain the inconsistency of thyroid status between femoral blood and vitreous fluid. This case highlights the need to interpret postmortem biochemistry cautiously and arrive at conclusions with a holistic approach. Due to the lack of literature on the correlation of postmortem to premortem biochemistry, the postmortem specimen type best representative of premortem thyroid function requires further research.

Keywords

Postmortem biochemistry, vitreous fluid analysis, thyroid functions

ABSTRACTS OF CASE REPORTS

CR 31

A Neonate with Respiratory Distress, Severe Hyperammonaemia and Metabolic Acidosis: A Case Report on Propionic Acidaemia

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Introduction

Propionic Acidaemia (PA) is a rare autosomal recessive disorder of propionic acid metabolism caused by *PCCA, PCCB* gene mutation. Defect in the conversion of propionyl-CoA to methylmalonyl-CoA by propionyl-CoA carboxylase interferes normal metabolism of branched-chain amino acids, odd-chain fatty acids, thiamin, and uracil. Most patients present in the early neonatal period with severe high-anion-gap metabolic acidosis and hyperammonaemia with multisystem complications.

Case Presentation

An 18-day-old baby boy born at term without antenatal/ immediate postnatal complications was admitted due to severe respiratory distress. He only had poor feeding on day-3 and was discharged following assessment of the adequacy of breastfeeding. He had no family history of any metabolic disorders. At 18 days, the baby developed lethargy, hypotonia, poor sucking, vomiting, refusal to feed, convulsions and rectal bleeding and was transferred for ventilator support. On examination, he was pale, dyspnoeic and hypotonic. His investigations revealed pancytopaenia, hypocalcaemia [1.81 mmol/L (2.2-2.7)], elevated C-reactive protein [342 mg /dL (<5)], high anion gap metabolic acidosis [pH 7.12 (7.35-7.45), HCO_3- 10.7 mmol/L (23-33)] and hyperammonaemia [1688 µmol/L (40-80)]. His plasma amino acid profile had non-specific changes while urine organic acid analysis revealed elevated 3-hydroxy propionic acid and propionyl glycine, confirming propionic acidaemia diagnosis. Despite medical treatment, the baby expired on day-24 due to severe metabolic acidosis and sepsis.

Discussion

PA is often precipitated by protein intake, as observed in the index patient who developed symptoms after breastfeeding. Prompt treatment of hyperammonaemia and acidosis is imperative to prevent neurologic damage and potentially fatal outcome. In the absence of response of hyperammonaemia and acidosis to conventional treatment as observed in the index patient, peritoneal dialysis is the treatment of choice for detoxification. This case highlights the importance of performing urine organic acids in patients presenting with high-anion-gap metabolic acidosis not to miss the diagnosis of possible organic acidosis.

Keywords

Propionic acidaemia, hyperammonemia, metabolic acidosis

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ABSTRACTS OF RESEARCH PAPERS

RP 01

An Audit on Uncollected Chemical Pathology Laboratory Reports at Colombo North Teaching Hospital and the Assessment of Resulting Financial Wastage

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Introduction

Receiving of an issued test report by the requesting clinician with a minimal turnaround time is also as important as the content in the report to minimize the post analytical errors. It was observed that a large number of reports issued by the chemical pathology laboratory were accumulated in reports dispatching counter without being collected by the patients. With the aim of establishing laboratory information management system (LIMS), this audit assessed the types of analytes, requesting clinic of uncollected reports by the patients and the resulting financial wastage.

Methods

A retrospective study was carried out and included all the uncollected chemical pathology laboratory reports that remained at the report dispatching counter in Colombo North Teaching Hospital during the time period from 01/06/2020 to 31/08/2020. The analytical reagent cost per test and printing cost were considered when calculating financial wastage.

Results

There were 2308 uncollected chemical pathology reports. Out of those reports, 1740 (75.39 %) were general biochemistry assays and 568 (24.61%) were hormone assays. According to the total number of tests performed by the laboratory during that period, 5.2 % of hormone assays and 0.6 % of general biochemistry assays were not collected by the patients. Thyroid profile accounted for 82.64 % of uncollected hormone assays and serum creatinine was the majority (21.08%) of uncollected general biochemistry assays. Most of the uncollected reports (17.35%) were requested by medical clinics. The calculated financial wastage for the uncollected chemical pathology reports was Rs. 762,923.76.

Conclusions

Hormone assays represented the highest percentage of uncollected reports when compared with total number of assays performed by the laboratory. Thyroid profile showed the highest contribution to uncollected hormone assays. There was a considerable amount of financial wastage. The establishment of LIMS will be able to minimize this financial wastage and to improve the turnaround time which will assist clinicians to make decisions without any delay.

Keywords

Uncollected laboratory reports, financial wastage

ABSTRACTS OF RESEARCH PAPERS

RP 02

A Study on the Impact of Time and Temperature Variations on the Analysis of Urine for Selected Parameters

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Introduction

Urinalysis is one of the valuable tests for diagnosis and monitoring of patients suspected of urinary tract disorders. According to the CLSI GP16A3 guidelines, the recommended analysis time for urine is within 2 hours of collection. However, various factors including transportation of samples to laboratories cause delays in urine analysis impacting final results. This research aimed to assess effects of time and temperature variations on urinalysis.

Methods

An experimental, cross-sectional study was performed using 50 urine samples of patients who attended Teaching Hospital, Karapitiya. Patient request forms were used to collect data regarding patient information, sample collection and sample receiving time. Collected urine samples were divided in to nine aliquots. Macroscopic, microscopic and biochemical parameters of urine were studied at different times and temperatures. Urine aliquots stored at room temperature (25-37 ^{0}C) and refrigerator (2-8 ^{0}C) were separately analyzed soon after the collection and after 3, 6, 24 and 48-hour intervals. ANOVA with repeated measures were used to analyse the data.

Results

Macroscopic appearance changed in 24 hours and 48 hours in refrigerated and room temperature stored samples ($P < 0.05$). Pus cell and epithelial cell numbers reduced after 6 hours at room temperature and refrigerator. Leucocyte concentration also reduced with time. In refrigerator stored samples the reduction was significant ($P < 0.05$). Ketone, glucose concentration and urine crystals positivity were not changed ($P > 0.05$). Red blood cells (RBC) were present in room temperature stored samples at 3–6 hours, but were not observed when refrigerated.

Conclusions

Macroscopic appearance, pus cells count, leucocyte concentration and epithelial cell count analysis are not appropriate after 6 hours of collection of urine either kept at room temperature or at (2 - 8 ^{0}C). However, ketones, glucose and urine crystals could be reported up to 48-hour storage in the refrigerator or at room temperature. RBC count can be measured only up to 6 hours in room temperature samples and cannot be measured in refrigerated samples.

Keywords

Urine, microscopic appearance, macroscopic appearance, urine analysis

ABSTRACTS OF RESEARCH PAPERS

RP 03

An Audit to Assess Reception of Unnecessary Requisitions for Measurement of Free Triiodothyronine (FT_3) by Medical Research Institute, Colombo

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Introduction

"Thyroid profile" is a frequently requested panel of investigations, despite the fact that triiodothyronine (T_3) measurement is mainly relevant in the presence of decreased level of thyroid stimulating hormone (TSH) with normal thyroxine (T_4) level, where T_3 toxicosis is the possible diagnosis. FT_3, which is analyzed using competitive immunoassay technique is a costly investigation, thus irrational use of this test unnecessarily adds on to the healthcare burden of the country. With the aim of individualizing the use of thyroid function tests depending on the actual requirement of the patient, we conducted an audit to assess the number of requests received by the biochemistry laboratory, Medical Research Institute (MRI), Colombo during the months of February and March 2021 for thyroid function tests.

Study design

Details of all the thyroid function tests performed from 1st to 28th of February 2021 were obtained from the requisition forms and database of the laboratory information system and were analysed using SPSS 23.

Results

Total of 1144 samples were analyzed for thyroid function tests during the study period. One thousand and eighty nine (95.3%) were from 27 different hospitals around the country, 21 (1.8%) samples with private requisitions and 34 (3.0%) samples of MRI staff members. Majority were for TSH and FT_4 (44.4%). Two hundred and seventy-seven (24.2%) requests were for TSH, FT_4 and FT_3 out of which 169 (60.8%) had no documented history, 8.3% were for diagnosed hypothyroidism, 7.6% for suspected hypothyroidism, 3.2% were for goiter, 3.2% thyroidectomy follow up, 15.1% for non-specific symptoms and only 5 (1.8%) were for hyperthyroidism.

Out of adult patient samples (n = 752), 31.3% were analysed for FT_3. 72.5% of them had normal TSH levels (0.35 - 4.94 mIU/L), 16.9% had low TSH levels and 10.6% had elevated TSH levels.

Conclusions

Over 80% of requisitions received for FT_3 are requested without proper indication.

Keywords

Thyroid function tests, free T_3, requests

ABSTRACTS OF RESEARCH PAPERS

RP 04

Comparison of Flame Photometry and Pyruvate Kinase Enzymatic Method for Quantification of Serum Potassium on Patients Admitted to Medical Wards at Teaching Hospital, Jaffna

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Introduction

Potassium is a major intracellular cation present in the human body and accurate measurement is clinically important as it associates with cardiac, renal diseases, adrenal cortex disorders and diabetes. Flame photometry is a lead reference method for measuring serum electrolytes. Inconvenience in utilizing flame photometry in routine laboratories has taken to the development of easily adaptable enzymatic method. This study was aimed to compare pyruvate kinase enzymatic method (EZ) with flame photometry (FP).

Methods

Hospital based descriptive cross-sectional study was conducted on 65 blood samples collected from patients whose serum electrolytes were sent for routine testing from medical wards, Teaching Hospital, Jaffna. Haemolysed samples were rejected as it is known to cause falsely increased potassium concentrations. Serum samples were used and analysis by both methods were done on the same day. Descriptive statistics like mean, standard deviation with inferential statistics of Pearson correlation coefficient and paired sample t-test were performed using SPSS version 23.

Results

Among the values obtained by FP, 21.5% were hypokalaemic (<3.5 mmol/L), 63.1% were normokalaemic (3.5 - 5 mmol/L) and 15.4% were hyperkalaemic (>5 mmol/L), whereas 20.0% were hypokalaemic, 64.6% were normokalaemic and 15.4% were hyperkalaemic by EZ method. Mean (± SD) of serum potassium by EZ and FP were 4.19 ± 0.88 mmol/L and 4.12 ± 0.78 mmol/L respectively. Mean difference between EZ and FP was 0.06 mmol/L (P = 0.224), which was not statistically significant (P >0.05). Positive linear relationship with r^2 of 0.771 and good correlation between two methods were observed (r = 0.878, P <0.001, n = 65).

Conclusions

Good degree of agreement was observed by comparing both methods and this study concluded that, EZ method can be used as a substitute for FP in routine laboratories. Further studies with larger samples will be useful to confirm the findings.

Keywords

Serum potassium, pyruvate kinase enzymatic method, flame photometer

ABSTRACTS OF RESEARCH PAPERS

RP 05

Correlation Among Serum Uric Acid and Estimated Glomerular Filtration Rate in Type 2 Diabetes Mellitus (DM) Patients Attending the Diabetic Center, Teaching Hospital, Jaffna

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Introduction

Diabetic nephropathy (DN) is a progressive kidney disease caused by the damage to glomerular capillaries. Uric acid can serve as an inflammatory factor and is an important player in the pathogenesis of microvascular complications in diabetes mellitus. Hyperuricaemia is a predictor of renal dysfunction in type 2 diabets mellitus (DM). The aim of the study was to evaluate the correlation among serum uric acid and estimated glomerular filtration rate (eGFR) in type 2 DM patients.

Methods

A total 80 patients with DM were included. Serum uric acid (enzymatic method) and serum creatinine (Jaffe alkaline picric acid method) were estimated. The eGFR was calculated by using CKD-EPI equation.

Results

Among the total, 60% were males and 40% were females. The mean of serum uric acid was 5.01 mg/dL (SD ± 2.04) and mean eGFR was 78.94 ml/min/ 1.73 m^2 (SD ± 21.55). Correlation between serum uric acid level and eGFR was observed as r = -0.698, (P <0.001), n = 80 with moderate linearity of r^2 = 0.487.

Conclusions

The moderate correlation between serum uric acid level and eGFR was observed. Further studies with large samples are needed to consider the uric acid as a predictor.

Keywords

eGFR, diabetic nephropathy, chronic kidney disease

ABSTRACTS OF RESEARCH PAPERS

RP 06

Correlation between Glycated Haemoglobin and Serum Fructosamine and Calculation of Glycation Gap based on Serum Fructosamine

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Introduction

Glycated haemoglobin (HbA_{1c}) is a widely accepted standard method for determining long term glycaemic control. Serum fructosamine (FA) has been suggested as a cost effective alternative glycaemic marker for HbA_{1c}. Glycation gap (G-gap) is the deviation between intracellular and extracellular glycation and is calculated by deduction of predicted HbA_{1c} by FA from actual HbA_{1c}. Diabetic mellitus and HbA_{1c} show ethnic/ racial disparities thus, our knowledge will be more valuable to Sri Lankans. Therefore, study was designed to determine the relationship between HbA_{1c} and serum FA and to calculate the G-gap in diabetic patients.

Methods

A hospital based descriptive cross-sectional study was carried out on 45 diabetic patients attending Diabetic Center, Teaching Hospital Jaffna. Systematic sampling method was used and patients with known haematological disorders, pregnancy, renal failure, chronic liver cell disease, recent blood transfusion and on vitamins or iron supplementation were excluded. HbA_{1c} and serum FA were measured by Turbidimetric inhibition immunoassay and nitro blue tetra chloride methods respectively. Data were statistically analyzed by Pearson correlation coefficient test and descriptive statistics such as mean and median were calculated.

Results

Among 45 diabetic patients 53.33% were females and 46.66% were males. The mean and standard deviation (SD) of serum FA and HbA_{1c} were 366.34 ± 109.36 µmol/L and 8.06 ± 1.53% respectively. HbA_{1c} levels were significantly increased with the increase in both serum FA (Pearsons correlation coefficient (r) = 0.773, $P < 0.01$, $r^2 = 0.63$ and albumin corrected FA ($r = 0.800$, $P < 0.01$, $r^2 = 0.64$). Furthermore, G-gap showed moderate positive correlation with HbA_{1c} ($r = 0.703$, $P < 0.01$, $r^2 = 0.49$).

Conclusions

Serum FA positively correlates with HbA_{1c} and albumin correction for FA improves correlation with HbA_{1c}. G-gap shows positive correlation with HbA_{1c}. However, further studies including different ethnic groups in large population from different geographic areas are required for application of FA in clinical practice.

Keywords

Glycated haemoglobin, fructosamine, glycation-gap

ABSTRACTS OF RESEARCH PAPERS

RP 07

Correlation between Serum Magnesium and Glycated Haemoglobin Levels in Type 2 Diabetic Patients Who are Attending Diabetic Centre, Teaching Hospital, Jaffna

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Introduction
Determination of glycated haemoglobin (HbA_{1c}) values provides more significant information regarding diabetic control. Magnesium has a major role in improving insulin sensitivity and preventing diabetes and its cardiovascular complications. Hypomagnesaemia leads to reduced insulin sensitivity and it occurs exponentially with duration of disease. Aim of the study was to find the correlation between serum magnesium and HbA_{1c} levels in type 2 diabetes mellitus (DM).

Methods
This was a laboratory based experimental study. Systematic sample collection method was used for sample collection. Serum magnesium was estimated by Calmagite method. HbA_{1c} and haemoglobin were measured by turbidimetric inhibition immunoassay and modification of alkaline hematin reaction, respectively. Pearson correlation coefficient was used to assess the correlation between serum magnesium and HbA_{1c} levels. Ethical clearance was obtained from Ethics Review Committee.

Results
Out of 41 type 2 DM (aged 20-79 years), 18 (43.90%) were males and 23 (56.09%) were females. Mean (± SD) age was 56.08 (± 11.78). Mean (± SD) value of serum magnesium and HbA_{1c} were 1.838 (± 0.368) mg/dL and 7.837% (± 1.092), respectively. Twenty four percent had hypomagnesaemia and 90% of them had moderate or poor glycaemic control. There was no significant correlation between serum magnesium and HbA_{1c} levels in type 2 DM patients ($r = -0.052$, $P = 0.747$] but, there was a significant negative correlation between serum magnesium level and the age ($r = -0.394$, $P = 0.011$).

Conclusions
Normal magnesium levels were observed in majority of patients and there was no significant correlation between serum magnesium and HbA_{1c} levels in type 2 DM patients.

Keywords
Glycated haemoglobin, type 2 diabetes mellitus, serum magnesium

ABSTRACTS OF RESEARCH PAPERS

RP 08

An Audit on Serum Protein Electrophoresis Done in DGH Matara in 2019 and 2020

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Introduction

Serum protein electrophoresis (SPE) is an electrophoretic method of separating proteins in serum to different fractions based on their molecular weight and electric charges. Electrophoreses is used to detect monoclonal bands. Aim of this study was to find out the patterns of monoclonal bands in serum protein electrophoresis done in the chemical pathology laboratory of the hospital.

Methods

All SPE tests done in DGH Matara during 2019 and 2020 were included in the study. Repeated tests were excluded. SPE was done by capillary electrophoresis using SEBIA mini cap analyzer. Monoclonal bands were confirmed by immuno-fixation. Excel data base was prepared using patients' clinical details and relevant laboratory investigations.

Results

A total of 349 patients aged between 17 and 92 years had undergone SPE during this period. Out of them 115 (33%) were males and 234 (67%) were females. Nearly one third of them were from general medicine unit. Others were from surgical, rheumatology, orthopaedic, neurology, oncology and other units at descending order of 18%, 16%, 10%, 6%, 6% and 4% respectively. Rest (9%) was from outstations.

Among requests, majority (73%) had hypoalbuminaemia. One third of patients (31%) revealed hypergammaglobulinaemia while 11% showed hypogammaglobulinaemia. Eighty two (23%) patients had abnormal bands and 62 (76%) of them were in gamma region and 20 (26%) were in atypical regions (α1,α2, β1and β2). Out of patients with abnormal bands in the gamma region, 48 (77%) had monoclonal bands and 28 (58%) of them were females while 20 (42%) were males. Thirty-two (67%) had a paraprotein concentration of >5 g/L and 16 (33%) had < 5 g/L.

Conclusions

Majority of patients referred for SPE were females and most requests were made by general medical units. About 14% had monoclonal bands in gamma region while 6% had abnormal bands in atypical regions which needed confirmation by immuno-fixation electrophoresis.

Keywords

Serum protein electrophoresis, immuno-fixation electrophoresis, monoclonal bands

ABSTRACTS OF RESEARCH PAPERS

RP 09

Determination of Postoperative Hypocalcaemia in Patients Undergoing Total Thyroidectomy by Using Single Measurement of Pre-Closure Plasma Intact Parathyroid Hormone Level

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Introduction

Hypocalcaemia is a common complication after total thyroidectomy and produces potentially severe symptoms. Other problems associated are anxiety in patients who are affected and prolongation of hospital stay. Hence, the quality of life of the patient is negatively affected because of the need for long term medication, clinic follow ups and significant cost on treatments. This study has evaluated the reliability of predicting post-operative hypocalcaemia by using single measurement of pre-closure plasma intact parathyroid hormone level (PC-iPTH) in patients undergoing total thyroidectomy.

Methods

It was a hospital and laboratory based prospective, analytical cross sectional study conducted including 63 patients, who underwent total thyroidectomy at the surgical unit of Base Hospital, Avissawella. A consecutive sampling method was used. Plasma iPTH (measured by non-competitive chemiluminescence immunoassay, DiaSorin, Liaison), eGFR, serum albumin corrected total calcium (SACTC) and magnesium were analyzed on the day before the surgery. Symptoms of hypocalcaemia were assessed and SACTC was measured post-operative day 1 (postop-D1). Data were analyzed using MiniTab version 16® and descriptive and inferential statistics were used.

Results

Out of 63 patients, 89% (n = 56) were females and 11% were males. Eighty five percent (n = 55) had benign conditions and 13% had malignancies. All patients who had PC-iPTH level ≤5 pg/mL, got symptomatic hypocalcaemia and PC-iPTH level ≥ 25 pg/mL, were normocalcaemic on postop-D1. The patients with SACTC ≤1.88 mmol/L, developed hypocalcaemic symptoms. There was a statistically significant correlation between PC-iPTH level and SACTC on postop-D1 (Pearson correlation coefficient r = 0.972, adjusted R^2 = 94.33%, P <0.001). Regression equation for ACTC on Postop-D1 equals 1.7935 + 0.01582 PC-iPTH. Sensitivity of detecting postoperative symptomatic hypocalcaemia by doing PC-iPTH was 100% and specificity was 64.10% producing positive and negative predictive values of 45.28% and 100% respectively.

Conclusions

By performing PC-iPTH level, both biochemical and symptomatic hypocalcaemia can be predicted effectively enabling early calcium replacement therapy.

Keywords

Thyroidectomy, post-operative hypocalcaemia, pre-closure plasma intact parathyroid hormone, serum albumin corrected total calcium

ABSTRACTS OF RESEARCH PAPERS

RP 10

Determination of the Most Suitable Cut-off value for the Diagnosis of Impaired Glucose Tolerance Among Patients Presented to a Tertiary Care Center in Sri Lankan Setting

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Introduction

Diabetes mellitus is a metabolic disorder associated with multiple aetiologies. Impaired fasting glycaemia and impaired glucose tolerance in patients are important clinical aspects as they can predict the future diabetes and its complications. Therefore, oral glucose tolerance test and measurement of HbA_{1C} are important for patients with impaired fasting glycaemia.

Methods

This was an analytical laboratory based cross sectional study. One hundred twenty-three (123) participants were selected. The selected participants were those who were having fasting plasma glucose (FPG) value of 100-126 mg/dL (5.5-7.0 mmol/L), previously not diagnosed as having diabetes mellitus, presenting to the general medical clinic as cases for oral glucose tolerance test (OGTT) and HbA_{1C}. Participants were separated into two groups according to the FPG values. Comparison of proportions of impaired glucose tolerance and normoglycaemia between two populations with fasting plasma glucose between 100 – 110 mg/dL and 110 - 126 mg/dL were done to determine the most suitable cut-off value for the Sri Lankan setting. Statistical analysis was done using SPSS, Microsoft office excels 2016 and ANOVA.

Results

High risk of impaired OGTT was observed when FPG >110 mg/dL (odd ratio = 4.148) as these patient populations had significantly increased 2 hour-OGTT values ($P < 0.001$) and increased HbA_{1c} values of >6.1% (odd ratio = 10.06). Linear regression model was determined with FPG and OGTT values to predict HbA_{1c}. The r^2 was 0.369 and $P < 0.001$.

Conclusions

There was a significant risk of impaired glucose tolerance and elevated HbA_{1C} associated in patients who were having FPG value of >110 mg/dL. Therefore, among the two cut-off values 110 mg/dL can be used as the cut off value to detect the high risk for diabetes mellitus and combined FPG and OGTT with HbA_{1C} values can be used to detect the risk factors early.

Keywords

HbA_{1c}, impaired fasting glycaemia

ABSTRACTS OF RESEARCH PAPERS

RP 11

Effect of Different Levels of Serum Ascorbic Acid on Triglyceride and Total Cholesterol Estimation by Enzymatic Colorimetric Method

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Introduction

Measurement of exact levels of serum triglyceride and serum total cholesterol is important as those are used as risk indicators for coronary heart disease. Enzymatic colorimetric method is used in most clinical laboratories to measure serum triglyceride and total cholesterol levels, and is subjected to interference by numerous substances. Ascorbic acid is one of the interfering substances that may cause false results during serum triglyceride and total cholesterol estimation.

Method

Pooled serum was prepared from 18 healthy individuals. Pooled serum concentration of ascorbic acid (titration method), triglyceride (enzymatic colorimetric method) and total cholesterol (enzymatic colorimetric method) were measured. Ascorbic acid solutions of different concentrations (5 to 320 mg/dL) were added to pooled serum. Triglyceride and total cholesterol concentrations of those ascorbic acid added serum were measured. This procedure was repeated with different concentrations of triglyceride (baseline, 150, 100 and 70 mg/dL) and total cholesterol (baseline, 130, 100 and 70 mg/dL).

Results

Mean ascorbic acid, triglyceride and total cholesterol concentrations of pooled serum sample were, 1.1 (± 0.01) mg/dL, 166.617 (± 1.01) mg/dL and 178.729 (± 1.24) mg/dL, respectively. When 5 to 320 mg/dL of ascorbic acid was added to pooled serum, different concentrations of triglyceride and total cholesterol, a statistically significant ($P < 0.001$) negative interference was observed in both triglyceride and total cholesterol concentration.

Conclusions

Ascorbic acid negatively interferes with the enzymatic colorimetric method of serum triglyceride and total cholesterol estimation. The magnitude of negative interference was statistically significant even at 5 mg/dL of ascorbic acid. Thus, when we measure the serum triglyceride and total cholesterol level, the concentration of ascorbic acid could be considered especially for those who take vitamin C supplementation.

Keywords

Ascorbic acid, triglyceride, total cholesterol

ABSTRACTS OF RESEARCH PAPERS

RP 12

Development of a Screening Tool for Detection of Proteinuria Utilizing 25% Sulfosalicylic Acid Method and Evaluation of Its Association with the Microscopic Urine Deposit

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Introduction

Currently dipstick method is used for qualitative analysis and community screening of urine protein. However, urine dipsticks have some drawbacks such as mostly sensitive to urine albumin, less stability and expensive. The present study was conducted to develop a portable cost-effective semi-quantitative screening tool to detect proteinuria in a community setting using optimized 25% sulfosalicylic acid (SSA) method. Observations of urine deposits were conducted to evaluate correlation of urine deposit elements with the amount of urine protein.

Methods

A comparative cross-sectional study was performed using 60 urine samples, 30 from patients attending to nephrology clinic at Teaching Hospital, Karapitiya and 30 from healthy volunteers in Godakanda area. The screening tool's lines were designed using Photoshop 2019 by changing thickness, fill option and CMYK colour system. Protein concentrations were measured by both SSA method and pyrogallol red (PGR) method. Urine deposits were observed. Sensitivity, specificity, positive and negative predictive values (PPV and NPV) were calculated. Spearman correlation statistics were used in correlation analysis of urine deposit and the tool.

Results

Sensitivity, specificity, PPV and NPV of developed screening tool were 80%, 95.6%, 85.7% and 93.5% respectively. A strong linear relationship with the PGR method ($r^2 = 0.819$) was observed. A strong positive correlation was found between 25% SSA and PGR methods ($r = 0.791$, $P < 0.001$). There were positive correlations with protein concentration and RBC, WBC, transitional and renal cells, pus cell cast and bacteria in urine microscopy.

Conclusions

The developed 25% SSA screening tool shows a strong correlation with PGR method and has a higher sensitivity and higher specificity. It suggests that this tool can be used in population screening with minimum reagent cost and can be used in under resourced laboratories.

Keywords

Proteinuria, screening tool

ABSTRACTS OF RESEARCH PAPERS

RP 13

Prevalence of Non-alcoholic Steatohepatitis and Risk Factors Based on Biochemical Analysis among Staff, Who are Working in University of Jaffna

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Introduction

Sedentary lifestyle is one of the risk factors for the development of obesity, diabetes mellitus, hypercholesterolaemia and non-alcoholic steatohepatitis (NASH). Aspartate aminotransferase to alanine aminotransferase (AST/ALT) ratio of 1 or less and ALT >2 times upper limit of normal is considered as highly deteriorated liver function (HDLF), one of the criteria used to identify NASH biochemically. The staff (academic and nonacademic) who are working in the universities have a sedentary lifestyle at work. Aim of this study was to estimate the prevalence of NASH (HDLF) and the associated risk factors (obesity, hyperglycaemia, and hypercholesterolaemia) among staff members who are working at University of Jaffna.

Methods

A sample of 50 university staff was included in this laboratory-based study. Staff who were known diabetic, hypercholesterolaemic and liver disease were excluded. Random sampling method was performed to select the staff from each faculty. Glucose oxidase method, enzymatic colorimetric method and kinetic method were employed to estimate plasma glucose, serum cholesterol and serum ALT/AST respectively. AST/ALT ratio was calculated to assess the HDLF. Body mass index (BMI) was calculated using the formula weight/height^2 (kg/m^2).

Results

Among the total participants 36%, 42% and 22% were in normal, pre-diabetic and diabetic range respectively. Twenty six percent had the risk of HDLF. Among the diabetic population 72% had the risk of HDLF. It was statistically significant (P <0.001). Sixteen percent of staff were in the hypercholesterolaemic category and 75% of them were significantly associated with the risk of HDLF (P <0.001). About 4%, 40%, 34% and 22% were underweight, overweight, obese, and normal BMI respectively. Risk for HDLF was not influenced by BMI (P = 0.219).

Conclusions

About ¼ of the study population had highly deteriorated liver function. It was strongly associated with diabetes mellitus and hypercholesterolaemia and was not associated with obesity.

Keywords

Alanine amino transaminase, aspartate aminotransferase, body mass index, nonalcoholic steatohepatitis, serum total cholesterol

ABSTRACTS OF RESEARCH PAPERS

RP 14

Prevalence of Thyroid Dysfunction in Rheumatoid Arthritis Patients Attending Rheumatology Clinic

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Introduction

Rheumatoid arthritis (RA) leads to an increased prevalence of hypothyroidism. Subclinical hypothyroidism is used to describe patients who are clinically euthyroid with normal serum T_4 concentration but raised thyroid stimulating hormone (TSH), usually <10 µIU/mL. The measurement of serum levels of TSH and free T_4 are recognized as sensitive methods in the diagnosis of thyroid function defects. Previous studies show that there is a high prevalence of hypothyroidism in rheumatoid arthritis patients, but no studies were carried out in Sri Lankan population. Earliest diagnosis of hypothyroidism at the subclinical stage is a valuable tool to prevent its complications such as cardiovascular diseases.

Methods

Laboratory based cross sectional study was conducted on 62 patients with RA attending rheumatology clinic, Teaching Hospital, Jaffna. Serum TSH and free T_4 levels were measured by enzyme linked immunosorbent assay (semi-automated). Data were analyzed by SPSS version 23.

Results

Out of 62 patients with RA 09 (14.5%) were males. The mean age of the patients with RA was 50.3 (± 15.36) years. The mean TSH level was 5.7 (± 6.74) µIU/mL [males and females were 6.9 (± 4.83) and 5.5 (± 6.93) µIU/mL respectively, (P = 0.222) at 95% confidence level]. The mean free T_4 level was 8.8 (± 2.63) pg/mL [males and females were 7.9 (± 1.93) pg/mL and 8.9 (± 2.72) pg/mL respectively, (P = 0.282) at 95% confidence level]. Among the patients with RA 54.8% had normal thyroid functions while 22.6% had subclinical hypothyroidism (TSH range 7.11 - 12.29 µIU/mL), 4.8% had primary hypothyroidism and 17.7% had normal TSH with low free T_4 which could be due to non-thyroidal illnesses, assay interferences, thyroid hormone resistance or secondary hypothyroidism. In both genders most of the patients with RA had normal thyroid functions and highest thyroid defect was the subclinical hypothyroidism.

Conclusions

This study showed that the thyroid dysfunction, especially hypothyroidism occurs more frequently compared to hyperthyroidism in RA patients. None of the patients included in this study were identified with hyperthyroidism. Subclinical hypothyroidism is most frequent in elderly patients. This calls for attention to screen the patients with RA for hypothyroidism.

Keywords

Rheumatoid arthritis, hypothyroidism, subclinical hypothyroidism, thyroid dysfunction

ABSTRACTS OF RESEARCH PAPERS

RP 15

Study on Usefulness of Enhanced Liver Fibrosis Score to Assess Early Fibrosis in Non-Alcoholic Fatty Liver Disease against FibroScan in a Clinical Setting

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Introduction

Non-alcoholic fatty liver disease (NAFLD) is the commonest chronic liver disease world-wide. Liver biopsy is the most reliable test to diagnose, assess degree of fibrosis and determine prognosis. FibroScan-liver stiffness measurement (FSLSM) by transient elastography (TE) and serological markers as Enhanced Liver Fibrosis (ELF) score are emerging non-invasive tests to detect NAFLD. ELF score comprises of hyaluronic acid (HA), procollagen-3-aminoterminal peptide (P3NP) and tissue inhibitor of metalloproteinase 1 (TIMP 1). TE and ELF score are validated against liver biopsy to detect fibrosis in NAFLD patients. Indirect biomarker panels such as aspartate transaminase to platelet ratio index (APRI) and NAFLD fibrosis score (NFS) are also used to detect liver fibrosis.

Methods

TE by FSLSM, AST (aspartate transaminase), platelet count and ELF score were performed on 88 NAFLD patients (ultrasound scan grade 1-3) between 18 to 60 years (45 males). APRI, NFS and ELF were calculated. APRI, NFS and ELF score were compared with FSLSM for liver fibrosis. Statistical analysis was done using SPSS version 25.0.

Results

The range and mean (SD) for FSLSM were 1.7 - 52.4 and 10.5 Kpa (6.98) and those for ELF score were 5.4 - 11.56 and 8.6 (0.92). Mean (SD) for APRI and NFS were 0.36 (0.22) and 2.58 (1.29). The mean (SD) for HA, P3NP and TIMP were 32 ng/mL (34), 9.2 ng/mL (3.49) and 210 ng/mL (56) respectively. The ELF score showed a sensitivity, specificity and AUC of 78%, 19%, 0.51 while those for APRI was 35%, 83%, 0.664 and for NFS 21%, 82%, 0.592 respectively.

Conclusions

Both APRI and NFS methods show low sensitivity but specificity was found to be high. ELF score had reasonable sensitivity against FSLSM and shall be compared with liver biopsy in further studies to develop cut-off level in Sri Lankan setting.

Keywords

Fatty liver, transient elastography, FibroScan, enhanced liver fibrosis score

ABSTRACTS OF RESEARCH PAPERS

RP 16

Thyroid Function Abnormalities and Their Association with Serum Ferritin Levels in Thalassaemic Patients at a Tertiary Care Hospital in Sri Lanka

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Introduction

Recurrent blood transfusions in thalassaemia major patients cause iron overload leading to endocrinopathies. Their prevalence varies widely in different populations in the world and local data are limited. We aimed to study thyroid function abnormalities in a local population of thalassaemia major.

Methods

The study included 111 thalassaemia major patients (age range 1-28 years); 51 males (46%) and 60 females (54%). Results of endocrine tests requested by the clinic, at a tertiary care hospital were used to extract data. Serum ferritin levels were used to assess the iron status excluding patients with high CRP. Thyroid function and other hormone levels were used to assess endocrine abnormalities. The tests were done by a chemiluminescence immunoassay method (Beckman Coulter Access II). Data analysis was by "R" statistical software version 4.0.3.

Results

The mean ferritin was 2707.2 µg/L indicating iron overload in the population. Mean TSH was 2.6 µIU/mL. Thirteen (11.7%) patients had elevated TSH (with normal free T_4) according to age and sex specific reference intervals. This is a lower prevalence compared to the other studies done in Asian and Middle-Eastern countries. Low prevalence of hypothyroidism was reported in an earlier study, in Sri Lanka. The percentage of hypothyroidism was higher in the 13-19 age group (8%), while male and female distribution was 7.2% and 4.5% respectively. There was no significant association between the mean TSH values of, ferritin >2500 and <2500 groups (P = 0.0285). A higher percentage (58.3%) of hypothyroid patients had a ferritin level of <2500 µg/L. There was no significant association between serum ferritin and TSH (r^2 = 0.04; P = 0.0285). Gonadotrophins (FSH/LH) were requested only in 9 patients and all results were within normal limits. Previous studies show that hypogonadism is more prevalent than hypothyroidism.

Conclusions

Rate of hypothyroidism appear to be lower in Sri Lankan iron-overload-thalassaemic patients. Monitoring for other endocrinopathies is recommended.

Keywords

Thalassaemia, iron overload, ferritin, thyroid function abnormalities

ABSTRACTS OF RESEARCH PAPERS

RP 17

Comparison of Urinary 25% Sulfosalicylic Acid Protein to Creatinine Ratio vs Pyrogallol Red Protein to Creatinine Ratio in a Group of Healthy Individuals and Optimization of the Sample Volume for the Urinary 25% Sulfosalicylic Acid Method

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Introduction

Evaluation of proteinuria is considered an important marker in the diagnosis, prognosis and management of kidney diseases. Recently, 25% sulphosalicylic acid (SSA) turbidimetric assay has been optimized for the quantitative evaluation of proteinuria in 3-50 mg/dL range. Also, 25% SSA protein to creatinine ratio (PCR) has shown comparable results compared to the gold standard pyrogallol red (PGR) PCR in patients with chronic kidney disease. The current study involved application of this method to a group of healthy individuals to ensure its clinical applicability throughout the normal range of proteinuria and optimization of the sample volume for 25% SSA method which enables its automation.

Method

A comparative cross-sectional study was performed using urine samples from 30 healthy volunteers in Godakanda Public Health Midwife area and 32 patients attending nephrology clinic, Teaching Hospital, Karapitiya. Samples from healthy volunteers were used to assess the association and agreement between urinary 25% SSA PCR and PGR PCR using Spearman correlation and Bland-Altman plot respectively. All the 62 samples were used for volume optimization for the 25% SSA method using 2 mL, 1 mL and 0.5 mL volumes and the data were analyzed by general linear model for repeated measures.

Results

The Spearman correlation between urinary 25% SSA PCR and PGR PCR in healthy individuals was 0.642 ($P < 0.01$) and Bland-Altman plot gave a bias of 6.37 mg/g. Pairwise comparison of volume optimization data by general linear model for repeated measures showed statistically insignificant mean concentration variations between 2 mL and 1 mL (24.72 vs 19.85 mg/dL respectively, $P = 0.677$) and 2 mL and 0.5 mL volumes (24.72 vs 25.84 mg/dL respectively, $P = 1$).

Discussion

The urinary 25% SSA PCR showed a strong positive correlation and a fair agreement with PGR PCR for the samples from healthy volunteers ensuring its clinical applicability throughout the normal range of proteinuria. Pairwise comparison of the volume optimization data indicates an insignificant volume effect for 25% SSA protein concentration as measured using 2 mL, 1 mL and 0.5 mL volumes enabling the automation of the method.

Keywords

25% Sulfosalicylic acid method, quantitative evaluation of proteinuria, screening of proteinuria, chronic kidney disease, automation of 25% sulphosalicylic acid method

ABSTRACTS OF RESEARCH PAPERS

RP 18

Use of Serum and Pleural Fluid Adenosine Deaminase Level in Diagnosing Tuberculous Pleural Effusion in Patients Who are Undergoing Thoracentesis at National Hospital for Respiratory Diseases, Sri Lanka

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Introduction

Tuberculosis (TB) is caused by the bacillus *Mycobacterium tuberculosis*. About one quarter of the world is infected with this organism, but only 10% will develop the disease in their lifetime. Sri Lanka falls into middle burden country. Though adenosine deaminase (ADA) levels in pleural fluid (PF) is well studied and used in the diagnosis of TB, limited literature available on ADA and TB on its diagnostic validity in the local context.

Methods

A descriptive cross-sectional study was conducted in the National Hospital for Respiratory Diseases (NHRD). Ninety-seven patients who had pleural effusion (PE) and underwent diagnostic thoracentesis at NHRD participated in the study. PF and serum samples were analyzed for ADA using Diazyme adenosine deaminase reagent kit in Beckman Coulter AU 480 in the Chemical Pathology Department at NCTH. Data were entered using excel and analyzed using SPSS.

Results

Mean age of the population is 56.3 years and the majority was male (70.7%). There were thirty-six (36.4%) patients with TB, thirty-three (33.3%) patients with infections causing PE other than TB, nineteen patients (20.2%) with malignant PE, and ten (10.1%) patients with other systemic causes leading to PE. Tuberculosis was the most prevalent cause for PE in patients who underwent thoracentesis at NHRD. Mean PF ADA value of TB patients was 49.7 U/L (SD = 40.87) and serum ADA was 22.1 U/L (SD = 11.5). The best diagnostic value for PF ADA according to ROC curve was 30 U/L which had 80.0% sensitivity, 69.8% specificity and 0.749 of AUC. The ROC analysis of serum ADA level has shown poor discriminative values.

Conclusion

The proposed PF ADA cut-off value of 30 U/L has shown the best sensitivity (80.0%) and specificity (69.8%) for TB diagnosis. There is no correlation of PF ADA and serum ADA in TB patients but there is a mild correlation (r = 0.415) in non-TB population.

Keywords

Pleural fluid, adenosine deaminase, tuberculosis

ABSTRACTS OF RESEARCH PAPERS

RP 19

A Study on Vitamin D Status of a Group of Indoor and Outdoor Workers in Karapitiya, Galle

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Introduction

Sun light exposure is considered as the major determinant factor of one's vitamin D status in the body. Due to the sedentary lifestyles, people are less exposed to sunlight and the chances of being vitamin D deficiency is high.

Methods

A cross-sectional study was conducted by recruiting 96 indoor and outdoor male workers who were working in Teaching Hospital Karapitiya and construction sites around that area. All outdoor workers had daily sun exposure above 2 hours and it was approximately 15–30 minutes for majority of indoor workers. Serum 25-hydroxy-vitamin D (25(OH)D) level of each participant was measured using chemiluminescence method. Socio demographic features and work-related facts were recorded using a pre-tested interviewer - administered questionnaire. Data were analyzed using SPSS version 20.

Results

Mean ages of outdoor and indoor workers were 34.4 ± 11.1 years and 36.4 ± 8.2 years respectively. Mean 25(OH)D levels of outdoor and indoor workers were 17.94 ± 3.85 ng/mL (95% CI 16.82,19.05) and 16.79 ± 4.52 ng/mL (95% CI 15.48, 18.11) respectively (P = 0.185). The prevalence of vitamin D deficiency (<20 ng/mL) was 73% and 27% of the participants were vitamin D insufficient (21–30 ng/mL). Significantly different 25(OH)D levels were found with respect to marital status, educational level and monthly income (P <0.05). Serum 25(OH) D levels between groups with different work tenure, number of working hours per day and number of working hours per week did not show any significant difference (P >0.05).

Conclusions

Serum 25(OH)D levels of indoor and outdoor workers were not significantly different. All participants of the study group were either vitamin D deficient or insufficient. However, as the reference ranges of vitamin D status for Sri Lankan population is not well stated, further studies are needed to confirm the same.

Keywords

Vitamin D, 25-hydroxyvitamin D, indoor workers, outdoor workers

ABSTRACTS OF RESEARCH PAPERS

RP 20

An Audit to Assess the Serum Iron Profile Request Forms and Compatibility of the High Transferrin Saturation Results with the History

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Introduction

The prevalence of high transferrin saturation (>60%) among global population is about 2%. It is caused by haemochromatosis (hereditary or acquired), repeated blood transfusion, alcoholic liver disease and chronic hepatitis. Aim of the study is to assess the completeness of the request forms for iron studies and the agreement of high transferrin saturation results with the clinical history and biochemical investigations.

Methods

All the request forms for iron studies received at the biochemistry laboratory, National Hospital of Sri Lanka from 15th of March 2021 to 30th of April 2021 were reviewed. Patient identification details, history, relevant investigations and sample collection data were used as standards for the completeness. Clinical history and serum ferritin results were obtained, for those with high serum transferrin saturation (>60%). Data were analyzed using Excel 2016 MSO and SPSS version 21.

Results

Total of 592 requests were analyzed. Among them 95% of the request forms did not meet the standards for completeness. However, 7% (42/592) of reports had high serum transferrin saturation of above 60%. Among them 40.5% (17) were from chronic liver cell disease (CLCD), 38% (16) were from chronic kidney disease (CKD), 19% (8) were from thalassaemia and 2.5% (1) from heart failure patients. 100% agreement was seen in-between clinical history, serum ferritin and serum transferrin saturation results for CLCD. According to the history, samples from thalassaemia patients were obtained following blood transfusion within 48 hours.

Conclusion

Majority (95%) of the requests did not meet the standards for the completeness of the request forms, where appropriate information is needed for clinical validation of results. High saturation was detected among CKD patients and causes need to be elaborated by further studies. Analysis of serum iron is not recommended following recent blood transfusion which can give falsely high transferrin saturation.

Keywords

Iron, transferrin saturation, haemochromatosis

ABSTRACTS OF RESEARCH PAPERS

RP 21

Audit Report on Thyroid Hormone Requesting Pattern in Wards and Clinics of National Hospital Sri Lanka

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Introduction

Radioimmunoassay (RIA) laboratory of the National Hospital of Sri Lanka (NHSL) gets requests for thyroid hormones from NHSL and a few peripheral hospitals. This audit was carried out to identify the requesting pattern against standards instructed by the laboratory. We aimed to assess the requesting pattern, indications for requests, provision of clinical history for inclusion of interpretative comments and adherence to guidelines given by laboratory for request form filling.

Methods

We retrospectively reviewed all thyroid requests received at the RIA laboratory NHSL in January 2021and analysed data in Excel.

Results

A total of 751 requests were studied out of which 66.44% were from inward patients. The proportion of TSH only, TSH with free T_4 (fT_4), TSH with fT_4 and free T_3 (fT_3), fT_4 only were 6.52%, 84.28%, 8.26% and 0.93% respectively. Out of all, 20.5% requests had only first name without surname. Standards were met in a majority of request forms (92%) with regard to age, gender and BHT number. Clinical information was not given in 49.4%. Among the requests with a diagnosis, drug history was mentioned in 38.57%; previous result was not mentioned in >95%. Standards for information on the requesting personnel (name, signature and stamp) were fulfilled in 92.54% of inward patients, while only 64.29% fulfilled in outpatients. Date and time of sample collection were absent in >99%.

Conclusions

Absence of clinical history, drug history and previous results in majority of requests prevents chemical pathologist giving appropriate interpretative comments. Absence of date and time of sample collection, collector's name and signature in majority indicates lack of concern of ward/clinic staff for the quality of the results. Inadequate information on requesting personnel which was mostly seen for outpatients indicates unauthorised requesting. Proper filling of the request form is important to validate results clinically, improve quality, reduce cost of repeat testing and prevent unauthorised requesting.

Keywords

Thyroid hormone requests, audit

ABSTRACTS OF RESEARCH PAPERS

RP 22

Evaluation of the Immune Response to Covishield Vaccine, in a Cohort of Participants in Colombo

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Introduction

As a part of the global effort to combat SARS Cov2 infection the vaccination program using Covishield (ChAdOx1 nCOV-19) vaccine, one of the first introduced and most popular brands, was launched in early 2021 in Sri Lanka. To assess the success of the initiative it is essential to assess the immune response among recipients for future decision making. The study aimed to assess humoral immune response to 1st dose of Covishield vaccination prospectively in a cohort and to correlation of response to age, sex, body mass index (BMI), and comorbidities.

Methods

This is an ongoing study. Participants were consecutive who were willing. Following the clearance from ethical review committees of National Hospital of Sri Lanka (NHSL) and Colombo South Teaching Hospital (CSTH), blood samples were collected from consented vaccine recipients from 28.01.2021 to 14.05.2021 on day 0, 14, 21 of the vaccination as the first phase of the study. Interviewer administered questionnaire was used to collect relevant data. Total antibody levels to receptor binding domain (IgM and IgG) were measured using Advia XP chemiluminescence assay at radioimmunoassay laboratory, NHSL.

Results

Out of 190 recruited participants (45.45% male and 54.55 % female) seroconversion observed in 87.5% on day 14 and 95.0 % on day 21 following a single dose of the vaccine irrespective of age, gender and BMI. Immune response was similar across almost all age groups with a maximum response on day 21 (mean - 12.73 index) with an exception in participants of >80 years who failed to show an adequate immune response throughout. Participants with a low BMI (<18.5 kg/m^2) showed an inadequate immune response while BMI of >30 kg/m^2 showed a slow but an increasing response with time. Participants with chronic diseases showed a similar response to the healthy ones but had a much higher peak at day 21 in the healthy category.

Conclusions

A single dose of the vaccine was shown to be highly immunogenic in previously non infected patients.

Keywords

Covishield, immune response, Sri Lanka

ABSTRACTS OF RESEARCH PAPERS

RP 23

Screening of *PCSK9* Variant, *rs11591147*, with a Novel Method in a Cohort of Patients with Familial Hypercholesterolaemia

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Introduction

Familial hypercholesterolaemia (FH) is one of the commonest inherited metabolic diseases which typically presents with elevated serum low-density lipoprotein cholesterol (LDL-C) more than 290 mg/dL at ages less than 40 years predisposing cardiovascular diseases. More than thousand low-frequency variants in three genes, *LDLR, APOB,* and *PCSK9,* have been implicated in FH. The discovery of proprotein convertase subtilisin/kexin type 9 *(PCSK9),* 72-kd secretory protease, has opened a new era of pharmacological modulation of cholesterol homeostasis. Nevertheless, certain mutations of the *PCSK9* gene appear to hinder the expected results in certain patients. Thus, this study was aimed at designing of a novel PCR assay for the identification of *PCSK9* genetic variants in a cohort of patents in Sri Lanka diagnosed with FH.

Methods

Following a comprehensive literature review single nucleotide polymorphism (SNP) *rs11591147* G>T variant was selected for the purpose of development of a novel assay for screening. An allele specific PCR assay was developed to detect the variant and was validated using Sanger sequencing. The assay was established by genotyping of 18 unrelated patients with a clinical diagnosis of familial hypercholesterolaemia at the Human Genetics Unit, Sri Lanka.

Results

The expected band sizes at 428 bp, 285 bp and 188 bp indicated the wild type allele, heterozygous allele and the homozygous allele for the pathogenic variant respectively. Out of the 18 patients tested, no heterozygotes or homozygotes for the pathogenic variant was detected.

Conclusion

This study is first of its kind to screen the *PCSK9* genetic variants in Sri Lanka and the frequency of the variant is similar to epidemiological information of the region. Nevertheless, the designed assay will allow the application of precision medicine for the prevention of premature atherosclerotic cardiovascular disease in at-risk patients.

Keywords

Familial hypercholesterolemia, *PCSK9*, single nucleotide polymorphism

ABSTRACTS OF RESEARCH PAPERS

RP 24

Factors Associated with Chronic Kidney Disease of Unknown Aetiology Among Patients Who Seek Treatment from the Nephrology Clinic at District General Hospital –Vavuniya

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Introduction

Chronic kidney disease of unknown etiology (CKDu) is one of the major health care problems in Sri Lanka. This study is designed to identify potential causes of CKDu based on social-cultural factors and water quality parameters among the patients who sought treatment from nephrology clinic, District General Hospital (DGH)-Vavuniya.

Methods

The study was a community-based case-control study and the case group consisted of 106 patients who have CKDu whereas the control group consisted of 100 people who willingly participated and lived in the vicinity of the patient houses, and had not reported kidney disease (confirmed by screening program of CKD unit). The water samples were collected from their drinking water source which was used for more than five years before being diagnosed with CKDu. A questionnaire and data collection sheet were used as the study instruments. Parameters of the water quality, such as pH, total dissolved solvent (TDS), electrical conductivity, and turbidity were measured using the respective meter. The colour of the water sample and electrical conductivity were evaluated according to the WHO and national recommended standards. The chi square test was used to assess the association among causes.

Results

In the CKDu population 85 (80.2%) were males and 21 (19.8%) were females compared to the control group with 68 (86%) males and 32 (32%) females. Out of 106 CKDu patients, 52 had occupations related to farming (farmers and agricultural laborers). There is a significant association between CKDu and occupations associated with farming ($P = 0.001$). Furthermore, exposure to weedicide also showed significant association ($P = 0.001$). However, there is no single water quality parameter that could clearly and directly be related to the etiology of CKDu.

Conclusions

Exposure to weedicides was prevalent in individuals who have occupations associated with farming which may be one of the reasons that farming shows a significant association with CKDu.

Keywords

Chronic kidney disease of unknown etiology, water quality parameters, weedicide

ABSTRACTS OF RESEARCH PAPERS

RP 25

A Survey on Laboratory Report Tracing Practices at a Tertiary-care Hospital as an Initiative to Introduction of a Computer-based Report Viewing System

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Introduction

Post-analytical errors account for 18.5 - 47% of laboratory errors. Based on current practices at government hospitals, validated reports are printed and sent to respective units. Time taken for printing, sorting, couriering, and informing critical results influence turnaround-time (TAT), thus risk optimal patient care. A point-of-care computer-based report viewing can significantly improve TAT in post-analytical phase. This survey evaluated current report tracing practices of clinical staff at a tertiary-care hospital, their acceptance, and infrastructure availability for a computer-based system.

Methods

Five members from each unit, mostly involved in report tracing (as decided by clinical staff), were selected mounting to 200 doctors/nurses from 40 units, and 190 responses were received. Computer-based report-viewing was introduced to units equipped with infrastructure simultaneously with the survey.

Results

Of the respondents, 27%, 25%, 12%, and 17% were from medical, surgical, paediatric, and acute-care units, respectively, while 59.5% of them were doctors and the rest were nurses. A majority (94%) daily contacted laboratory to trace urgent/missing reports (50%: 1 - 2 times/day, 27.4%: 3 - 5 times/day, 6%: 6 - 10 times, 1%: >10 times/day). Only 24.6% of their calls were answered immediately. Average time taken to trace a missing/urgent report by calling/sending somebody to laboratory was 18.7 minutes. Although majority (95.2%) agreed that computer-based report viewing would improve TAT, 11 (28%) units had no computers while 18 (45%) units had no local-area-network hindering introduction of computer-based report viewing. Therefore, only 29 units with infrastructure were introduced computer-based report viewing using computers. All participants had mobile-devices with internet access.

Conclusion

Healthcare professionals spend a significant amount of time tracing laboratory reports during daily practice, increasing test TAT with possible adverse effects on patient care. Although a computer-based system may improve post-analytical phase, infrastructure unavailability can hinder its application. Therefore, authors suggest using a password-protected computer-based system accessible via both hospital local-area-network and internet using computers and mobile devices.

Keywords

Turnaround time, laboratory report tracing, post-analytical errors

ABSTRACTS OF RESEARCH PAPERS

RP 26

Audit on Pre-analytical and Post-analytical Errors in Testing for Thyroid Functions at Colombo North Teaching Hospital – Ragama

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Introduction

Thyroid function tests (TFTs) are the most commonly requested hormonal assays in clinical practice. The interpretation of TFT is straightforward in most instances, but it is crucial to revisit the clinical details and consider further investigations if discordant. Assessing TFTs at a low index of clinical suspicion can lead to inappropriate investigation and management following confounding results.

Methods

To evaluate pre-analytical and post-analytical errors in thyroid function testing at Colombo North Teaching Hospital, Standard flowcharts for requesting TFTs were designed, and 350 TFT requests were assessed retrospectively with their results.

Results

Out of 350 requests, 48.3% were from clinics, while 35.7% were from inward patients. In the request forms, age, sex, and clinical details were not mentioned in 9%, 47%, and 77%, respectively. One-third of them (33.7%) had requested a complete thyroid profile (TSH, T_4, T_3), while 25% had requested TSH with T_4. Analysis of TFT results revealed that most (71%) had a euthyroid status and 1% had inconsistent TFT statuses. Based on the available information, only 16.3% of requests were deemed clinically appropriate, while 32% were clinically inappropriate due to requesting the complete thyroid profile. Of the clinically appropriate requests, 63% were from clinics that were statistically significant ($P = 0.002$). T_4 and/or T_3 were unnecessarily requested in 31% of requests. According to the standards for TFT reporting, the laboratory had done reflexive T_3/T_4 testing in 1% of the requests, whereas the laboratory had failed to conduct appropriate reflexive testing in 3% of the instances.

Conclusion

A majority of TFT requests failed to meet the required standards, leading to clinically inappropriate/unnecessary testing, thus wastage of resources. The provision of relevant clinical details can pave the path for better reflexive testing, thus improving the post-analytical phase. Adapting a standard flowchart for TFT requesting can be applied to overcome the above shortcomings.

Keywords

Audit, thyroid functions, laboratory cost reduction, reflexive testing

ABSTRACTS OF RESEARCH PAPERS

RP 27

Audit on Completeness of Serum Protein Electrophoresis Requests Received by Colombo North Teaching Hospital – Ragama

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Introduction

Serum protein electrophoresis (SPE) is a commonly utilized second-line investigation to evaluate abnormalities in serum proteins. It is the primary modality of screening and assessing treatment response in plasma cell dyscrasias. The provision of a better clinically correlated report on serum protein electrophoresis requires a duly completed request form, including patient identification and clinical information.

Methods

To evaluate the completeness of the SPE request forms received by the laboratory and suggest recommendations to improve the quality, a set of standards were designed based on the WHO Laboratory Quality Stepwise Implementation Tool on request form for laboratory testing and institutional agreement on required clinical information for SPE. Three hundred and one SPE requests received from January to May 2020 were subjected to retrospective assessment.

Results

Out of 301 requests, 19 samples were not accompanied by a proper request form due to possible misplacement. The rest of the 282 request forms were assessed for completeness concerning set standards. A majority (52%) of requests for SPE was from medical wards, and according to the available information (166/282), a majority (53%) was requested by House Officers. Only 15% (n = 42) requests met all the standards required to provide a quality SPE report. Of acceptable request forms, most (15/42) were sent from the haematology clinic. Only 1/3 of the requests fulfilled the standards for patient identification details, while a majority lacked the relevant clinical information; clinical presentation in 51%, ancillary investigation results in 88%, and working diagnosis in 76%. None of the requests contained information that would allow contacting the requesting doctor for further clarifications.

Conclusion

A majority of SPE requests failed to meet the required standards regardless of the seniority/ qualification of the requesting doctor. Authors suggest introducing a special request form listing required details for SPE and continuous professional education for the doctors to improve the quality of SPE requesting.

Keywords

Audit, serum protein electrophoresis, test request form

ABSTRACTS OF RESEARCH PAPERS

RP 28

Comparison of Interference by Bilirubin and Glucose on the Serum Creatinine Measurement by the Jaffe and Enzymatic methods

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Introduction

Creatinine is a metabolic by-product of creatine that facilitates recycling energy mainly in the muscle and brain. The two assays available for creatinine measurement include the picric acid-based Jaffe method and the enzymatic method. Jaffe method is susceptible to non-creatinine chromogens such as protein, glucose, ascorbic acid, cephalosporin and ketones.

Methods

The interferences by bilirubin and glucose on creatinine measurement by Jaffe method and enzymatic method were assessed using a series of creatinine ranging from 60 – 900 µmol/L and spiking the samples with four levels of bilirubin and glucose.

Results

Both methods were affected by an increasing average negative bias with the 4 levels of bilirubin (Jaffe: -3.2%, -1.1%, -8.9%, -15.7% and enzymatic: -0.7%, -1.6%, -7.0%, -15.5% for the 4 levels of bilirubin; 2, 18, 24, and 36 µmol/L respectively). According to the regression analysis, an increasing negative constant bias was observed between the Jaffe and the enzymatic methods with bilirubin interference (+4.6 µmol/L without bilirubin, -7.3µmol/L with 36 µmol/L of bilirubin). When the percentage bias was considered, it significantly affected both assays at bilirubin levels >36 µmol/L. There was an increased positive bias observed only with the Jaffe method compared to the enzymatic method with the interference by glucose (Jaffe: 1.7%, 4.3%, 6.9%, 9.4% and enzymatic: 1.5%, 1.4%, 1.6%, 0.2% for the four levels of glucose 100, 150, 250, 500 mg/dL). According to the regression analysis, a decreasing negative constant bias was observed between the Jaffe and the enzymatic methods with glucose interference (-10.6 µmol/L without glucose, -2.4 µmol/L with 500 mg/dL glucose).

Conclusion

Both Jaffe and enzymatic creatinine assays are equally affected by bilirubin interference while glucose significantly has an interference only on the Jaffe method. The percentage bias was within clinically acceptable limits (<15%) at all tested bilirubin levels and glucose except for the situations when the bilirubin is >36 µmol/L.

Keywords

Creatinine, Jaffe method, enzymatic method, glucose interference, bilirubin interference

ABSTRACTS OF RESEARCH PAPERS

RP 29

Comparison of MDRD vs CKD-EPI Equations for Calculation of eGFR Using Creatinine by Jaffe vs Enzymatic Assays

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Introduction

Estimated glomerular filtration rate (eGFR) based on serum creatinine is widely applied for chronic kidney disease (CKD) classification in place of creatinine clearance. Enzymatic assay has less interferences compared to Jaffe method producing more reliable creatinine measurements. This study aimed to compare the performance of MDRD and CKD-EPI equations on CKD-classification in Sri Lankan patients when using creatinine by Jaffe vs enzymatic assays.

Methods

A descriptive study was conducted using 80 serum samples from specimens received for creatinine measurement at a teaching hospital laboratory in Western province. Serum creatinine was measured by both assays and paired t-test was used to compare the eGFRs calculated by two equations using creatinine by both assays.

Results

Mean creatinine value by Jaffe method was 76.2 µmol/L (SD = 68, range: 14.7 - 396.4) and 96.4 µmol/L (SD = 78.7, range: 35.8 - 499.9) by enzymatic assay. Mean eGFR values were 127 mL/min/1.73 m^2 (SD = 85.9) by MDRD and 97.7 mL/min/1.73m^2 (SD = 34.5) by CKD-EPI for creatinine by Jaffe method; 84.1 mL/min/1.73m^2 (SD = 36.2) by MDRD and 83.3 mL/min/1.73m^2 (SD = 30.4) by CKD-EPI for creatinine by enzymatic assay. MDRD equation overestimated the eGFR compared to CKD-EPI, irrespective of the creatinine assay ($P < 0.001$), and creatinine by Jaffe method overestimated eGFR compared to enzymatic assay irrespective of the equation used for eGFR calculation ($P < 0.001$). eGFRs calculated by MDRD and CKD-EPI equations using creatinine by enzymatic assay had no statistically significant difference ($P = 0.628$). Using CKD-EPI and creatinine by enzymatic assay as the reference standard for eGFR calculation, 20% were misclassified to a lower CKD-stage when using MDRD with creatinine by Jaffe method.

Keywords

Chronic kidney disease classification, MDRD equation, CKD-EPI equation, Jaffe method, enzymatic creatinine assay

ABSTRACTS OF RESEARCH PAPERS

RP 30

A Comparison of Serum Albumin by Electrophoresis on Sebia Hydrasis 2 with Two Dye-Binding Methods

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Introduction

Albumin appearing on the serum protein electrophoresis (SPE) report is calculated indirectly based on electrophoretic separation, taking the total area on the electrophoretic pattern to represent the measured serum total protein. Laboratories measure serum albumin by dye-binding methods, either bromocresol green (BCG) or the more expensive but specific bromocresol purple (BCP). We compared 3 methods in samples received for SPE.

Methods

Serum albumin was measured on 114 routine samples received for SPE by electrophoresis on Sebia Hydrasis 2, by BCG on Roche Cobas c311 and by BCP on Dimension RxL. Total protein was measured on Cobas c311 by Biuret method.

Results

Bland-Altman analysis of results (n = 114) showed a positive bias of BCG with both SPE (mean 4.9 g/L; 95% limits 0.68 – 7.49) and BCP (mean 5.50 g/L; 95% limits 2.24 – 6.05). BCP and SPE agreed more closely (mean -1.42 g/L; 95% limits -5.13 – 2.30).

Conclusion

The BCG and BCP methods are the currently preferred methods in clinical laboratories. At low albumin and high globulin concentrations, BCG has been found to bind to alpha and beta globulin fractions. One method to improve the specificity of the BCG assay is by reducing the read time. Interference by other proteins is significant at read times greater than 300 seconds. The Roche BCG albumin assay has a read time of 95 seconds. Nevertheless, BCP is in good agreement with the immunonephelometry, one of the gold standard techniques for measurement of albumin, and SPE. It is thus superior to bromocresol green (BCG), which overestimates serum albumin, particularly in patients with low concentrations of albumin who may also have increased globulins or monoclonal bands.

Keywords

Serum albumin, bromocresol green, bromocresol purple, serum protein electrophoresis

ABSTRACTS OF RESEARCH PAPERS

RP 31

Comparison of Methods for Detection of Bence Jones Protein; Heat and Immunofixation Electrophoresis

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Introduction

The Bence Jones protein urine test is most often used to diagnose and check on multiple myeloma (MM). MM is a haematological malignancy caused by the intense indiscriminate proliferation of plasma cells in the bone marrow. As a consequence, immunoglobulins and their fragments accumulate in peripheral blood. The excess of immunoglobulin light chains is filtered at the glomerulus and appears in the urine, being called monoclonal proteins of Bence Jones (BJP). The commonly used method for detection of BJP in Sri Lanka is the heat test, due to its low cost. However, the gold standard is immunofixation electrophoresis (IFE) because of its sensitivity, ability to demonstrate monoclonality and the absence of heavy chains. Heat test was previously used to detect BJP in our laboratory.

However, we were unable to satisfy the accuracy in College of American Pathologists Proficiency Testing, (CAP PT), as we were unable to identify the true positive samples out of the two samples provided in the PT survey. However, when we reported using IFE, we achieved a score of 100%.

Methods

Urine samples of 37 patients were tested for BJP using the heat test and IFE on Sebia hydrasys 2.

Results

15 samples (40.5 %) were positive by IFE whereas only 3 (8.3%) were positive by heat test.

Conclusion

The heat test which is commonly used in most laboratories, is not sensitive enough to identify true positives at low concentrations of monoclonal proteins. Despite its low cost, it runs the risk of misdiagnosing true myeloma patients. It should be discontinued as it poses a great risk to patient safety. Laboratories should adopt IFE and ensure good laboratory practices (GLP).

Keywords

Bence Jones protein, heat test, immunofixation electrophoresis, good laboratory practices

ABSTRACTS OF RESEARCH PAPERS

RP 32

Evaluation of 25% Sulfosalicylic Acid Test and Its Correlation to Urine Osmolality and Specific Gravity in a High-Risk Population for CKDu in Sooriyawewa

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Introduction

Previous studies have found that 25% sulfosalicylic acid test (SSA) can be used to quantitate low grade proteinuria (3–50 mg/dL). This study aimed at evaluating the 25% SSA test in a population at risk of chronic kidney disease of unknown origin (CKDu). Dehydration is considered as a probable etiology for CKDu. Urine osmolality and specific gravity are markers of hydration status. Therefore, we assessed the correlation of urine osmolality and specific gravity with the index test in the same cohort.

Methods

A case control study was conducted in one Grama Niladhari division of Sooriyawewa. Inclusion criteria for the risk group (cases) included, engaging in agricultural activities for more than 5 years and exposure to sunlight for more than 5 hours per day. The control group did not engage in agricultural work and had minimal exposure to sunlight. Sample size of the study was 61 (32 risk group and 29 control group). Early morning urine samples were collected from the participants and tested for total protein with both 25% SSA and pyrogallol red (PGR), albumin, creatinine, osmolality and specific gravity.

Results

Pearson correlation between 25% SSA and PGR protein/creatinine (PCR) ratios were r = 0.867, r = 0.827, P <0.001 in risk and control groups. Spearman correlation between SSA PCR and albumin/creatinine (ACR) was satisfactory (r = 0.716, P <0.001, r = 0.545, P <0.01) in risk and control group. In Pearson correlation statistics, coefficient for SSA PCR vs osmolality were r = -0.566 and -0.571 and further, for SSA PCR vs specific gravity r = -0.533 and -0.619 for risk and control groups respectively (P <0.01) which was significant at P <0.01 level (two tailed).

Conclusion

The performance of 25% SSA test is comparable to that of PGR PCR and ACR in a population living at risk of CKDu. A significant negative correlation was shown by SSA PCR with urine osmolality and specific gravity.

Keywords

Proteinuria, sulfosalicylic acid test, urine osmolality

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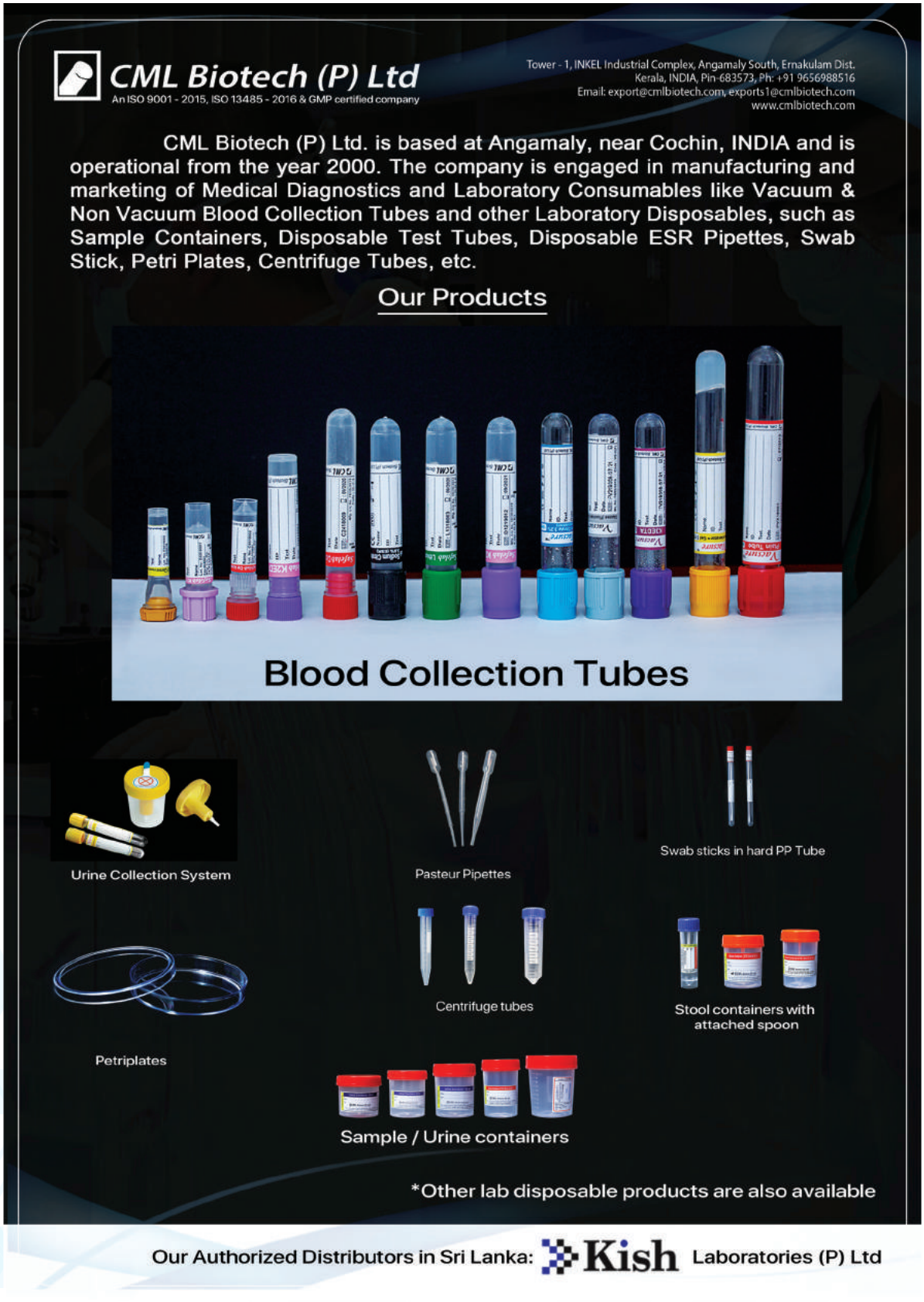
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