المؤتمر الدولي الرابع للكيمياء السريرية والمختبرات الطبية

4TH INTERNATIONAL MEETING ON CLINICAL CHEMISTRY AND LABORATORY MEDICINE

الجمعية تحت إشراف

الهيئة السعودية للتخصصات الصحية
Saudi Commission for Health Specialties

المؤتمر السنوي الثامن

للجمعية السعودية للكيمياء السريرية

8TH ANNUAL CONFERENCE SAUDI SOCIETY FOR CLINICAL CHEMISTRY

CROWNE PLAZA
RDC, RIYADH

Hybrid Meeting

6~8 DEC, 2022

ABSTRACT BOOK

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Introduction and Welcome

Dear Colleagues,

We are pleased to host the 4th International Meeting in Clinical Chemistry & Laboratory Medicine and 8th Annual Meeting Saudi Society for Clinical Chemistry with an education and scientific programs paired with industry workshops from 6th – 8th December 2022.

The meeting is designed to meet the needs of laboratory Physicians, Supervisors, Directors, and Managers, as well as pathologists and other laboratory professionals overseeing or carrying out Clinical Chemistry, Toxicology, Clinical Pathology and Point-of-Care Testing.

The scientific program features experts from International Federation of Clinical Chemistry and Laboratory Medicine, Canada, Australia, Europe, the Middle East and Saudi Arabia, sharing recent advances and innovations. Scientific conference attendees will listen and network with experts in the field and engage with their peers for a unique learning experience. Furthermore, the scientific program will feature the latest updates of clinical testing including:

- Pre-conference workshop on Toxicology dedicated for workplace drug testing and workshop on POCT with special emphasis on setting up training, competency program, and the latest guidelines on the use of POC for fertility and reproduction.
- Keynote presentation on the impact of laboratory medicine in public health, biomarkers of diseases, clinical research, laboratory management, quality and general chemistry, and special sessions dedicated to low carbs and its impact on health.
- Dedicated session for young scientist and poster presentation
- Industry workshop including: Automation, POCT, Novel biomarkers of diseases, advances in analytical techniques, and the use of artificial intelligence (AI) in the laboratory.

The meeting is a learning and sharing platform for all laboratory workers to advance professionally and develop solution for daily practice in the laboratory. We would like to take this opportunity to extend our gratitude to the Saudi Commission for Health Specialties, our speakers, and moderators for their support to Saudi Society for Clinical Chemistry. We also like to offer special thanks to our sponsors for their participation and support for the conference.

On behalf of Saudi Society for Clinical Chemistry, we wish you a successful meeting and look forward seeing you again in 2023.

Dr. Samia H. Sobki
SSCC President

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2018 -2022

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Scientific Speakers-Pre-Conference Workshop

- **DR AHMED AL-ASMARI,** *President of Saudi Scientific Working Group for Forensic Toxicology, KAH, Jeddah*
- **PROF. ABDERRAZEK HEDHILI,** *Professor of Toxicology, University of Pharmacy of Monastir -Tunisia*
- **DR. FAROUQ ALZAHRANI,** *Director of forensic medicine and laboratories, Presidency of State Security*
- **MR. AMJAD ASEERI,** *Head of Toxicology Department, Presidency of State Security*
- **MR. ALI AL-GHAMDI,** *Lab Specialist, King Khalid Hospital, Ministry of National Guard Health Affair, Al-Jeddah*
- **DR ABDULAZIZ ALDLGAN,** *President of the Toxicology Committee at Medical Service Division, SFH, Riyadh*
- **DR. NAFILA ALRIYAMI,** *Senior Consultant in Clinical Biochemistry Department, Sultan Qaboos University Hospital, Oman*
- **MS. SALMA ALSAYED,** *Medical Technologist, Path. & Lab. Med. Dept., PMBA Hospital, NGHA, Medina*
- **MR. ABDULAZIZ ALDUBAYYAN,** *SMLSO, King's College London/Toxicology Division. at PSMMC, Riyadh*
- **MR. ABDUL-RAHMAN ASSIRI,** *Lab Specialist, Assir Poison Control and Forensic Medical Chemistry Center, Abha*
- **DR. MAHA ALMAZROUA,** *Director of Dammam Regional Poison Control Center*
- **DR. FAWAZ SALEH ALBLOUI,** *Lab Manager & Clinical Biochemistry Section Head, Security Forces Hospital, Riyadh*
- **DR. MALAK AL MASHALI,** *Head of POCT Division, CML&BB Dept., Prince Sultan Military Medical City, Riyadh*
- **MS. NAJWA ADLAN,** *Core Lab and Blood Bank Supervisor, Al Dara Hospital & Medical Center, Riyadh*
- **DR. HEBA SALEH KARY,** *Consultant Chemical Pathology, KFSH&RC, Madinah*

Industry Speaker-Pre-Conference Workshop

- **Mr. Steve Carey,** *Marketing Lead - POC Cardiac Siemens Healthineers, GBI*

Scientific Speakers Day-1

- **PROF. KHOSROW ADELI,** *IFCC President, Head of Clin. Biochem., The Hospital for Sick Children, Toronto, Canada*
- **A/PROF. KEN SIKARIS,** *Director of Chemical Pathology, Melbourne Pathology, Melbourne, Australia*
- **DR. LAILA ABDEL-WARETH,** *Acting Executive Director, National Reference Lab/Cleveland Clinic, Abu Dhabi, UAE*
- **DR. MANAL AL KINDI,** *Senior Consultant Chemical Pathologist, Oman Medical Specialty Board Royal Hospital, Oman*
- **DR. ANWAR BORAI,** *Clinical Scientist and Associate Professor, King Abdulaziz Medical City, Jeddah*
- **DR. YAS AL HADEETHI,** *Professor of Applied Physics, King Abdulaziz University, Jeddah*
- **PROF. SUHAD BAHIJRI,** *Professor of Clinical Biochemistry, King Abdulaziz University, Jeddah*

Industry Workshop Speakers Day-1

- **MR. RANIE BESISOU,** *Medical Affairs Manager Roche Diagnostics, Saudi Arabia*
- **DR. CLAUS PRUEMPER,** *Franchise Head Plasma Protein Testing Siemens Healthineers, Marburg*
- **DR. SAMAH KHALED JEMAA,** *Marketing Manager, Abbott Diagnostic, Riyadh, KSA*
- **MR. AHMED TAMIM,** *Automation & IT Manager Beckman Coulter, Riyadh, KSA*
- **DR. JAMES LAST,** *Lead of International Medical Science Liaison, The Binding Site Group Limited, UK*
- **MR. MAHMOUD ZAGHLOUL**, *Thermo Fisher Scientific, Business Development Manager, CDD, Saudi Arabia*
- **DR. FRANK KÜHLWEIN,** *Head of International Sales, Chromsystems GmbH, Munich, Germany*
- **DR. MARCIN PACEK,** *Senior Director of Medical and Scientific Affairs, Europe Nova Biomedical*

Scientific Speakers Day-2

- **DR. LAILA ABDEL-WARETH,** *Acting Executive Director, National Reference Lab/Cleveland Clinic, Abu Dhabi, UAE*
- **DR. NASHAT NAFOURI,** *Chair of Healthcare Interest Group & Executive Officer, Medical & Quality Director Futurelab*
- **MR. KHALID AL ZAHRANI,** *Operations Administrator, Laboratory Services, King Abdulaziz Medical City, Riyadh*
- **A/PROF. KENNETH SIKARIS,** *Director of Chemical Pathology, Melbourne Pathology, Melbourne, Australia*
- **DR. AMMAR TONKAL,** *Medical Doctor, Lifestyle Medicine Clinic, Mira Gulf Clinic, Jeddah, KSA*
- **MR. RAYYAN AL-SULAIMANI,** *Laboratory Technologist King Abdullah Medical City (KAMC), Makkah Al-Mokarramah,*
- **DR. ABDULHADI BIMA,** *Chemical Pathology Consultant King Abdul-Aziz University Hospital, Jeddah, KSA*
- **PROF. SUHAD BAHIJRI,** *Professor of Clinical Biochemistry, King Abdulaziz University, Jeddah, KSA*
- **DR. MANAL AL KINDI,** *Senior Consultant Chemical Pathologist, Oman Medical Speciality Board Royal Hospital, Oman*
- **DR. NAFILA ALRIYAMI,** *Senior Consultant in Clinical Biochemistry Department, Sultan Qaboos University Hospital, Oman*
- **DR. WALEED TAMIMI,** *Head of Clinical Chemistry Lab, King Abdulaziz Medical City, Riyadh, KSA*
- **DR. FADEL AL HABABI,** *Head of Virology Department, Regional Lab and Blood Bank, Riyadh, KSA*
- **DR. DUAA MOHAMMED ALAHDAL,** *Consultant Medical Biochemist KAAUH, PNU, Tiabah University, Madinah, KSA*

Moderators

- **DR AHMED AL-ASMARI,** *President of Saudi Scientific Working Group for Forensic Toxicology, KAA Hospital, Jeddah*
- **DR. MANSOUR AHMED ALZAHRANI,** *Director of Poison Control and Forensic Chemistry Center*
- **DR. MALAK AL MASHALI,** *Head of POCT Division, CML&BB Dept., Prince Sultan Military Medical City, Riyadh*
- **MS. NAJWA AL ADLAN,** *Core Lab and Blood Bank Supervisor, Al Dara Hospital & Medical Center, Riyadh*
- **DR. SAMIA HASSAN SOBKI,** *SSCC President*
- **DR. ABDULHADI BIMA,** *Chemical Pathology Consultant King Abdul-Aziz University Hospital, Jeddah*
- **DR. WALEED AL OMAIM,** *Consultant Chemical Pathology, King Faisal Specialist Hospital & Research Center, Riyadh*
- **PROF. ZUHEIR AWAN,** *SSCC Administrative Board Member*
- **PROF. KHALID AL HARBI,** *Professor and Consultant in Medical Molecular Genetics in King Saud University*
- **DR. ABDULLAH TURJOMAN,** *Consultant Clinical Biochemist, Prince Muhammad bin Abdulaziz Hospital (PMAH), Riyadh*
- **MR. ZAED ASIRI,** *CML&BB Dept. Prince Sultan Military Medical City, Riyadh*
- **DR. ALI AL OTHAIM,** *SSCC Vice President*
- **DR. ANWAR BORAI,** *Clinical Scientist and Associate Professor, King Abdulaziz Medical City, Jeddah*
- **DR. WALEED AL TAMIMI,** *Head of Clinical Chemistry Lab, King Abdulaziz Medical City, Riyadh*
- **PROF. RANA HASANATO,** *College of Medicine, King Saud University, Riyadh*
- **DR. SUMAYA ALJENDIL,** *Quality Medical Director, DPLM, King Faisal Specialist Hospital and Research Center, Riyadh*
- **DR. ABDULLAH AL SHEHRI,** *Head of Biochemical Genetics & Toxicology, PCLMA, King Fahad Medical City, Riyadh*
- **DR. SALAM SAADEDDIN,** *SSCC Chairperson Scientific Committee and Administrative Board Member*

Scientific Program

PRE-CONFERENCE WORKSHOP: Tuesday, 6th December 2022

Toxicology Workshop

TIME	TOPICS	SPEAKER
8:00 am – 8:10 am	**Registration**	
SESSION-1 **TOXICOLOGY: Workplace Drug Testing** **Moderators:** **Dr. Ahmed Al-Asmari,** *President of SSWGTOX, King Abdul-Aziz Hospital, Jeddah, KSA* **Dr. Mansour Ahmed Alzahrani,** *Director of Poison Control and Forensic Chemistry Center*		
8:10 am – 8:25 am	Workplace Drug Testing in the Kingdom of Saudi Arabia: An Introduction	**Dr. Ahmed Al-Asmari** *President of Saudi Scientific Working Group for Forensic Toxicology (SSWGTOX)* *King Abdul-Aziz Hospital, Jeddah, KSA*
8:25 am – 8:50 am	Toxicological Emergencies: Analytical, Therapeutic and Preventive Roles of Toxicological Analysis Laboratories	**Prof. Abderrazek Hedhili** *Professor of Toxicology* *University of Pharmacy of Monastir -Tunisia*
8:50 am – 9:20 am	Issues in the Workplace Drug Testing: Challenging and Proposed Resolutions with Focus on Chain of Custody and Cut-Offs	**Dr. Farouq Alzahrani &** **Mr. Amjad Aseeri** *Medical Department at Presidency of State Security*
9:20 am – 9:40 am	Urine Adulteration & Validity Testing in Workplace Drug Testing Screening	**Mr. Ali Al-Ghamdi** *Pathology and Laboratory Department* *King Khalid Hospital, Ministry of National Guard Health Affair, Jeddah, KSA*
9:40 am – 10:00 am	**C o f f e e B r e a k**	
10:00 am – 10:20 am	Stability of Drug of Abuse in Urine Samples Tested for Workplace Drug Testing	**Dr. Abdulaziz Aldlgan** *Section Head of Toxicology Lab at Security Forces Hospital, Riyadh, KSA*
10:20 am – 10:40 am	Patterns of Drug Abuse in GCC/ MENA Region: Single tertiary care experience in Oman as an example	**Dr. Nafila Bazdawi Alriyami** *Senior Consultant in Clinical Biochemistry Dept., Sultan Qaboos University Hospital, Oman*
10:40 am – 10:55 am	Accreditation of Toxicology Testing related To Workplace Drug Testing	**Ms. Salma Alsayed** *Pathology and Laboratory Department* *Prince Mohammed Bin Abdul-Aziz Hospital, Ministry of National Guard Health Affair, Al-Madinah, KSA*
10:55 am – 11:10 am	Overview of Different Matrices in Workplace Drug Testing	**Mr. Abdulaziz Aldubayyan** *Faculty of Health Science & Medicine, King's College London, London, UK* *Toxicology Department, Prince Sultan Military Medical City, Ministry of Defence, Riyadh, KSA*
11:10 am – 11:25 am	Workplace Drug Testing for Civilian Employees	**Mr. Abdul-Rahman Assiri** *Assir Poison Control and Forensic Medical Chemistry Centre, Ministry of Health, Abha, KSA*
11:25 am – 11:50 am	The Role of Online Toxicology Analysis Request and Reports (OTARR) Approach in Ministry of Health in advancing Workplace Drug Testing in the Kingdom of Saudi Arabia	**Dr. Maha Almazroua** *Pharm. Toxicologist & Forensic sciences Sp.* *DPCC Director, Founder of the 1st National tox. database & Platform*
11:50 am – 12:10 pm	Panel Discussion and Conclusion	
12:10 pm – 1:30 pm	**L u n c h a n d P r a y e r s**	

Scientific Program

PRE-CONFERENCE WORKSHOP -Tuesday, 6th December 2022

Toxicology Workshop

TIME	TOPICS	SPEAKER
SESSION-2 **POINT-OF-CARE TESTING (POCT)** **Moderators:** **Dr. Malak Al Mashali**, *Head of POCT Division, Central Military Laboratory & Blood Bank Dept., PSMMC, Riyadh,* **Ms. Najwa Al Adlan**, *Core Lab and Blood Bank Supervisor, Al Dara Hospital & Medical Center, Riyadh*		
1:30 pm – 1:55 pm	Introduction Point-of- Care Testing (POCT) Program	**Dr. Fawaz Saleh Albloui** *Clinical Biochemistry Consultant, Laboratory & POCT Manager, Pathology & Laboratory Medicine, Security Forces Hospital, Riyadh*
1:55 pm – 2:20 pm	Setting a training and competency program for POCT users	**Dr. Malak Al Mashali** *Head of POCT Division, Central Military Laboratory & Blood Bank Dept., Prince Sultan Military Medical City, Riyadh, KSA*
2:20 pm – 2:45 pm	Assessing POCT practice in Saudi - Survey Results.	**Ms. Najwa Adlan** *Core Lab and Blood Bank Supervisor* *Al Dara Hospital & Medical Center, Riyadh*
2:45 pm – 3:10 pm	AACC Guidance on the use of POCT in fertility & Reproduction	**Dr. Heba Saleh Kary** *Consultant Chemical Pathology* *KFSH&RC - Madinah*
3:10 pm – 3:25 pm	Quality Improvement Program Experience in PSMMC	**Dr. Malak Al Mashali** *Head of POCT Division, Central Military Laboratory & Blood Bank Dept., Prince Sultan Military Medical City, Riyadh, KSA*
3:25 pm – 3:30 pm	Panel Discussion	
	POCT Industry Presentation	
3:30 pm – 3:45 pm	High Sensitivity Troponin Testing at the Point of Care	**Mr. Steve Carey** *Marketing Lead - POC Cardiac* *Siemens Healthineers, GBI*

Scientific Program

DAY-1 Schedule (CONFERENCE) - Wednesday, 7th December 2022

TIME	TOPICS	SPEAKER
7:30 am – 8:00 am	**Registration**	
8:00 am – 8:15 am	Conference Opening	**Dr. Samia Hassan Sobki** *SSCC President*
SESSION-3 **KEYNOTE LECTURE** **Moderator:** **Dr. Samia Hassan Sobki,** *SSCC President*		
8:15 am – 9:00 am	Central Role and Impact of Laboratory Medicine in Public Health and Healthcare Delivery	**Prof. Khosrow Adeli** *President, International Federation of Clinical Chemistry and Laboratory Medicine (IFCC)*
SESSION-4 **CLINICAL CHEMISTRY** **Moderators:** **Dr. Abdulhadi Bima,** *Chemical Pathology Consultant King Abdul-Aziz University Hospital, Jeddah, KSA* **Dr. Waleed Al Omaim,** *Consultant Chemical Pathology, DPLM, King Faisal Specialist Hospital & Research Center, Riyadh*		
9:00 am – 9:30 am	Distinguishing Chronic Kidney Disease with Pathology Tests	**A/Prof Kenneth Andrew Sikaris** *Director of Chemical Pathology, Melbourne Pathology, Melbourne, Australia*
9:30 am – 10:00 am	Cardiometabolic Syndrome: Pathogenesis and Biochemical Markers	**Dr. Laila Abdel-Wareth** *Acting Executive Director* *National Reference Lab/Cleveland Clinic* *Abu Dhabi, UAE*
10:00 am – 10:30 am	Hyperaldosteronism Case Based Discussion and Update Objectives	**Dr. Manal Al Kindi** *Senior Consultant Chemical Pathologist, Clinical Lipidiologist, Oman Medical Speciality Board Royal Hospital*
10:30 am – 10:40 am	Questions and Answers	
10:40 am – 11:00 am	**C o f f e e B r e a k**	
SESSION #5 **CLINICAL RESEARCH** **Moderators:** **Prof. Zuheir Awan,** *SSCC Administrative Board Member* **Prof. Khalid Al Harbi,** *Professor and Consultant in Medical Molecular Genetics in King Saud University*		
11:00 am – 11:25 am	Ethics in Clinical Research: History & Principles	**Dr. Anwar Borai** *Clinical Scientist and Associate Professor* *King Abdulaziz Medical City- Jeddah,*
11:25 am – 11:55 am	Thoughts to Success in Scientific Research	**Dr.Yas Al Hadeethi** *Professor of Laser Physics* *Head of Lithography in Device Fabrication and Development Research Group, DSR, KAU*
11:55 am – 12:20 pm	How to Get a Paper Published in an Academic Journal	**PROF. SUHAD BAHIJRI** *Professor of Clinical Biochemistry and Head of Saudi Diabetes Research Group* *King Abdulaziz University, Jeddah-KSA*
12:20 pm – 12:30 pm	Questions and Answers	
12:30 pm – 1:30 pm	**L u n c h a n d P r a y e r s**	
1:30 pm – 2:30 pm	**P o s t e r T o u r**	

Scientific Program

DAY-1 Schedule (CONFERENCE) – Wednesday, 7th December 2022

TIME	TOPICS	SPEAKER
SESSION-6 **INDUSTRY WORKSHOP** **Moderators:** **Dr. Abdullah Turjoman,** *Consultant Clinical Biochemist, Prince Muhammad bin Abdulaziz Hospital (PMAH), Riyadh* **Mr. Zaed Ahmed Asiri**, *CML&BB Dept, Prince Sultan Military Medical City, Riyadh*		
1:30 pm – 1:50 pm	The clinical role of sflt-1/PlGF as biomarkers in the aid of the early diagnosis of Preeclampsia	**Mr. Ranie Besisou** *Medical Affairs Manager* *Roche Diagnostics, Saudi Arabia*
1:50 pm – 2:10 pm	Advances in nephelometry in renal disease management	**Dr. Claus Pruemper** *Franchise Head Plasma Protein Testing* *Siemens Healthineers, Marburg*
2:10 pm – 2:30 pm	Laboratory Biomarkers in Autoimmune Disease Diagnosis and Monitoring	**Prof. Khosrow Adeli** *President, IFCC,* *Head, Clinical Biochemistry, Paediatric Laboratory Medicine* *The Hospital for Sick Children, Toronto, Canada*
2:30 pm – 2:50 pm	Artificial Intelligence in The Clinical Decision	**Dr. Samah Khaled Jemaa** *Marketing Manager* *Abbott Diagnostic, Riyadh, KSA*
2:50 pm – 3:05 pm	**P r a y e r**	
3:05 pm – 3:20 pm	New Generation of Total Lab Automation	**Mr. Ahmed Tamim** *Automation & IT Manager* *Beckman Coulter, Riyadh, KSA*
3:20 pm – 3:35 pm	The Future of M-component Analysis	**Dr. James Last** *Lead of International Medical Science Liaison* *The Binding Site Group Limited, UK*
3:35 pm – 3:50 pm	Value of Automated Toxicology Screening	**Mr. Mahmoud Zaghloul** *Thermo Fisher Scientific, Business Development Manager, CDD, Saudi Arabia*
3:50 pm – 4:05 pm	Drugs of Abuse: A new IVD LCMSMS assay for screening and confirmation of 108 of the most common illicit drugs	**Dr. Frank Kühlwein** *Head of International Sales* *Chromsystems GmbH, Munich, Germany*
4:05 pm – 4:20 pm	The Importance of Precise and Reliable Glucose and Ketone Measurements in Critical Care Settings	**Dr. Marcin Pacek** *Senior Director of Medical and Scientific Affairs, Europe Nova Biomedical*
4:20 pm – 4:30 pm	***LUCKY DRAW FOR ATTENDEES***	

Scientific Program

DAY 2 Schedule (CONFERENCE) – Thursday, 8th December 2022

TIME	TOPICS	SPEAKER
SESSION #7 **LABORATORY MANAGEMENT** **Moderators:** **Dr. Ali Al Othaim,** *SSCC Vice President* **Dr. Anwar Borai,** *Clinical Scientist and Associate Professor, King Abdulaziz Medical City, Jeddah*		
8:30 am – 8:55 am	Hitchhikers Guide to Next Generation Leadership	**Dr. Laila Abdel-Wareth** *Acting Executive Director* *National Reference Lab/Cleveland Clinic* *Abu Dhabi, UAE*
8:55 am – 9:20 am	The Triangle of Success for Future Laboratories: The 3 Cs and I Model	**Dr. Nashat Nafouri** *Chair of Healthcare Interest Group & Executive Officer (SQC) / Medical & Quality Director Futurelab*
9:20 am – 9:45 am	The Laboratory Between Leadership and Management	**Mr. Khalid Mohammed Al Zahrani** *Operations Administrator, Laboratory Services, King Abdulaziz Medical City, MNGHA*
9:45 am – 9:55 am	Questions and Answers	
9:55 am – 10:05 am	**C o f f e e B r e a k**	
SESSION #8 **LOW CARB SOCIETY** **Moderator:** **Dr. Waleed Al Tamimi,** *Head of Clinical Chemistry Lab, King Abdulaziz Medical City, Riyadh* ❖ **Prof. Rana Hasanato,** *College of Medicine, King Saud University, Riyadh*		
10:05 am – 10:35 am	Pathology Testing Explains The Impact Of Diet On Cardiovascular Risk	**A/Prof Kenneth Andrew Sikaris** *Director of Chemical Pathology, Melbourne Pathology, Melbourne, Australia*
10:35 am – 11:00 am	Hepatic and Extrahepatic Insulin Resistance and its Clinical Significance	**Dr. Ammar Abdulkader Tonkal** *Medical Doctor, Lifestyle Medicine Clinic* *Mira Gulf Clinic, Jeddah KSA*
11:00 am – 11:25 am	Current Method to Measure Insulin Resistance	**Mr. Rayyan Ali Al-Sulaimani** *Laboratory Technologist King Abdullah Medical City (KAMC), Makkah Al-Mokarramah, KSA*
11:25 am – 11:50 am	Insulin resistance! How to reverse it?	**Dr. Abdulhadi Ibrahim Bima** *Chemical Pathology Consultant King Abdul-Aziz University Hospital, Jeddah KSA*
11:50 am – 12:00 pm	Questions and Answers	
12:00 pm – 1:00 pm	**L u n c h a n d P r a y e r s**	
1:00 pm – 2:00 pm	**P o s t e r T o u r**	

Scientific Program

DAY 2 Schedule CONFERENCE - Thursday, 8th December 2022

SESSION #9 **GENERAL CHEMISTRY** **Moderators:** **Dr. Sumaya Aljendil,** *Quality Medical Director, DPLM, KFSHRC, Riyadh* **Dr. Abdullah Al Shehri,** *King Fahad Medical City, Riyadh*		
1:00 pm – 1:20 pm	Glycated Albumin as an alternative to Glycated Hemoglobin for the diagnosis and monitoring of Dysglycemia	**Prof. Suhad Bahijri** *Professor of Clinical Biochemistry and head of Saudi Diabetes Research Group* *King Abdulaziz University, Jeddah-KSA*
1:20 pm – 1:40 pm	Unravelling the Non-HDL-C Story	**Dr. Manal Al Kindi** *Senior Consultant Chemical Pathologist, Clinical Lipidiologist, & Program Director-Clinical Biochemistry Program, Oman Medical Speciality Board Royal Hospital*
1:40 pm – 2:00 pm	Interferences in Laboratory Tests : An Old and Recurring Problem	**Dr. Nafila Bazdawi Alriyami** *Senior Consultant in Clinical Biochemistry Department, Sultan Qaboos University Hospital, Oman*
2:00 pm – 2:20 pm	Importance of the Preanalytical Phase in different areas of the Laboratory	**Dr. Waleed Tamimi** *Head of Clinical Chemistry Lab* *King Abdulaziz Medical City, Riyadh, KSA*
2:20 pm – 2:40 pm	Clinical Application of Herpes Simplex Virus Infection	**Dr. Fadel Al Hababi** *Head of virology Department* *Regional Lab and Blood Bank, Riyadh, KSA*
2:40 pm – 3:00 pm	Procalcalcitonin and Its Role in Patients with Covid-19	**Dr. Duaa Mohammed Alahdal** *Consultant Medical Biochemist KAAUH, PNU* *Assistant Professor Tiabah University, Madinah, KSA*
3:00 pm – 3:10 pm	**Questions and Answers**	
SESSION #10 **GENERAL EVENTS** **Moderators:** **Dr. Ali Al Othaim,** SSCC Vice President **Dr. Salam Saadeddin,** *SSCC Chairperson Scientific Committee and Administrative Board Member*		
3:10 pm – 3:25 pm	General Assembly	**Dr. Samia Sobki** *SSCC President*
3:25 pm – 3:40 pm	Award Presentation	**Dr. Salam Saadeddin** *SSCC Chairperson of the Scientific Committee*
3:40 pm – 3:55 pm	Sponsor Appreciation	**Dr. Waleed Al Tamimi** *Head of Clinical Chemistry Lab,* *King Abdulaziz Medical City, Riyadh, KSA* **Dr. Ali Al Othaim** *SSCC Vice President*
3:55 pm – 4:10 pm	**Closing Remarks**	**Dr. Samia Sobki** *SSCC President*

Scientific Oral Presentation Abstracts

WORKPLACE DRUG TESTING IN THE KINGDOM OF SAUDI ARABIA: AN INTRODUCTION

Dr Ahmed Al-Asmari

President of Saudi Scientific Working Group for
Forensic Toxicology (SSWGTOX)
King Abdul-Aziz Hospital, Jeddah

Throughout the history of drug abuse analysis, no doubt, it is a necessary means of saving human lives. The side effects of illicit drug use have influenced public safety; crime rates, for example, have increased due to the use of these drugs. Therefore, companies and industries have conducted workplace drug testing (WDT) as a tool to screen job applicants. In addition, rising public concern on the harmful effects of drug abuse causes a sharp increase in the use of WDT. Conversely, the use of adulteration products has increased severely because of the growing demand in the public and private sectors for a drug-free work environment. Adulterations have threatened the reliability of drug testing. The accuracy of drug tests is often questioned because these chemicals can manipulate urine samples and cause false negative results in WDT. This workshop will examine different points of view that have resulted from this. Some of the responses that have been put forward will then be evaluated, and it will be suggested that the argument in favor of suitable detection methods to avoid false negative results is a persuasive one. Saudi Arabia is one of the leading countries in the world that WDT is mandatory for new employees. In military personal regular WDT is conducted.

Scientific Oral Presentation Abstracts

ANALYTICAL, THERAPEUTIC AND PREVENTION OF TOXICOLOGICAL EMERGENCIES

Prof. Abderrazek Hedhili

Pr Hospitalo-universitaire en Toxicologie
D.G Direction dela Pharmacie et du Médicament (DPM)

According to the Chemical Abstract, several million chemicals are identified each year and can be potentially toxic depending on the doses consumed, ingested, inhaled and/or injected. These toxins or xenobiotics can be: drugs, plants, mushrooms, pesticides, solvents, toxic gases, caustics, envenomations, poisonous fish, biotoxins, or mycotoxins. The toxicity of these products is either lightning super acute (cyanides), acute or chronic (lead, cadmium, mercury…), voluntary, accidental, suicidal, criminal, professional, environmental, domestic. Voluntary acute poisoning is a frequent cause of hospitalization. In Tunisia and around the world, emergency services record numerous poisonings with various products every day. The diversity and complexity of these poisonings require the emergency physician to adopt a particular behaviour (attitude) during their clinical, therapeutic, diagnostic and prognostic management and requiring. This intervention treat the toxicological emergency, toxidroms, biological perturbations and the contribution of Toxicology laboratory and analytical approaches: biological matrix (advantages and disadvantages), methods of analysis, results, interpretation and their impact on the treatment, prognostic, prevention.

Scientific Oral Presentation Abstracts

ISSUES IN THE WORKPLACE DRUG TESTING: CHALLENGING AND PROPOSED RESOLUTIONS WITH FOCUS ON CHAIN OF CUSTODY AND CUT-OFFS

Dr Farouq Alzahrani & Mr. Amjad Aseeri

Medical Department at Presidency of State Security

Today, in military sites within the kingdom, taking a drug test is as routine as filling out a job application. Workplace drug testing (WPDT) is carried out for many purposes including: promotion, pre-employment, suspicious behaviour, accidents, absence from work with no acceptable excuse, or random. Due to the critical consequences on reputation and the severe penalties for those who their samples tested positive, it is very important that all procedures related to sample collection, testing, and results reporting to be robust so that no errors will occur. Toxicology labs, either the once do the screening or confirmatory analysis, are facing several challenges including: 1) Lack of legislation and detailed work guidelines for all stages of the examination. 2) Lack of control over the performance of laboratories. 3) Commitment to the ethics of medical work and maintaining the privacy of those subject to the examination. 4) The absence of scientific societies specialized in this field.

Scientific Oral Presentation Abstracts

URINE ADULTERATION & VALIDITY TESTING IN WORKPLACE DRUG TESTING SCREENING

Mr. Ali Al-Ghamdi

Pathology and Laboratory Department, King Khalid Hospital
Ministry of National Guard Health Affair, Al-Jeddah, SA

Specimen validity testing is an important part of every urine drug test. It provides clinicians with critical information about the accuracy and reliability of drug test results, and that the specimen submitted is a valid human urine specimen. Laboratories that specialize in urine drug testing often have established specimen validity testing protocols and toxicologists in place in order to assist with report interpretation.[7] For the practitioner who has concerns regarding drug abuse or non-compliance, these specimen validity tests can also provide scientific results that, when coupled with other indicators , may assist with the initiation of a conversation regarding potential drug abuse, mismanagement of medications, or diversion of prescribed drugs.

Scientific Oral Presentation Abstract

STABILITY OF DRUG OF ABUSE IN URINE SAMPLES TESTED FOR WORKPLACE DRUG TESTING

Dr Abdulaziz Aldlgan

President of the Toxicology Committee at Medical Services Division at Saudi Ministry of Interior
Section Head of Toxicology Lab at Security Forces Hospital, Riyadh, KSA

Stability is an important consideration in the use of specimens for accurate determination of analyte concentrations. Effective urine drug of abuse testing requires an understanding of the stability of drugs and their metabolites excreted in the urine matrix. As timing of specimen collection is crucial in urine screening of drugs, potential degradation that may occur between, e.g., the initial test and the re-test of samples, should be considered. Stability characteristics depend on the drug, specimen's pH, storage temperature, light exposure, bacteria contamination and material of the urine container. The main objectives of the lecture is to assess the stability of some drugs of abuse (e.g. methamphetamine, amphetamine, cannabinoids, opioids, cocaine, benzodiazepines and ethanol) tested for Workplace Drug Testing in urine samples kept at room temperature, refrigerated and frozen conditions.

Scientific Oral Presentation Abstract

PATTERNS OF DRUG ABUSE IN GCC/ MENA REGION
SINGLE TERTIARY CARE EXPERIENCE IN OMAN AS AN EXAMPLE

Dr. Nafila Bazdawi Alriyami

Senior Consultant in Clinical Biochemistry Department
Sultan Qaboos University Hospital, Oman

Illicit drug use is on the rise both locally and globally. Various social, economic and political factors have contributed to this very noticeable and unfortunate trend. In some recent surveys, the abuse of illicit drugs in the MENA (Middle East and North Africa) region has risen by 79% and by 39 % in the GCC (Gulf Cooperation Council). Many drug abusers present to the ED (Emergency Department) with various clinical presentations as a result of illicit drug overdose. This creates a significant challenge for physicians and pathologists alike on the clinical front. This talk attempts to look at the various patterns of drug abuse within the region and the role of the lab/ chemical pathologist in identifying some of these illicit drugs, communicating with treating physicians and the development of suitable fit – for-use drug screening panels.

Scientific Oral Presentation Abstract

ACCREDITATION OF TOXICOLOGY TESTING RELATED TO WORKPLACE DRUG TESTING: MINISTRY OF NATIONAL GUARD OVERVIEW

Ms. Salma Alsayed

Pathology and Laboratory Department
Prince Mohammed Bin Abdul-Aziz Hospital
Ministry of National Guard Health Affair, Al-Madinah, KSA

Pathology and Laboratory Medicine Departments at Prince Mohammed Bin Abdulaziz Hospital is one of the laboratory that is accredited by the Saudi Central Board for Accreditation of Healthcare Institutions(CBAHI), College of American Pathologists (CAP) and International Organization for Standardization (ISO 15189, A2LA). All of the accreditation requirements are met for all lab testing including toxicology testing related to workplace drug testing. The lab is providing a service for toxicology drug screening testing. The College of American Pathologists (CAP) provides a roadmap tool from application to accreditation, and support laboratory needs to understand and successfully complete each step on the accreditation journey. Forensic drug testing accreditation program is designed for the unique needs of forensic drug testing laboratories and intended for laboratories that perform screening and confirmatory testing on urine, oral fluid, hair, nail, meconium, umbilical cord, and whole blood by non-waived methods. Accreditation checklists provide a clear roadmap for not only achieving accreditation but also for running a high-quality laboratory. Since the checklists are organized by discipline, they are easy to assign to staff, helping to simplify inspection preparation process. Prior to an inspection, CAP is creating a custom checklist specifically for laboratory based on the exact testing menu.

Scientific Oral Presentation Abstract

OVERVIEW OF DIFFERENT MATRICES IN WORKPLACE DRUG TESTING

Abdulaziz Al Dubayyan

Department of Analytical, Environmental and Forensic Science, Faculty of Health Science & Medicine, King's College London, London, UK
Toxicology Division, Prince Sultan Military Medical City, Ministry of Defense, Riyadh, KSA

Workplace drug testing program is intended to identify illicit drug use by employees or job applicants in order to reduce accidents and to promote a safer working environment for all. Urine is the most commonly utilized biological sample by workplace drug testing laboratories, which enables drug detection within few days of intake. With the remarkable advances in analytical techniques, a wide variety of untraditional matrices have been used for the purposes of workplace of drug testing. Each can deliver valuable evidence concerning past or recent drug use. For example, the use of oral fluid has been found to reflect very recent impairment, whilst hair testing allows identification of long-term drug use owing to their wider window of detection. This presentation provides an overview of different matrices within the context of workplace drug testing.

Scientific Oral Presentation Abstract

WORKPLACE DRUG TESTING FOR CIVILIAN EMPLOYEE

Mr. Abdul-Rahman Assiri

Assir Poison Control and Forensic Medical Chemistry Centre, Ministry of Health, Abha, KSA

Illicit drug abuse is a worldwide real threat. It profoundly impacts both individual and community. This negative effect gets reflected on the socio-behavioral construct and economical integrity of any environment, which in-turn creates a huge governmental burden. Drug testing of the pre-employment would help to mitigate the risks and problematic outcomes of hiring an illicit drug abuser. Moreover, workplace drug testing (WPDT) is a prevention and deterrent method to guarantee drug-free environment, thus will improve the employee's morality, productivity, and performance and also will decreased absenteeism, accidents, downtime and erroneous actions. In this article, three main points will be covered: a brief comment on the statistics of the pre-employment drug testing program in MOH, the relationship between illicit drugs abuse and vulnerability, and a new proposal of more comprehensive workplace drug testing program.

Scientific Oral Presentation Abstract

THE ROLE OF ONLINE TOXICOLOGY ANALYSIS REQUEST AND REPORTS (OTARR) APPROACH IN MINISTRY OF HEALTH IN ADVANCING WORKPLACE DRUG TESTING IN THE KINGDOM OF SAUDI ARABIA

Dr. Maha Almazroua

Pharm. Toxicologist & Forensic sciences Sp. DPCC
Director, Founder of the 1st National tox. database &
Platform, EPPC President, GS of STS,VP ATA at SOT;
KSAPT Chairwoman

OTARR – (Online Toxicology Analysis Requests and Results) is a pioneer computerized toxicological application. The development of online computerized medical record database has in general complied with the actual needs and conditions in the modern healthcare system to deal with tremendously medical and medico legal needs. Aim of this lecture is to explain how OTARR provides full automated, controlled work place drug testing service and represents a novel solution for ongoing medico legal problem. Dammam Poison Control Center (DPCC) has medico legal intimate services. Workplace drug testing is one of the most important medico legal services. The results of analysis and consultation should be secured, concise, fast and at the same time comprehensive following the recommended SAMSHA (Substance Abuse and Mental Health Services administration) guidelines. There are many challenges facing workplace drug testing as: information & resources, turnaround time, communication, intact chain of custody, and documentation. OTARR supports the intact traceable electronic chain of custody and control form starting from sampling, transportation, processing, traceability of samples inside the laboratory, reporting and storage. OTARR facilitates WPDT related complaint investigations through root cause analysis and issuance of the corrected report.

Scientific Oral Presentation Abstract

INTRODUCTION POINT-OF- CARE TESTING (POCT) PROGRAM

Dr. Fawaz Saleh Al Bloui

Clinical Biochemistry Consultant, Laboratory & POCT Manager
Pathology & Laboratory Medicine
Security Forces Hospital, Riyadh, KSA

This presentation identifies the roles of point-of-care testing in health care and highlights the benefits of implementing such a program in hospitals. The types of POCT devices and how they are categorized by the FDA and CLIA will be discussed. The implementation of the POCT requires a well-designed plan to improve the accuracy of results, thus improving health care in the organization. Key considerations prior to the implementation of the POCT program will be covered including the responsibilities of the Point of Care Coordinators, POCT Committee and End Users. The presentation highlights quality assurance as it is an essential practice to ensure compliance with national and international regulations. To ensure the consistency of compliance, the POCT program needs to be well monitored and managed especially if the devices are in a far distance to the main laboratory, and this could be accomplished by connecting all POCTs devices to data managers software, LIS or HIS and EMR. Not only the benefits and facility of the POCT will be covered, but also some challenges that could be encountered during the POCT operation will be weighted.

Scientific Oral Presentation Abstract

SETTING A TRAINING AND COMPETENCY PROGRAM FOR POCT USERS

Dr. Malak Al Mashali

Head of POCT Division
Central Military Laboratory & Blood Bank Dept.
Prince Sultan Military Medical City, Riyadh, KSA

Most the staff who perform POCT are not trained laboratory staff and may not be as knowledgeable about the processes involved in POCT testing, such as patient preparation, sample collection, management of equipment and supplies, instrument calibration and maintenance, the performance of the test, quality control, interpretation of the results, and reporting/documentation of results in each patient's context. Therefore, staff performing POCT must have the proper training and experience to ensure test results are accurate and reliable. Construct a training and competency assessment program while differentiating waived and moderate testing competency evaluation requirements with Multidisciplinary team is challenging. This workshop session outlines the specific requirements for staff training based on international standards which need to be considered to ensure the quality of test results and describes competency criteria required for compliance with POCT.

Scientific Oral Presentation Abstract

AACC GUIDANCE ON THE USE OF POCT IN FERTILITY & REPRODUCTION

Dr. Heba Kary

Consultant, Chemical Pathology
Head of Saudi Point-of-Care Testing Association – SPOCTA/SSCC
King Faisal Specialist Hospital & Research Centre
Madinah, Saudi Arabia

As a co-author, I am delighted to announce that AACC has updated guidance that it originally published in 2007 to inform healthcare professionals of the most current best practices for point-of-care testing in reproductive medicine. Highlights of the key recommendations from this document include: 1) Testing for PROM using commercial kits alone is not recommended without clinical signs that a patient's water has broken. Additionally, results from these tests must be interpreted in the context of a patient's clinical presentation to prevent patient harm. 2) Urine luteinizing hormone tests are accurate and reliable predictors of ovulation. These tests can improve the likelihood of conception among healthy fertile women and can also be used to time certain assisted reproduction procedures. However, further study is still needed to determine the efficacy of at-home ovulation prediction kits that use saliva or measure basal body temperature. 3) While blood laboratory pregnancy tests are the gold standard, healthcare providers should consider using pregnancy point-of-care tests in situations where rapid diagnosis of pregnancy is needed for treatment decisions. One such scenario is if a patient presents to the emergency department with unstable vital signs and symptoms indicative of a ruptured ectopic pregnancy that might require surgery.

Scientific Oral Presentation Abstract

STANDARDIZING POCT USER PRACTICE TO IMPROVE BLOOD GAS ANALYSIS SERVICE (A QUALITY IMPROVEMENT PROGRAM EXPERIENCE IN PSMMC)

Dr. Malak Al Mashali

Head of POCT Division, Central Military Laboratory & Blood Bank Dept.
Prince Sultan Military Medical City, Riyadh, KSA

POC blood gas testing delivers rapid and accurate results, allowing assessment of metabolic and respiratory status in critical situations and prompt initiation of treatments. This has led to POC blood gas tests becoming more frequent or even standard options in several care settings. At PSMMC/PSCC there are more than 48-blood gas machines located at 27 sites across the city. We aimed to evaluate the results of key performance indicators (KPIs) for a period of over one year, as well as their effectiveness as an improvement tool, to provide accurate result and improve the quality of the Blood gas service. This quality indicators tools set to Identify and analyze the gap in blood gas testing at POCT settings across all its stages, aiming to improve the testing workflow and to provide better clinical outcomes and minimize the anonymous errors.

Scientific Oral Presentation Abstract

CENTRAL ROLE AND IMPACT OF LABORATORY MEDICINE IN PUBLIC HEALTH AND HEALTHCARE DELIVERY

Prof. Khosrow Adeli

IFCC President,
Division Head of Clinical Biochemistry Dept. of Pediatric Laboratory Medicine
The Hospital for Sick Children, Toronto, Canada

Laboratory medicine is central to healthcare delivery and publica health, providing objective data to healthcare professionals that is integral to inform clinical decision-making, including the prognosis, diagnosis, treatment, and monitoring of patients. Indeed, evidence-based laboratory data is necessary to provide appropriate, effective, and high-quality patient care. Laboratory professionals directly support patient care and public health. While their profession is vital to healthcare, health systems tend to be not aware of their crucial and central role in healthcare delivery. Unfortunately, the field of laboratory medicine has gone without much recognition within healthcare organizations and the public, leading to poor visibility of its essential service.

As President of the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC), with the help of the Executive Board, I have developed a new strategic plan to continue its mission of “advancing excellence in laboratory medicine for better healthcare worldwide”. As part of this plan, IFCC will strongly promote the value of laboratory medicine by gathering evidence to demonstrate the value of lab medicine in healthcare delivery, particularly in the context of clinical decision-making. The evidence gathered from around the world will then be used to promote the critical role of laboratory medicine in healthcare to key stakeholders, including governments, healthcare professionals, and the public.
In addition to directly promoting the value of laboratory medicine, the IFCC strategic plan involves several other initiatives to increase visibility of the field. One such initiative is to directly impact healthcare and patient outcomes by working with and supporting developing countries to advance various programs, such as global newborn screening. Another aim of the IFCC is to directly contribute to global lab quality via the development of an international IFCC external quality assurance program, particularly for developing countries, and creation of a global reference interval database. Becoming the largest worldwide provider of free distance learning (eLearning) in the field of laboratory medicine is also a large focus of the new strategic plan. To do so, IFCC is developing comprehensive eLearning/eAcademy programs to support global education at no cost, such as our live webinar series. Given the enormous impact the pandemic has had on the laboratory community and general public, IFCC has used some of these strategies to aid in the fight against the COVID-19 pandemic. Ultimately, in all our endeavors, IFCC is committed to encouraging and supporting a culture of innovation and increasing productivity. In this session, I will provide a more in-depth look into these plans, their potential impact, progress made so far, and future directions. With these exciting initiatives, I hope we can all look forward to a promising future for the field of laboratory medicine.

Scientific Oral Presentation Abstract

DISTINGUISHING CHRONIC KIDNEY DISEASE WITH PATHOLOGY TESTS

A/Prof Kenneth Andrew Sikaris

Director of Chemical Pathology, Melbourne Pathology
Melbourne, Australia

Chronic kidney disease is increasing in prevalence due to both the rising incidence of hypertension and diabetes. It is important to detect early renal dysfunction so that preventative measure can be adopted. While creatinine, and various calculations based on creatinine are the mainstay of testing, creatinine also depends on muscle mass which is also determined by gender, ageing and race.

Scientific Oral Presentation Abstract

CARDIOMETABOLIC SYNDROME: PATHOGENESIS AND BIOCHEMICAL MARKERS

Dr. Laila Abdel-Wareth

Acting Executive Director
National Reference Lab/Cleveland Clinic
Abu Dhabi, UAE

Cardio Metabolic Syndrome (CMS), also known as insulin resistance syndrome or metabolic syndrome X, is a combination of abdominal obesity, insulin resistance, dyslipidemia and hypertension. There is a strong link between CMS and increased prevalence of peripheral vascular diseases, coronary artery disease and myocardial infarctions as well as cerebrovascular arterial diseases and stroke. Obesity, adipokines dysregulation, and inflammation are recognized pathophysiological mechanisms for metabolic syndrome. In the Gulf Cooperative Council (GCC); Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates) the prevalence of CMS among men and women ranged from 20.7% to 37.2% (ATPIII definition) and from 29.6% to 36.2% (IDF definition). Obesity, Type 2 diabetes and related metabolic and cardiovascular diseases are highly prevalent in the GCC. Socio-demographic status, age, female gender, higher income, lower educational attainment, urban residence in Saudi Arabia, and rural residence in the United Arab Emirates were commonly noted in CMS patients. The diagnosis of CMS is based on the presence of any of the following abnormal findings: 1) Fasting glucose > 100 mg/dL (5.6 mmol/L) or receiving drug therapy for hyperglycaemia. 2) Blood pressure > 130/85 or receiving drug therapy for hypertension. 3) Serum triglycerides ≥ 150 mg/dL (1.7 mmol/L) or drug treatment for elevated triglycerides. 4) Serum HDL cholesterol <40 mg/dL (1 mmol/L) in men and<50 mg/dL (1.3 mmol/L) in women or drug treatment for low HDL-C. 5) Waist Circumference > 120 cm (40 in) in men > 88 cm (32 in) in women or BMI > 30 kg/m^2. CMS is more prevalent in women with polycystic ovarian disease, sleep apnea, non-alcoholic fatty liver disease (NAFLD), hypogonadism and is associated with increased risk of cancer, chronic kidney disease (CKD) and psychological disorders. The presentation will discuss the pathophysiology and the diagnosis of CMS highlighting important biochemical markers and laboratory investigations.

Scientific Oral Presentation Abstract

HYPERALDOSTERONISM CASE BASED DISCUSSION AND UPDATE OBJECTIVES

Dr. Manal Al Kindi

Senior Consultant Chemical Pathologist
Clinical Lipidologist, & Program Director-Clinical Biochemistry Program
Oman Medical Speciality Board Royal Hospital

Aldosterone is essential for life, It maintains osmolarity, the extracellular volume and blood pressure. Primary hyperaldosteronism (PA) known as Conn's syndrome is a combination of hypertension, hypokalemia and increase in aldosterone. The prevalence of PA among patients with HTN is about 10%. PA is associated with high prevalence of CV disorders. Resistance to conventional anti-hypertensive medication and hypokalemia are clinical features strongly suggestive of PA. Aldosterone/Renin Ration (ARR), aldosterone suppressive test and Adrenal vein Sampling (AVS) are required for diagnosis of PA and for subtype classification. Treatment of PA is based on the type: e.g. adrenalectomy is indicated for aldosterone producing adenoma while for bilateral adrenal hyperplasia medical treatment is required. The laboratorian plays an absolutely crucial role in the analysis and interpretation of aldosterone. The laboratorian must establish the method-specific biases and determine diagnostic thresholds for aldosterone and renin used in their laboratory.

Scientific Oral Presentation Abstract

ETHICS IN CLINICAL RESEARCH: HISTORY & PRINCIPLES

Dr. Anwar Borai

Clinical Scientist and Associate Professor
King Abdulaziz Medical City- Jeddah, King Khalid National Guard Hospital
King Saud bin Abdulaziz University for Health Sciences (KSAU-HS)
Jeddah, KSA

The clinical research is to develop knowledge that improves human health & biology. People who participate in clinical research make it possible to secure that knowledge. The path to finding out if a new lab test or treatment is safe or effective, for example, is to test it on patient volunteers. But by placing some volunteers at risk of harm for the benefit of others, clinical research has the potential to exploit patient volunteers. The purpose of this presentation is to demonstrate to people who are intended to do a clinical research the main ethical guidelines they need to know supported by past history examples of abuse followed by the establishment of fundamental codes and principles of ethics.

Scientific Oral Presentation Abstract

THOUGHTS TO SUCCESS IN SCIENTIFIC RESEARCH

Dr.Yas Al Hadeethi

Professor of Laser Physics
Head of Lithography in Device Fabrication and
Development Research Group, DSR, KAU, Saudi Arabia

The talk aims to provide audience with feelings regarding the "knowledge transfer", including how knowledge is created (conducting the research investigation), the translation and transfer of knowledge to the users and fields of application, and the incorporation of knowledge into utilization. Furthermore, the conditions for conducting original research will be demonstrated.

Scientific Oral Presentation Abstract

HOW TO GET A PAPER PUBLISHED IN AN ACADEMIC JOURNAL

Prof. Suhad Bahijri

Professor of Clinical Biochemistry, Head of Saudi Diabetes Research Group
King Abdulaziz University, Jeddah-KSA

Publishing in a journal is always challenging leading to certain amount of stress. Researchers struggle to get published in a good journal and are frustrated by rejections despite the good quality of their work because their manuscripts lack attention to detail that is needed for acceptance. The most important steps needed for a paper to be published include choose a good research question with an interesting title, reviewing previous studies extensively to help in planning the manuscript, choosing the right co-authors to fulfil needed tasks, explaining the importance of the work, choosing the right journal, as well as knowing how deal with rejections and make use of reviewers' comments.

Scientific Oral Presentation Abstract

HITCHHIKERS GUIDE TO NEXT GENERATION LEADERSHIP

Dr. Laila Abdel-Wareth

Acting Executive Director
National Reference Lab/Cleveland Clinic
Abu Dhabi, UAE

Transformational leaders help followers grow and develop into leaders by responding to individual followers' needs, by empowering them, and by aligning the objectives and goals of the individual followers, the leader, the group, and the larger organization. Some leaders are only able to extract competent effort from their employees, while others inspire extraordinary effort. There are four leadership capabilities organizations need according to Deborah Ancona; sense making, visioning, relating and inventing. In this presentation we will focus on those capabilities as well as the importance of emotional intelligence (EI) for next generation leaders, and how EI can help leaders to get the best out of their teams.

Scientific Oral Presentation Abstract

THE TRIANGLE OF SUCCESS FOR FUTURE LABORATORIES: THE 3 CS AND I MODEL

Dr. Nashat Nafouri

Chair of Healthcare Interest Group & Executive Officer (SQC)
Medical & Quality Director Futurelab

Clinical laboratory since its foundation plays a key role in providing the diagnostic data that healthcare providers use to pinpoint an early and accurate diagnosis. Laboratories are instrumental in providing many of the screening tests required for preventive care and test results are crucial in monitoring disease progression and treatment efficacy. The information technology revolution made the prediction of diseases which used to be a science fiction a reality and hence laboratory industry made huge leaps in just short times especially in the infectious diseases and genetics. So labs are advancing the quality of life of human beings and therefore providing high quality data needs different management style, leadership and operational modality. The objective of my presentation is to provide a model that focus on how to build operational model based on consistency, confidence and competency while maximizing and reserving the knowledge intellectuality of the laboratory to ensure its business growth.

Scientific Oral Presentation Abstract

THE LABORATORY BETWEEN LEADERSHIP AND MANAGEMENT

Mr. Khalid Mohammed Al Zahrani

Operations Administrator, Laboratory Services
King Abdulaziz Medical City, MNGHA

The most difficult challenges in laboratory operations are finding the right approach for offering services that satisfy customers, patients, and personnel. Competition for resources both inside and outside the lab is a key component of maintaining daily operations. The laboratory is the backbone of the healthcare system, giving incredibly valuable information that aids in identifying diseases, managing cases, and tracking the progress of patient health. The provision of laboratory services without the right application of management art and leadership abilities will result in a failure narrative. The ideal strategy for fusing the art of management with effective leadership techniques will be presented in this presentation, and it will transform the medical laboratory from offering only a few services to a center of excellence.

Scientific Oral Presentation Abstract

PATHOLOGY TESTING EXPLAINS THE IMPACT OF DIET ON CARDIOVASCULAR RISK

A/Prof Kenneth Andrew Sikaris

Director of Chemical Pathology, Melbourne Pathology
Melbourne, Australia

It is recognized that diet and lifestyle are the major determinant of insulin resistance and metabolic syndrome and diabetes. While it is true that saturated fat diets increase serum cholesterol, it is also recognized that the increased availability of sugar is a determinant of the obesity epidemic. Pathologists have a unique ability in their tests for prediabetes, including liver dysfunction and dyslipidaemia, to explain the impact of diet on cardiovascular disease (CVD) risk.

Scientific Oral Presentation Abstract

HEPATIC AND EXTRAHEPATIC INSULIN RESISTANCE AND IT'S CLINICAL SIGNIFICANCE

Dr. Ammar Abdulkader Tonkal

Medical Doctor, Lifestyle Medicine Clinic
Mira Gulf Clinic, Jeddah KSA

Insulin resistance is now regarded as a pathological condition; however, some argues that insulin resistance may be a normal physiological mechanism especially under circumstances of energy stress. Although insulin has different effects in target tissues, primarily the liver, muscle, and adipose tissue, the unique responses and their interactions in these tissues regulate the whole body's insulin response, and has recently become a priority in metabolic research. Here we present the latest in tissue-specific hepatic and extrahepatic insulin resistance and the associated dietary interventions under investigation.

Scientific Oral Presentation Abstract

CURRENT METHOD TO MEASURE INSULIN RESISTANCE

Mr. Rayyan Ali Ibraheem Al-Sulaimani

Laboratory Technologist King Abdullah Medical City (KAMC)
Makkah Al-Mokarramah, KSA

Insulin resistance is a pathophysiological condition that has evolved to be a global public health problem associated with a myriad of chronic metabolic diseases. One suggested nexus for these pathologies is insulin resistance (IR). To elucidate IR function for risk prediction, scientists and healthcare providers must identify accurate methods for quantification, assessment, and possible challenges thereof. Unfortunately, due to the inter-individual variability with moderate agreement at best, diabetic status and adherence to medication, and lack of standardization of insulin assays, deciphering for accurate measurement becomes a taxing task. Here, we will shed light on the different methods for IR assessment and highlight their applicable appropriateness.

Scientific Oral Presentation Abstract

INSULIN RESISTANCE! HOW TO REVERSE IT?

Dr. Abdulhadi Ibrahim Bima

Chemical Pathology Consultant
King Abdul-Aziz University Hospital, Jeddah KSA

There is much more to insulin resistance than weight gain. Although irreversible weight gain and the continuous struggle with its loss are the hallmarks of this condition, insulin resistance is also associated with many disease states and health complications. Predominantly, modern lifestyle had driven human metabolism towards insulin resistance. Understanding the new paradigm of insulin resistance is essential to distinguish amongst the different possible approaches to reverse it. Here we will explore the mechanism of insulin resistance and effective dietary and supplementary approaches to curb its progression and even reverse it.

Scientific Oral Presentation Abstract

GLYCATED ALBUMIN AS AN ALTERNATIVE TO GLYCATED HEMOGLOBIN FOR THE DIAGNOSIS AND MONITORING OF DYSGLYCEMIA

Prof. Suhad Bahijri

Professor of Clinical Biochemistry and Head of Saudi Diabetes Research Group
King Abdulaziz University, Jeddah-KSA

The clinical diagnosis of diabetes mellitus is currently made using fasting plasma glucose, 2 h-plasma glucose (2h-PG) and hemoglobin A1c (HbA1c) level. In addition, HbA1c is very widely used to monitor long term glycaemic control in diabetic people. However, each of these tests have several draw backs and inadequacies. For example, HbA1c is affected by anemia as well as shortened red blood cell lifespan, as in patients with hemoglobinopathies, and uncontrolled hyperglycemia, making the measured level inaccurate and underestimated. Moreover, changes in its level are slow and require between 8-12 weeks to be detected. Fluctuations in glycemic control are associated with micro- and macro-vascular complications. Therefore, a better indicator for glycaemic control and fluctuations in glycaemic status is needed, and glycated albumin is proposed as an alternative. Reasons and results from studies for this proposal are discussed.

Scientific Oral Presentation Abstract

UNRAVELLING THE NON-HDL-C STORY

Dr. Manal Al Kindi

Senior Consultant Chemical Pathologist
Clinical Lipidiologist & Program Director-Clinical Biochemistry Program
Oman Medical Speciality Board Royal Hospital

Cardiovascular disease (CVD) is the leading cause of death worldwide. There is a heavy burden of cardiometabolic risk factors such as diabetes, metabolic syndrome and obesity that urges an action to prevent CVD. Hypertriglyceridemia is an important but underestimated risk factor in the pathogenesis of atherosclerosis and must be treated. Non-HDL-C is includes an assessment of all apo B-containing lipoproteins (VLDL, IDL, LDL, and even Lp(a). It is an unrecognized residual CVD risk. It is indirect estimate of LDL particle number which relates more closely to CVD risk than LDL-C in certain patients such patients with diabetes, metabolic syndrome and obesity. Non –HDL-C is a better measure of risk than LDL-C when triglyceride is high.

Scientific Oral Presentation Abstract

INTERFERENCES IN LABORATORY TESTS: AN OLD AND RECURRING PROBLEM

Dr. Nafila Bazdawi Alriyami

Senior Consultant in Clinical Biochemistry Department
Sultan Qaboos University Hospital, Oman

Various types of interferences can affect the validity of laboratory tests and hence the associated clinical decisions based on these test results. The effects of these laboratory errors could potentially range from negligible to devastating and life-threatening effects. It is therefore essential that all laboratory personnel educate themselves on the types of interferences that they could encounter within their laboratories and develop protocols to recognize, report, avoid interferences whenever possible. In addition, education of clinicians about these interferences and how they affect result interpretation is equally important. This talk aims to highlight these aspects.

Scientific Oral Presentation Abstract

IMPORTANCE OF THE PREANALYTICAL PHASE IN DIFFERENT AREAS OF THE LABORATORY

Dr. Waleed Tamimi
Head of Clinical Chemistry Lab
King Abdulaziz Medical City, Riyadh, KSA

The goal of any Clinical or hospital lab is to report the correct result, on the correct patient, to the correct doctor without unnecessary delays. The steps in performing a laboratory test were described the brain-to-brain TAT or "total testing cycle" which include pre-analytical, analytical and post analytical phases. The percentage of errors in pre-analytical phase was reported as high as 70% which represents the major area of error occurrence in the clinical laboratory. The most commons type of pre-analytical errors can be classified under two groups identification problems and sample problems. As consequences of these problems patient safety will be compromised and complications may occur. Health care providers are at many challenges to improve services and reduce errors. There are some mechanisms that may help to detect pre-analytical errors such as education and training of lab and nurse staff for collecting biological samples, delta check, communication between medical staff and laboratory staff, etc. It is important to record and proper documentation of problems. This will allow to identify the problem and focus on proper investigation and root cause analysis and filially initiates and propose the proper corrective action. It is important to monitor and feedback the problems and the corrective action in this area so the all staff are aware of how the interventions are affecting the pre-analytical error rate of their area. In conclusion, it is important to keep sample acceptance standard high for patient safety. It is also important that repetitive errors are not allowed to keep occurring when most are easily preventable. In addition, monitoring of pre-analytical errors to identify deficiencies and monitor success are essential. Moreover, continuing to educate internal and external sample collectors is highly important and effective. Finally, reducing pre-analytical errors not only optimizes patient safety but also improves efficiency of the laboratory service by reducing rework.

Scientific Oral Presentation Abstract

CLINICAL APPLICATION OF HERPES SIMPLEX VIRUS INFECTION

Dr. Fadel Al Hababi

Head of Virology Department
Regional Lab and Blood Bank, Riyadh, KSA

Herpes simplex viruses 1 and 2 (HSV-1 and HSV-2) are DNA viruses from the Herpesviridae family, responsible for causing herpes (genital or oral) and fulminate encephalitis in humans. The virus is transmitted to a seronegative individual via abraded skin or mucosal surface. The aim of this study is to determine seroprevalence of herpes virus of patients on over sera from Riyadh Regional laboratory tested samples.

Methods: The study period started from 2018-2020. A total of 1487 and 1165 serum samples were included for anti-HSV-1 and anti-HSV-2 seroprevalence analysis. The enzyme-linked immunosorbent assay was used to detect anti-HSV-1 and anti-HSV-2 type-specific glycoprotein IgG. The serological status of pregnancy and childbirth and condition of newborns in women seronegative and seropositive to HSV-1 and HSV-2. Also the status of immunosuppression and HIV status were analyzed with recurrent infection and its latent course.

Results: Among HSV-1 infection, 29 patients were severely immunosuppressed patients developing HSV-induced meningitis. These patients, the causative process responsible for meningitis was likely a viral reactivation. Ih HSV-2 among 1165 tested 18.17% were HIV seropositive, 35.35% were congenital and reactivation causing meningitis and genital ulcer. In conclusion: HSV-1 reactivation at the timing of immunosuppression is associated with a high incidence of meningitis in adults and childhood. Also, there is a significant positive association between HSV-2 and HIV-1 in the study population.

Scientific Oral Presentation Abstract

PROCALCALCITONIN AND ITS ROLE IN PATIENTS WITH COVID-19

Dr. Duaa Mohammed Alahdal

Consultant Medical Biochemist KAAUH, PNU
Assistant Professor Tiabah University, Madina, KSA

Procalcitonin (PCT) is 116-amino acid precursor of the hormone calcitonin. It produced by several cell types and many organs in response to pro-inflammatory stimuli, in particular by bacterial products. Among the newest biomarkers for sepsis, Procalcitonin (PCT) has the highest diagnostic accuracy; also, it proved to be useful in monitoring the course and severity of the systemic inflammatory response. A significant elevation of plasma PCT is found during sepsis, but particularly during the early days of severe sepsis and septic shock. In patients with non- bacterial "SIRS", PCT levels are usually found to be in the lower range (<1 µg/L). However, early after multiple trauma or major surgery, in severe burns or in neonates, PCT levels can be elevated independently of an infectious process. The return to baseline is usually rapid and, in these cases, a second increase of PCT can be interpreted as the development of a sepsis episode. Viral infections, bacterial colonization, localized infections, allergic disorders, autoimmune diseases, and transplant rejection do not usually induce a significant PCT response (values <0.5 µg/L). Variance in procalcitonin levels have previously been proposed to differentiate systemic inflammation of bacterial origin from viral origin in community acquired pneumonia and sepsis, with a significant rise indicating bacterial infection. However, despite that Covid 19 is a viral infection, recent studies showed an elevated PCT levels in patients with Covid 19 which are positively associated with the severity of the disease and serial PCT measurements may be useful in predicting the prognosis.

Industry Workshop Oral Presentation Abstract

THE CLINICAL ROLE OF SFLT-1/PLGF AS BIOMARKERS IN THE AID OF THE EARLY DIAGNOSIS OF PREECLAMPSIA

Mr. Ranie Besisou

Medical Affairs Manager
Roche Diagnostics, Saudi Arabia

Preeclampsia is a multisystem progressive disorder characterized by the new onset of hypertension and proteinuria or the new onset of hypertension and significant end-organ dysfunction with or without proteinuria in the last half of pregnancy or postpartum. It is caused by placental and maternal vascular dysfunction and resolves after birth over a variable period of time. Although approximately 90 percent of cases present in the late preterm (≥34 to <37 weeks), term, or postpartum period and have good maternal, fetal, and newborn outcomes, the mother and child are still at increased risk for serious morbidity or mortality. The remaining 10 percent of cases have an early presentation (<34 weeks), which is associated with a higher risk of maternal and fetal or newborn complications than preeclampsia at term and carries the additional high risks associated with moderately preterm, very preterm, or extremely preterm birth. Long-term, patients with preeclampsia are at increased risk for developing cardiovascular and renal disease. During the presentation the speaker talked about the PROGNOSIS study and below is the results as per the study reference "Predictive Value of the sFlt-1: PlGF Ratio in Women " published in NEJM January 7, 2016 vol. 374 no. **with Suspected Preeclampsia.** In the development cohort (500 women), we identified an sFlt-1:PlGF ratio cutoff of 38 as having important predictive value. In a subsequent validation study among an additional 550 women, an sFlt-1:PlGF ratio of 38 or lower had a negative predictive value (i.e., no preeclampsia in the subsequent week) of 99.3% (95% confidence interval [CI], 97.9 to 99.9), with 80.0% sensitivity (95% CI, 51.9 to 95.7) and 78.3% specificity (95% CI, 74.6 to 81.7). The positive predictive value of an sFlt-1:PlGF ratio above 38 for a diagnosis of preeclampsia within 4 weeks was 36.7% (95% CI, 28.4 to 45.7), with 66.2% sensitivity (95% CI, 54.0 to 77.0) and 83.1% specificity (95% CI, 79.4 to 86.3).

Industry Workshop Oral Presentation Abstract

ADVANCES IN NEPHELOMETRY IN RENAL DISEASE MANAGEMENT

Dr. Claus Pruemper

Franchise Head Plasma Protein Testing
Siemens Healthineers, Marburg

Kidney diseases increase the burdens on the financial systems which requires early diagnosis and continuous management with efficient markers that can be run as routine samples and have a positive impact on the disease management, Diagnosis and management of MM with patients under hemodialysis can be more efficient with FLCs testing using nephelometric technology, and how a decision support can support in kidney disease assessment and differential diagnosis.

Industry Workshop Oral Presentation Abstract

LABORATORY BIOMARKERS IN AUTOIMMUNE DISEASE DIAGNOSIS AND MONITORING

Prof. Khosrow Adeli

President, International Federation of Clinical Chemistry and Laboratory Medicine (IFCC)
Full Professor, Laboratory Medicine and Pathobiology (LMP), Biochemistry and Physiology, University of Toronto
Head, Clinical Biochemistry, Paediatric Laboratory Medicine
The Hospital for Sick Children, Toronto, Canada

Autoimmunity refers to the failure of the normal mechanisms of self-tolerance resulting in reactions against one's own cells and tissues. About 80 chronic inflammatory diseases have been identified with genetic predisposition and environmental modulation. The prevalence of autoimmunity is 5-8% in the general population and is increasing in westernized countries. Antibody tests play a supportive role in the clinical evaluation of numerous autoimmune diseases. Autoantibodies are commonly found in healthy individuals. Clinically validated cut-offs are very important in diagnosis and monitoring of autoimmune disorders and can confer a higher likelihood of disease in symptomatic individuals. They enable the prediction, diagnosis, and activity determination of certain autoimmune diseases. Snibe has developed an extensive menu of autoimmune parameters using CLIA technology, with potential for a wide range of clinical laboratory applications. Autoantibody tests are also central to the classification, screening, diagnosis, and monitoring of a variety of autoimmune disorders in children. The current reference limits used to provide a baseline for autoimmune serology result interpretation in children are based on adult reference populations Comprehensive pediatric RIs for autoantibody assays in an apparently healthy and non-hospitalized pediatric cohort have not yet been established across the entire age range. These critical gaps lead to challenges in the interpretation of autoantibody laboratory tests in children. Based on that we have established pediatric reference limits for autoimmune disease markers in the CALIPER cohort of healthy children and adolescents to support their interpretation. They will allow for improved laboratory assessment of pediatric patients using this assay platform worldwide. Pediatric reference limits were found to be below the manufacturer's assay cut-offs established based on adult populations.

Industry Workshop Oral Presentation Abstract

ARTIFICIAL INTELLIGENCE IN THE CLINICAL DECISION

Dr. Samah Khaled Jemaa

Marketing Manager
Abbott Diagnostic, Riyadh, KSA

AlinIQ CDS is a clinician-driven expert knowledge system that enhances clinical management by providing patient centric clinical insights. Clinicians make diagnosis and treatment decisions by gathering and interpreting patient information. The majority of the time this results in accurate, timely diagnoses, but this can also result in errors such as missed, delayed or incorrect diagnoses. Many institutions focus on improving the diagnostic process by ensuring the quality and accuracy of test results. Accurate results are critical; yet most errors occur in test selection and interpretation of results, leading to variability in care and impacting cost, efficiency, and patient outcomes. Decision support technology is one way to reduce the risk of errors. Solutions should address "Rights" to be effective, yet solutions that are focused on alerts or reference information do not address all these areas. The innovative AlinIQ CDS software enables clinical experts to automatically apply their decision-making process to individual patient cases, generating relevant, patient-specific insights at scale. AlinIQ CDS can help eliver high-quality care with patient centric recommendations and interpretations, reduce variability by promoting alignment to your institution’s protocols and guidelines, and increase efficiency through appropriate testing recommendations and improved clinical and laboratory workflows

Industry Workshop Oral Presentation Abstract

NEW GENERATION OF TOTAL LAB AUTOMATION

Mr. Ahmed Tamim

Automation & IT Manager
Beckman Coulter, Riyadh, KSA

We will discuss during our presentation the new technology in total lab automation, and which technology you will need to fulfil you daily lab KPI, and the importance of early identification of errors like the pre-analytical errors you are having on daily basis, which focus on the main problems in the preanalytical part which are tubes mislabelled, not enough volume or the wrong tube type. 1) Mislabelled; if the tubes arrive and you cannot read the barcode, due to either improper location of the label or barcode label coming with scratches, which will need a system to early identify the issue. 2) Inadequate volume; t is hard to know the volume of the liquid inside the tube. Unless you touch every tube, you don't know whether you have enough volume in the tube, which need early identification, as it will lead to unneeded issues like probe damage, or test not done. 3) Wrong tube type; when the wrong tube type has been taken for the tests requested. In order to solve the issue, you need extra efforts to check every tube manually, which will be a waste of time and efforts. So you will need a system to do early identification of wrong tube type, thus preventing having wrong patient results. These 3 challenges cover 60-70% of all pre-analytical errors and if the tubes are coming already labelled you have no control over that, so we need to identify these errors as quickly as possible.
We will also talk about the difference between pull and push system, and what system will be appropriate with your lab. We will talk about the total process control, and how you can achieve your laboratory KPI, using the total process control. Finally, we will talk about our newest Automation, the DXA 5000, and how it is considered as a breakthrough in the Automation market, and how it will solve your daily lab issues.

Industry Workshop Oral Presentation Abstract

THE FUTURE OF M-COMPONENT ANALYSIS

Dr. James Last

Lead of International Medical Science Liaison
The Binding Site Group Limited, UK

Monoclonal gammopathies comprise of several different plasma cell proliferative disorders, the most frequently observed malignant condition being Multiple Myeloma (MM). The detection of both monoclonal free light chains (FLCs) and monoclonal intact immunoglobulins, often referred to as the M-component, secreted by the clonal plasma cells forms an integral part of the diagnosis, monitoring and prognosis of the disease. The introduction of the high sensitivity serum free light chain assay Freelite® greatly improved the ability to detect the monoclonal FLCs and the utility of this assay is recognised through its inclusion in national and international guidelines for the diagnosis and monitoring of MM. Detection of the monoclonal intact immunoglobulins, however, are still largely dependent on serum protein electrophoresis and immunofixation, with limited sensitivity for the detection and accurate quantification of these M-components. The recent development of the novel Hevylite® assays has improved the detection of monoclonal intact immunoglobulins and can overcome some of the limitations associated with electrophoresis when attempting to accurately quantify these M-components. Furthermore, these assays offer unique information regarding the measurement of suppression of the polyclonal immunoglobulins in MM, from which recovery of this suppression has been shown to be a good prognostic marker. More recently still, the ongoing development of novel mass spectrometry methods promises to further revolutionize the ability to detect M-components, which much greater sensitivity than existing standard methods. Early data from development of these assays show near comparable sensitivity to next generation flow cytometry and next generation sequencing techniques, with the added benefit of only requiring a serum sample from the patient and not a bone marrow biopsy. Thus, in the near future, mass spectrometry may improve patient management by offering a non-invasive, highly sensitive method for both diagnosis and serial monitoring of MM.

Industry Workshop Oral Presentation Abstract

VALUE OF AUTOMATED TOXICOLOGY SCREENING

Mr. Mahmoud Zaghloul

Thermo Fisher Scientific, Business Development Manager
CDD, Saudi Arabia

The presentation is intended to present the importance of automated TOX screening in eliminating false positive results which saves time and cost of confirmatory solutions. This comes from the assays reagents technology of having multi-metabolites targeting the designated metabolites with high cross-reactivity to exclude undesired metabolites reactions.

Industry Workshop Oral Presentation Abstract

DRUGS OF ABUSE: A NEW IVD LCMSMS ASSAY FOR SCREENING AND CONFIRMATION OF 108 OF THE MOST COMMON ILLICIT DRUGS

Dr. Frank Kühlwein

Head of International Sales
Chromsystems GmbH, Munich, Germany

The screening and confirmatory analysis of amphetamines, THC-COOH, opioids, barbiturates and other illicit drugs in a routine lab represents a challenge, including stability issues through to traceability and increasing regulatory requirements. German Manufacturer Chromsystems GmbH, a leading supplier of chromatographic assays in the clinical field, provides a complete solution that overcomes all these issues. The LC-MS/MS assay covers 108 of the most common illicit drugs - good news for governmental authorities such as forensic laboratories or poison control centres.

Industry Workshop Oral Presentation Abstract

THE IMPORTANCE OF PRECISE AND RELIABLE GLUCOSE AND KETONE MEASUREMENTS IN CRITICAL CARE SETTINGS

Dr. Marcin Pacek

Senior Director of Medical and Scientific Affairs
Europe, Nova Biomedical

Blood glucose monitoring systems (BGMS) that utilize test strip chemistry are extensively used in hospitalized patients and in particular critically ill patients to assess and manage dysglycemia at the point of care (POC). Monitoring patient glucose levels can also be important in a number of clinical and diagnostic procedures undertaken in hospital outpatient or specialised clinics. The accuracy of most BGMS is affected by a number of pathophysiological factors present in the blood matrix of hospital patients endogenous. As such this has raised concerns about the use of BGMS in hospital settings. Ketones are substances the body produces when glucose (blood sugar) levels are too low for energy production. If glucose levels are insufficient, the cells cannot get enough glucose, and the body begins to break down fat for energy instead. This process produces substances known as ketones, which can accumulate in blood and urine and high ketones levels might indicate ketoacidosis. In the case of diabetic patients, diabetic ketoacidosis (DKA) is a severe complication of diabetes that can lead to a coma or even death. During analysis, three types of ketones can be detected. Beta-hydroxybutyrate accounts for the majority, at more than 80% of total ketones and it's found in the whole blood. The other two ketones, acetoacetate and acetone, account for less than 20% of overall ketone bodies and can be found in urine. The accuracy of POCT ketone meters, similar to glucometers, can be affected by multiple factors. In this presentation we'll discuss some of them and the impact on correct diagnosis of DKA.

Industry Workshop Oral Presentation Abstract

HIGH SENSITIVITY TROPONIN TESTING AT THE POINT OF CARE

Mr. Steve Carey

Marketing Lead - POC Cardiac
Siemens Healthineers, GBI

When a patient enters the Emergency Department presenting with the symptoms of a myocardial infarction (MI), every moment is critical. Achieving favourable clinical and operational outcomes requires fast and accurate chest pain assessment at the point of care, as well as coordination with the laboratory for quality assurance. Having high-sensitivity troponin testing at the point of care producing accurate results in just 8 minutes could transform care delivery for millions of people each year, improving ED throughput, reducing stress and strain on acute care clinicians, and aiding in optimizing the use of time and resources of busy laboratories.

Learn about the advances in Point of Care immunoassay technology, the diagnostic performance of the Siemens Healthineers POC hs-TnI assay and the latest supporting clinical evidence.

Poster Presentation Abstracts

Abstract # 1

Characterization And Purification of *Commiphora Gileadensis* Acetone Extract with Antiproliferative Activities on Breast Cancer

Moodi Alharbi[1], Abdullah Aldairi[2], Ayman Alhazmi[3], Ahmad Alghamdi[3]

[1] Diabetic center, King Abdulaziz Specialty Hospital, Ministry of Health, Taif, [2] Laboratory Medicine Department, Faculty of Applied Medical Sciences, Umm Al-Qura University, Makkah, [3] Department of Clinical Laboratories Sciences, College of Applied Medical Sciences, Taif University, KSA.

Background: Globally, breast cancer is the most prevalent cancer in women. It accounts for more than 1 in 10 newly diagnosed cases annually, and the median age of women at the time of breast cancer diagnosis is 61 years. Locally, Breast cancer is the second most prevalent malignancy and the ninth most common cause of death. It is a multifactorial disease defined as cancer that develops in the breast tissue and usually appears in the inner lining of milk ducts or the lobules that supply the ducts. The tumor drug discovery depends on the tolerability and safety that have been detected in some natural products. *Commiphora gileadensis (C. gileadensis)* belongs to the family of Burseraceae and can be found in the Southern area of Saudi Arabia, Yemen, Oman, and Africa. The aim of this study was to evaluate the antiproliferative effects of *C. gileadensis* on two breast cancer cell lines MCF-7 and MDA-MB-231.

Methods: The cell viability was estimated by MTT assay, and the response was determined by IC_{50} values. Afterward, the acetone extract was characterized using Liquid Chromatography-Electrospray Ionization-Mass Spectrometry (LC-ESI-MS).

Results: The acetone extract of *C. gileadensis* showed growth inhibition against MCF-7 and MDA-MB-231 cell lines with IC_{50} (57.32 µg/mL), (49.94 µg/mL), respectively. Additionally, the composition analysis of the acetone extract confirmed the presence of hexosylceramide (39.1%), ceramide (18.6%), and phosphatidylinositol (12.3%) of the total amount of lipid and to a lesser extent, Sphingosine phosphate (0.1%).

Conclusion: *C. gileadensis* extract possesses a potent cytotoxic effect on breast cancer cell lines.

Poster Presentation Abstracts

Abstract # 2

Incidence and Risk Factors of Low Testosterone Levels in Diabetic and Non-Diabetic Men

Ayman A. Al Hayek

Department of Endocrinology and Diabetes,
Diabetes Treatment Center, Prince Sultan Military Medical City, Riyadh, Saudi Arabia

Background: To determine the prevalence of subnormal testosterone concentrations (Hypogonadism) based on both symptoms and biochemical available measures in patients with type 2 diabetes and healthy men and determine its associated factors.

Methods: Total, and free testosterone, Prolactin, Sex Hormone Binding globulin, follicle stimulating hormone Leutinizing Hormone,HbA1c, FBS, and Lipid Profile concentrations were analyzed in a cross-sectional study included a 1398 patients with type 2 diabetes aged between 30-70 years , and 628 non-diabetic subjects matched for age to the diabetic group selected randomly from general population, after complete observation and examination, fasting blood sugar, postprandial blood sugar, and HbA1c were measured to exclude diabetes . Of 1398 patients with type 2 diabetes recruited, patients received any medications affect sex hormone concentrations (n= 8), receiving testosterone replacement therapy (n= 36), liver cirrhosis (n= 8), as well as thyroid disorders; hematologic disease (n= 9), malignant disease (n= 11) or coming from foreign countries (n= 110), and 40 patients did not complete the study were excluded, leaving 1049 patients and 628 non-diabetics

Results: Irrespective of presence of DM; the overall prevalence of Hypogonadism among all study participants was 29.2%. The prevalence of subnormal total testosterone concentrations in diabetic men, and nondiabetic men was 36.4% and 17.2% respectively with a confidence interval of (1.80, 3.11; P value < 0.005). The mean total testosterone concentration of diabetic men was significantly lower than that of nondiabetic men, total testosterone concentrations were negatively and significantly (P value < 0.005) related to diabetes, monthly income, and BMI in multiple regression analysis. 29% of hypogonadal diabetics (total testosterone level <3 ng/ml) had symptoms of androgen deficiency, while 70.2% of nondiabetic whom had biochemical androgen deficiency had symptoms of androgen deficiency with a significant difference between the two groups regarding (ADAM) responses (p < 0.005). Among the non-diabetics we found that 1.9 % of those with serum testosterone level < 3ng/ml had primary hypogonadism and 98.1% had secondary hypogonadism, while 16.9% of those diabetics with serum testosterone level <3 ng/ml had primary hypogonadism, and 83.1% had secondary hypogonadism.

Conclusion: In this study we found a higher prevalence of hypogonadism among men with type 2 diabetes than the non-diabetics. This urgently calls for implementing early and universal screening programs irrespective of symptoms of androgen deficiency to detect those who have low serum total testosterone level at any early stage and to conduct further studies to evaluate interventions that raise testosterone levels in hypogonadal men.

Poster Presentation Abstracts

Abstract # 3

Comparison of Point-of-Care Glycosylated Hemoglobin and Laboratory Hba1c and Its Relationship to Time-In-Range and Glucose Variability

Ayman A. Al Hayek

Department of Endocrinology and Diabetes,
Diabetes Treatment Center, Prince Sultan Military Medical City, Riyadh, Saudi Arabia

Background: The main objective of the current study was to perform a comparison of point-of-care testing for hemoglobin A1c (POCT-HbA1c) versus standard laboratory method (Lab HbA1c) and their relationship to time-in-range (TIR) and glucose variability (GV) among patients with diabetes mellitus (DM) presented to the outpatient diabetes clinics .

Methods: This single-center cross-sectional study was carried out on diabetic patients (aged ≥14 years of both genders) who undergo routine follow-up at our institution and whose physicians ordered HbA1c analysis for routine care. The included patients were using the Continuous Glucose Monitoring (CGM) system for at least three months and regular CGM users with at least 70% use .

Results: We included 97 diabetic patients (41 female and 56 male), with a mean age of 29.75±13.55 years and a mean DM duration of 10.33±5.48 years. The mean values of Lab-HbA1c and POCT HbA1c were 8.82%±0.85% and 8.53%±0.89%. The TIR, time below range, and time above range were 33.47±14.38 minutes (47.78%±14.32%), 5.44±2.58 minutes (8.41%±4.42%), and 28.8±8.27 minutes (43.81%±13.22%). According to the Bland-Altman plot analysis, the POCT-HbA1c values are consistent with the standard Lab-HbA1c values (SD of bias= 0.55, and 95% CI= -0.78 to 1.4). Using the univariate linear regression analysis showed a statistically significant relationship between laboratory HbA1c and POCT HbA1c (R2= 0.637, p <0.001), TIR (R2= 0.406, p <0.001), and GV (R2= 0.048, p= 0.032). After adjusting for age, gender, disease duration, diabetes type, and percentage of sensor data in a multivariable linear regression model, the linear associations remained significant (all $p < 0.05$).

Conclusion: TIR and GV have promise as preferred measures for identifying clinical trial endpoints, estimating the likelihood of DM-related complications, and gauging a patient's glycemic condition.

Poster Presentation Abstracts

Abstract # 4

RELATIONSHIP BETWEEN VITAMIN D RECEPTOR GENE POLYMORPHISMS AND TYPE 1 DIABETES MELLITUS IN SAUDI POPULATION

Wafa Al-Gaid, Archana Iyer, Maryam Al-Ghamdi

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Background: Type 1 diabetes Mellitus (T1DM) is a common autoimmune endocrinopathy that results from an interaction of environmental and genetic factors. Vitamin D has potent non-calcaemic effects and is involved in the modulation and regulation of immune systems. Vitamin D deficiency has been shown to accelerate the onset of T1DM. Moreover, vitamin D deficiency leads to impaired insulin secretion, which is reversible by 1, 25-dihydroxyvitamin D administration. The biological effect of vitamin D is thought to occur by binding to the vitamin D receptor (VDR) which belongs to the steroid receptor superfamily. Although many polymorphisms exist in the VDR gene, their effect on VDR protein function and signaling is unknown. An association between VDR polymorphism and T1DM has been reported in some studies; however, it appears to vary across different populations around the world. Hence this study was carried out to investigate the relationship between VDR gene polymorphisms at three restriction sites ApaI, BsmI and TaqI and the risk of T1DM in Saudi population.

Methods: One hundred Saudi volunteers were classified according to Fasting Blood Glucose (FBG) test as two groups T1DM and control. The target part of VDR gene was isolated and amplified by the polymerase chain reaction (PCR). PCR products were digested by restriction enzymes: ApaI, TaqI, and BsmI and electrophoresed on agarose gel.

Results: The result shows that distribution of genotypes frequency of the BsmI VDR gene polymorphisms differed highly significantly between T1DM and control groups (p-value =0.0081<0.05). On the other hand, there was no significant difference in genotypes and alleles frequencies of the VDR gene polymorphisms at position TaqI and ApaI between T1DM patients and control groups.

Conclusion: The result shows that distribution of genotypes frequency of the BsmI VDR gene polymorphisms differed highly significantly between T1DM and control groups (p-value =0.0081<0.05). On the other hand, there was no significant difference in genotypes and alleles frequencies of the VDR gene polymorphisms at position TaqI and ApaI between T1DM patients and control groups.

Poster Presentation Abstracts

Abstract # 5

Association Between TGF-β1Gene Polymorphisms with Type 2 Diabetes Mellitus with or without Diabetic Nephropathy in Saudi Patients

Suad M. Muthaffar[1], Amani M. Alhozali[2], Nehad M. Makki[2], Amal S. Alfaidi[1], Ekhlas M.Alrowily[1], Samar A. Sultan[1], Nuha M.Alrayes[1], Hams Alzahrani[1] , Ahmed .Mirza[1] , Reham Abdulnoor[2]

[1]Department of Medical Laboratory Sciences, Faculty of Applied Medical Sciences, and [2]Department of Internal Medicine King Abdulaziz University Hospital, Jeddah, Saudi Arabia

Background: Diabetes applies to a group of metabolic disorders concerning chronic hyperglycemia caused by insufficient insulin secretion and it is a multifactorial disease influenced by the interaction between genetic and environmental variables. The International Diabetes Federation has estimated the prevalence of diabetes and stated that diabetic individuals will rise to 700,000,000 by 2045. Diabetic nephropathy (DN) is one of the main complications of Type 2 Diabetes Mellitus (T2DM). Transforming growth factor-beta1 (TGF-β1) is one of the pro-fibrotic cytokines and causes fibrosis progression in DN and can be affected by the polymorphisms of the genes. The objective of this study is to determine the genotypic and allelic frequencies of TGF-β1gne(rs1800469). The aim of our research is to determine the relationship between TGFB1 gene polymorphisms and the risk of T2DM and DN .

Methods: The rationale of our study is to find out Association between TGF-β1gene polymorphisms and risk of T2DM in population. This case control study involved 132 cases and 77 controls samples. DNA extraction and genotyping were done by Taqman assay specific for (rs1800469) to determine genotype of the samples. For validation we use sanger sequencing method.

Results: We found that the tested Single Nucleotide Polymorphism (SNP) in TGF-β1gene (rs1800469) were consistent with the Fisher Chi-squared test in both patients and controls. It shows the in-significant differences of TGF-β1gene polymorphisms between T2DM, DN patients, and healthy controls. Non-significant differences were detected between T2DM patients and controls in the frequencies of TGF-β1 (rs1800469) alleles and genotypes.

Conclusion: Our results indicated that TGF-β1 1gene(rs1800469) is not significantly associated with T2DM and DN in Saudi patients. Larger prospective studies are needed to validate our findings.

Poster Presentation Abstracts

Abstract # 6

Evaluation of Sex Hormones Values in Sudanese Male Patients with Metabolic Syndrome

Dalia Ibrahim Wagea Alla[1], Ghofran Tharwat Akasha [2], Randa Hamza Abdalrahim[2] and Khanssa M Elamin[3]

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[2]Department of Clinical Chemistry, Faculty of Medical Laboratory Sciences, National University, and
[3]Department of Medicine, Faculty of Medicine, Mashreq University, Khartoum, Sudan

Background: Metabolic syndrome is a cluster of endocrine irregularities such as obesity, insulin resistance, systemic hypertension, and dyslipidemia. Metabolic syndrome has been associated with global decrease in birth rates and fertility potential. Many previous studies demonstrated abnormal serum estradiol and testosterone ratios that have been shown to be associated with metabolic syndrome.

Methods: This is an analytical cross sectional case control and hospital-based study aimed to evaluate the serum levels of testosterone and estradiol in association with metabolic syndrome in male Sudanese patients. 100 Male participants were randomly selected for this study, from large private medical centers in Khartoum state in the period from August 2021 to November 2021. Of those, fifty male subjects diagnosed with metabolic syndrome were taken as cases group, with corresponding other fifty matched healthy male individuals were chosen as control group. The diagnosis of metabolic syndrome was based on National Cholesterol Education Program (NCEP) Adult Treatment Panel III definition. Informed consents were signed from all participants in the study and the data collected with the use of interview administrated questionnaire. Basic patient's characteristics with relevant parameter were obtained. This included metabolic syndrome parameters [waist circumference, body mass index, fasting blood glucose, insulin resistance]. Blood samples were collected after overnight fasting. Serum glucose, lipid profile was estimated using mindray BS 200 full automated chemistry auto analyzer. The estimation of Insulin hormone by using VEDA.LAB auto analyzer and testosterone estradiol hormones were estimated by manual ELISA. Insulin resistance calculated by HMOA – IR. SPSS program was used for analysis of the relationship between estradiol, testosterone and metabolic syndrome

Results: This study showed significantly increased levels of estradiol (p-value 0.000) and significantly decreased levels of testosterone (p-value 0.000) in the case group when compared to control group. The comparison of estradiol and testosterone in case group according to number of metabolic syndromes finding shows insignificant differences p value (0.067 and0.269) respectively. Correlation of testosterone and estradiol hormones with demographic data, anthropometric and findings of metabolic syndrome shows insignificant correlation with testosterone while estradiol shows significant negative correlation with fasting blood glucose (p value 0.015) and triglycerides levels (p value 0.013).

Conclusion: Increased serum level of estradiol and decreased serum level of testosterone were strongly associated with metabolic syndrome in Sudanese males. This increased ratio of serum estradiol to testosterone levels, might affect fertility of these males with metabolic syndrome in Sudan.

Poster Presentation Abstracts

Abstract # 7

Use Of Complexed to Total Prostate-Specific Antigen Ratio as Prognostic Marker in Patients with Prostate Cancer and For Improve Differentiation of Prostate Cancer from Benign Prostate Hyperplasia

Sara Abdelmahmoud Omer

Department of clinical chemistry, Faculty of Medical Laboratory Science, Ibn sina university, Khartoum, Sudan

Background: Prostate cancer (PCa) is the second most frequent malignancy after lung cancer in men worldwide, prostate specific antigen (PSA), is commonly used for prostate cancer screening. However, increased PSA serum levels are also associated with prostate inflammatory disease. In fact, high PSA levels were found in patients with benign prostate hypertrophy (BHP) or prostatitis Furthermore; it is difficult to discriminate prostate cancer from benign prostate diseases. The current study aimed to investigate complexed to Total Prostate-Specific Antigen Ratio(c/tPSA) in PCa patients and its association with disease progression.

Methods: case –control study conducted on 100 randomly selected patients with PCa and 100 patients with BPH attending the Khartoum Oncology Specialized Center (KOSC) and AL-Gazeira hospital in AL-Gazeira state-Wd-Madani department of urology and 100 healthy control men. After inform consent, blood samples were collected to measure the level of tPSA and fPSA by ELISA (enzyme linkage immunosorbent assay).

Results: c\t PSA and levels was compares between the different five grade of cancer in PCa patients, grade 1 and 2 classified as (early grade) and grade 3,4 and five classified as (late grade) of prostate cancer which found significant increase in c\t PSA and significant decrease in f\t PSA in late grade of prostate cancer when compared with early grade p=0.003,0.000 respectively. ROC curves according to the range of tPSA 4-10ng/ml is analyzed in the AUC for f\t PSA was significantly higher than those for, fPSA, c\t PSA and cPSA (.591vs .354., 540, and .468<0 .000) respectively. In men whose values of tPSA were in the range of 10- 50ng/ml, the AUC for cPSA was significantly higher than that for, fPSA, f\t PSA and c\t PSA (.667vs. 618, .369 and .549P <0 .000) respectively.

Conclusion: According to the finding this study conclude that c\t PSA can be used as marker for prostate cancer progression and f/tPSA can improve the detection of prostate cancer and reduce unnecessary biopsies. when tPSA is within 4-10 ng / ml and cPSA when the tPSA within 10-50 ng /ml.

Poster Presentation Abstracts

Abstract # 8

Method Verification of Three Thyroid Autoimmune Tests by Cobas 8000 Analyzer E801 Module Using Electrochemiluminescence Immunoassay (Eclia) Method

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Background: Type 1 diabetes Mellitus (T1DM) is a common autoimmune endocrinopathy that results from an interaction of environmental and genetic factors. Vitamin D has potent non-calcaemic effects and is involved in the modulation and regulation of immune systems. Vitamin D deficiency has been shown to accelerate the onset of T1DM. Moreover, vitamin D deficiency leads to impaired insulin secretion, which is reversible by 1, 25-dihydroxyvitamin D administration. The biological effect of vitamin D is thought to occur by binding to the vitamin D receptor (VDR) which belongs to the steroid receptor superfamily. Although many polymorphisms exist in the VDR gene, their effect on VDR protein function and signaling is unknown. An association between VDR polymorphism and T1DM has been reported in some studies; however, it appears to vary across different populations around the world. Hence this study was carried out to investigate the relationship between VDR gene polymorphisms at three restriction sites ApaI, BsmI and TaqI and the risk of T1DM in Saudi population.

Methods: Method verification of three quantitative immunoassay tests performed using Roche reagents on Cobas e801 modules using serum samples. Method verification was done according to the laboratory policy followed CLSI guidelines. Precision study was performed using 50 quality control samples of 2 different concentrations for each test run for a period of 5 days. Mean, SD and %CV were calculated and compared to the manufacturer recommendation. Method comparison study was done comparing 25 samples of patients for each test. Linearity study was done using 3 to 4 different concentrations of patient, calibrators and PT samples that are spanning the analytical measurement range (AMR).

Results: All analytes met allowable precision criteria. Within-run and between days precision study for low and high concentrations, %CV were 8.22 & 3.69 (A-TPO), 4.01 & 2.32 (A-TG) and 2.79 & 1.98 (A-TSHR) respectively. We observed through the study that A-TPO was less stable than other analytes but still within the manufacturer recommended Coefficient of variation which is (%CV = 10). Method comparison acceptable criteria slope 0.9 – 1.1 and correlation coefficient (r) >0.975, data for each analyte were calculated by EP evaluator and the yielded slope for all analytes showed satisfactory correlation between the results with correlation coefficient (r) value from (0.990-1.000) and slope values close to one, and the y-intercept were close to zero. All tests found linear over the AMR and agreed with the manufacturer claim, 9-600 IU/ml for Anti-TPO, 10-4000 IU/ml for Anti-TG and 0.8-40 IU/L for A-TSHR.

Conclusion: Overall performance of all three thyroid autoimmune quantitative immunoassay tests were acceptable on Roche Cobas 8000 (e801 module). They provided reliable results for patients' samples testing.

Poster Presentation Abstracts

Abstract # 9

Establishment of Reference Interval for Hemoglobin A1c and Other Hemoglobin Variants for Healthy Adults in the Western Region of Saudi Arabia

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Background: Establishment of Reference intervals (RIs) for Hemoglobin A1c and other Hemoglobin variants (A1A, A1B, F, LA1c+, A0) is crucial for the purpose of screening, diagnosis and monitoring of diabetes and other hemoglobin abnormalities using the HPLC method. Hb A1c is now used largely for DM control, and other hemoglobin variants (A1A, A1B, F, LA1c+, A0) used for determining of any abnormalities in different hemoglobin variants. Due to lack of locally derived RIs for such parameters; laboratories use RIs derived from other populations. Therefore, the RIs for such parameters must be established for diagnosis and follow up of DM and detecting any abnormalities in the level of different hemoglobin variants.

Methods: Cross sectional study was conducted in Saudi Arabia as part of the IFCC global multicenter study. 409 healthy adult subjects (>18 years, BMI 28.3 ± 6 Kg/m2) were recruited, and their blood samples were tested for HbA1c by Tosoh G8 HPLC analyzer. Complete blood count and other tests of biochemistry were tested simultaneously for the same samples. The needs for RIs partitioned by sex and age was based on standard deviation ratio (SDR) based on 3-level nested ANOVA. RIs were derived parametrically with/without application of latent abnormal values exclusion method (LAVE).

Results: Based on thresholds of SDR≥0.4 and/or Bias Ratio (BR)≥0.57, RIs for A1c and other Hb variants were not partitioned by sex or BMI but partitioned by age for A1c, LA1c+, A1B and A0. The multiple regression value (MRV) for A1c was noted to be significantly increased with metabolic parameters of Uric acid and GGT in females (rp = 0.36; rp = 0.39) more than males (rp = -0.02; rp = 0.16) respectively.

Conclusion: This study showed that RIs for A1c and other Hb variants applied on healthy adult Saudis can be significantly affected by age. The obtained outcomes will improve the interpretation and the clinical decision of Hemoglobin A1c and other hemoglobin variants results using the HPLC method.

Poster Presentation Abstracts

Abstract # 10

Validation of Automated Solid Phase Extraction (SPE) Method on Biotage® Extrahera™ workstation For Quantitative Analysis of Amphetamines in Urine

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Background: Amphetamines refer to the parent compound in a class of compounds called substituted amphetamines, which includes amphetamine itself (AMPH), methamphetamine (METH), and 3,4- methylenedioxymethamphetamine (MDMA). Amphetamine has powerful central nervous system (CNS) stimulant actions, in addition to peripheral actions typical of indirect sympathomimetic drugs. Main effects of acute administration are wakefulness, decreased sense of fatigue, elevation of mood, and increased ability to concentrate. Amphetamine also suppresses appetite. Most of amphetamine's effects are believed to be due to its ability to stimulate the release of biogenic amines (norepinephrine and dopamine) from their storage sites in the nerve terminals. The acute toxic effects of amphetamine (tremor, irritability, insomnia, confusion, anxiety, delirium, and hallucinations) are extension of the pharmacological effects and may be due to an increased release of serotonin from nerve terminals, or to direct effects on serotoninergic neurons.

Methods: Validation performed using Extrahera™ (Biotage, Uppsala, Sweden) as a solid phase extraction (SPE) workstation with In-house prepared standards and reagents. Method validation was done according to the laboratory policy following Clinical Laboratory Standards Institute (CLSI) guidelines. Method comparison study was done by comparing 20 known samples that extracted by the old SPE workstation RapidTrace™ (Biotage, Uppsalam Sweden) and analyzed through LC-MS/MS 8040 in Prince Sultan Military Medical City (PSMMC). Precision study was done on multi-levels of reference materials and coefficients of variation (%CVs) were calculated for each level. Cut-off verification was done using a reference material with cut-off concentration verifying the analytical cut-off of the test.

Results: Method comparison, Accuracy, carry-over, matrix effect, cut-off verification of 500 ng/mL and interference studies were all passed and within allowable error of 20%. amphetamines, slope was 1.01, which is within acceptable criteria and correlation coefficient (r) 1.000. Precision for 4-levels of reference materials with different concentrations, for amphetamines, CV were 9.0%, 4.7 %, 6.2% and 7.3% respectively. Linearity/Calibration verification analyzed over a measured range point of 50 to 5000 ng/mL for amphetamines and were acceptable.

Conclusion: The performance of amphetamines analysis using solid phase extraction workstation Extrahera™ on LC-MS/MS provides reliable results for diagnosis and detecting amphetamines and is suitable for detection and analysis in Toxicology division.

Poster Presentation Abstracts

Abstract # 11

Predictors of Steroid Resistance in Patients with Focal Segmental Glomerulosclerosis (FSGS)

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Background: Focal segmental glomerulosclerosis (FSGS) is a progressive disease that leads to end stage chronic kidney disease. It is caused by damage and loss of podocyte. Therapeutic approach requires administration of steroid to prevent further damage and proteinuria. However, some patients develop steroid resistance with persistent proteinuria. The aim of this study is to determine the biochemical predictors of steroid resistance in patients with FSGS.

Methods: This is a retrospective case-control study. Data collected from hospital information systems of two tertiary care hospitals in Oman, Royal hospital and Sultan Qaboos University Hospital, from 2006 to 2020. Patients presented with proteinuria and had biopsy proven FSGS were included. Those who have secondary causes of FSGS were excluded. Patients were identified as steroid resistant based on persistent proteinuria or double of plasma creatinine for > 8 weeks post-therapy. Predictors' data collected retrospectively from first visit.

Results: Out of 135 FSGS patients, 32 cases with primary FSGS and treated with steroid were found and analyzed. A total of 19 (59.4%) patients were found to be resistant to steroid. Among these, 11(61.1%) of which were males and 8 (57.1%) were females. Male patients presented with FSGS at earlier age compared to females ($p < 0.010$). Baseline parameters taken and showed that there is no significant difference in serum creatinine, urine protein, urine creatinine, and urine protein creatinine ratio between steroid resistance and steroid dependent patients. Females presented with higher level of serum and urine creatinine as a disease manifestation compared to males. However, gender was not found to be a predictor of steroid resistance in FSGS patients. Presence of comorbidities like obesity, hypertension, or type 2 diabetes was not associated with steroid resistance in FSGS patients. Baseline total and non-HDL cholesterol levels were significantly higher in patients who developed steroid resistance ($p < 0.050$). ROC curve applied
to see these markers as predictors for steroid resistance FSGS. By using Youden's index, the optimal cut point for total cholesterol was 6.7 mmol/L with 94% sensitivity and 58% specificity (95% CI: 56.5–94.5). Likelihood ratio was 2.3.

Conclusion: Lipid profile may serve as a predictor of steroid resistance in patients with FSGS. Knowing the possibility of resistance can help in avoiding unnecessary exposure to steroid with its side effects. Larger sample size is needed, and further studies are required to study histological and novel biomarkers of steroid resistant FSGS.

Poster Presentation Abstracts

Abstract # 12

Instability of Amino Acids and Acylcarnitines in Dried Blood Spots Stored at Different Temperatures: The Effect on Retrospective Analysis of Inborn Errors of Metabolism Biomarkers

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Background: Dried blood spots (DBS) that have been stored can provide valuable samples for the retrospective diagnosis of inborn errors of metabolism (IEM) as well as validation studies for newborn screening programs. Inborn metabolic errors can have serious clinical consequences in neonates and young infants, and early detection and treatment of IEM can reduce mortality and morbidity. We decided to investigate the effect of different storing conditions (temperature and humidity) on amino acids and acylcarnitine encountered during DBS sample collection and transportation as part of the newborn screening program.

Methods: Dried blood spots from (41) healthy newborns were collected and stored at (room temperature (22 °C - 25 °C, Humidity <30%) RT, (37°C Humidity <30%), and (4 °C, Humidity >30%). and tested at five days, one month, and two months.

Results: Amino acids and Acylcarnitine in dried blood spot samples decayed rapidly at 37°C and 4°C without controlled humidity. Pro, Cit, Xle, and Val remained stable for two months. C0 increased over time. C3DC, C5:1,C5DC, C5OH,C6,C8,C10, C10:1, C14, C14:1, C16, C16OH, C18:1, C18OH, C4DC,C4OH, C12,C18 decayed or decreased quickly during storage. C2, C3, C4, and C5 acylcarnitine gradually decayed.

Conclusion: Amino acids acylcarnitine profiles in DBS maintained at 37°C, room temperature, and 4°C without properly controlled humidity are prone to metabolite instability and false interpretations for both screening and retrospective investigations. Blood spots should be properly packaged and sent to a newborn screening lab under controlled temperature and humidity. Highlighting the need for, the use of fresh samples for validation experiments and regularly re-evaluating cut-offs, following transport and storage guidelines, and including control DBSs with stored patient samples during retrospective diagnostic cohort studies.

Poster Presentation Abstracts

Abstract # 13

Validation of Electrochemiluminescence Immunoassay (ECLIA) Method for The Analysis of Anti-Mullerian Hormone AMH in Serum Using Cobas e801 Analyzer

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Background: Anti-mullerian hormone AMH is used to check women fertility and the ability to produce eggs. It considered to be the best endocrine marker to predict future reproductive lifespan. AMH is useful in assessing ovarian status including ovarian reserve and ovarian responsiveness. It is useful also in assessment of menopausal including premature ovarian failure. In infant it is helpful in evaluating ambiguous genitalia and other intersex conditions. It is also used in monitoring patients with anti-mullerian hormone-secreting ovarian granulosa cell tumors.

Methods: Anti-mullerian hormone AMH method validation was performed using Roche Reagent on cobas e801 module using serum samples. Method validation was done according to the laboratory policy followed CLSI guidelines. The Precision study was performed using 50 quality control samples of 2 different concentrations run for a period of 5 days. Mean, SD and %CV were calculated and compared to the manufacturer recommendation. Method comparison study was done comparing 27 samples of patients. Linearity study was done using 5 different concentrations of patient samples that are spanning the analytical measurement range (AMR).

Results: Between days precision study for low and high concentrations, %CV were 4.7 & 4.6 respectively. Method comparison acceptable criteria slope 0.9 – 1.1 and correlation coefficient (r) >0.975, data were calculated by EP evaluator and the yielded slope showed satisfactory correlation between the results with correlation coefficient (r) value 0.9996 and slope values close to one (0.919) , and the y-intercept were close to zero (0.1449) . All tests found linear over the AMR and agreed with the manufacturer claim 0.07 – 164 pmol/L

Conclusion: Overall performance of AMH test were acceptable on Roche Cobas e801 module provided reliable results for patients' samples testing.

Poster Presentation Abstracts

Abstract # 14

Non-Targeted Scanning Detects Highly Toxic Compounds in Herbal Medicine

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Background: Patients who self-remedy or seek alternative therapeutics, such as herbal medicines, may experience severe toxicity or even lethality. Toxic alkaloids are among the potent compounds that can kill users if treatment is not sought immediately. Poisoning by alkaloids produced by aconite (Aconitum nabellus) is particularly difficult to diagnose and even harder to treat. Aconite root extracts are used by many folk doctors as a homeopathic remedy. However, these practitioners do not know the exact ingredients or concentrations, so they usually harm their patients. The clinical picture of alkaloid toxicity is usually treated symptomatically; however, the identification of a particular toxic compound is crucial in some cases. Robust, reliable and fast scanning of thousands of compounds in a single analysis can be achieved by the combination of a good ultra-high-performance liquid chromatography (UHPLC) instrument and a high-resolution mass spectrometer (HRMS). In the present study, a UHPLC-HRMS-qTOF instrument (ABSciex) was used to identify the alkaloids in an ingested plant powder and biological samples from an emergency toxicology patient.

Methods: A 200 µL volume of the patient's urine was diluted with 800 µL of DiH2O:MeOH (80:20) in an Eppendorf tube. The tube was centrifuged at 13000 rpm for 10 min. The supernatant was transferred into a 1.5 mL LC vial and inserted into an LC autosampler. Similarly, 100 mg of the ingested powder was added to 1 mL of MeOH and thoroughly vortexed. The mixture was then warmed in a 50°C water bath for 30 min, filtered through a 0.45 µm filter into an Eppendorf tube, centrifuged at 13000 rpm for 10 min, and 200 µL of the supernatant was added to a 1.5 mL LC vial containing 800 µL DiH2O. Analyses were performed using a SCIEX X500R QTOF HRMS system coupled to an ExionLC™ AC UHPLC. The alkaloids were separated on a Phenomenex Kinetex 100 Å 2.6 µm phenyl-hexyl column (50 × 4.6 mm) using mobile phases consisting of 10 mM ammonium formate in water (phase A) and 0.05% formic acid in methanol (phase B). The following gradient program was used: 10% phase B (0–7 min), 98% (7–8.5 min), and 10% (8.6–9.5 min).

Results: A 10 min run time was sufficient to screen and identify the four main toxic alkaloids (aconitine, mesaconitine, hypaconitine and jesaconitine) produced by aconite with high intensity and resolution and even provided their molecular formulas.

Conclusion: The results showed the importance of using non-targeted HRMS screening for analysis in emergency toxicology cases. 'Dilute-and-shoot' is a highly recommended procedure in emergency toxicology cases, especially when the exact cause of symptoms is not known and/or an unknown mixture of folk remedy agents has been ingested.

Poster Presentation Abstracts

Abstract # 15

Method Verification of Hba1c Test by Cobas C513 Analyzer Using Turbidimetric Inhibition Immunoassay (TINIA) Method

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Background: Measurement of Hemoglobin A1C is accepted as a method to measure long-term glucose control in patient with diabetes mellitus , Determination of hemoglobin A1C provides an important tool for monitoring the efficiency of dietary control and therapy during treatment of diabetes mellitus , The average life of a red blood cell is 120 days , Measurement of hemoglobin A1C can reflect the mean daily blood glucose concentration over the preceding two to three months and provides a much better indication of glycemic control than blood or urinary glucose determinations.

Methods: Turbidimetric inhibition Immunoassay (TINIA) method used to verify HBA1C test using Roche reagents on Cobas c513 using whole blood samples. Method verification was done according to the laboratory policy followed CLSI guidelines. The precision study was performed using 50 quality control samples of 2 different concentrations run for a period of 5days. Mean, SD and %CV were calculated and compared to the manufacturer recommendation. Method comparison study for HbA1c was done comparing 20 samples of patients. Linearity study was done using 6 different concentrations of patient samples that are spanning the analytical measurement range (AMR).

Results: Between days precision study for low and high concentrations, %CV were 1.3 & 1.4 respectively. Method comparison acceptable criteria slope 0.9 – 1.1 and correlation coefficient(r) >0.975, Data were calculated by EP evaluator and the yielded slope showed satisfactory correlation between the results with correlation coefficient (r) value 0.9994 and slope values close to one (1.030) , and the y-intercept were close to zero (0.111) . All tests found linear over the AMR and agreed with the manufacturer claim, 4.2 – 20.1 %

Conclusion: Overall performance of HbA1c test were acceptable on Roche Cobas c513 provided reliable results for patients' samples testing.

Poster Presentation Abstracts

Abstract # 16

Assessing and Optimizing Several Enzymes Used for Drug Analysis in Urine

Fatimah Abdullah Algethami

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Background: Some medicines, like paracetamol, can be metabolically altered via glucuronidation. In urine samples, it can be challenging to directly detect glucuronide conjugate using high-performance liquid chromatography. Chemical substances known as drugs have a variety of beneficial therapeutic effects on the human body. To improve patient care and increase operational effectiveness, clinics and laboratories must work together. To accurately assess compliance and prevent wasteful testing and patient costs, the test menu, assay cutoffs, and testing algorithms used in urine drug testing panels should be reviewed on a regular basis. Therefore, the main problem is How will assessing and optimizing several enzymes used for drug analysis in urine. The glucuronidation reaction for xenobiotic biotransformation takes place in the metabolic pathway that includes the UDP-glucuronosyltransferases. Additionally, this metabolic pathway is crucial for the excretion of endogenous substances such bilirubin, steroids, steroid hormones, and fat-soluble vitamins. When glucuronides maintain their stability in incubation mixes, this procedure may not work well and it may be necessary to find another method of hydrolysis.

Methods: Paracetamol 3-D-glucuronide was created in order to determine the ideal hydrolysis conditions. Five -glucuronidases (5000 units/ml urine) from five different sources (Helix pomatia, Escherichia coli, Patella vulgate, bovine liver, and abalone) were used to hydrolyze urine that had been spiked with synthetic paracetamol 3-D-glucuronide. The hydrolysis reactions were incubated for various amounts of time. And the steps of the method will use in this study as the following: Preparation of Glucuronide Standard, Preparation of ISD, Preparation of buffer, Working Enzyme stock solution preparation (5000 Fishman Units/mL), Urine sample digestion with β-Glucuronidase, Solid phase extraction, Instrumentation, Data processing, optimize hydrolysis using β-glucuronidase from various species.

Results: The results and outcomes will show that these enzymes' reactivity verified. The hydrolysis process improved more by the Patella vulgate and Helix pomatia enzymes than by the other three enzymes. However, over a range of incubation durations, the enzyme isolated from Patella vulgate was the most productive. The method evaluation revealed strong inter-day and intra-day precision, good accuracy (expected range from 90-120%, with variance of findings less than 20%), and good linearity. According to the guidelines set forth by the Scientific Working Group for Forensic Toxicology (SWGTOX), the precision and accuracy levels expected was acceptable. This is result of the glucuronides' strong hydrophilicity, which makes separating them from the primary matrix components that interfere difficult. As a result, prior to analysis, enzymatic hydrolysis or chemical hydrolysis is required for glucuronides measurement in biological samples.

Conclusion: Enzymatic hydrolysis of glucuronide metabolites in urine samples is significantly influenced by the source of the enzyme and the incubation durations. Therefore, when performing enzymatic hydrolysis of glucuronide metabolites in urine samples, various other parameters such as the hydrolysis pH and the incubation temperature should be carefully evaluated. There are a number of crucial aspects that should be taken into account while analyzing glucuronide metabolites in order to maximize hydrolysis by -glucuronidase.

Poster Presentation Abstracts

Abstract # 17

Establishment of Reference Interval for Immunoglobulins and Free light Chains in Healthy Adults Saudi Population

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Background: Testing serum free kappa (FK), free lambda (FL) and K/L ratio is considered as part of the International Myeloma Working Group guidelines for the diagnosis and management of monoclonal gammopathies. Therefore, reliable diagnosis and management are based on reliable reference intervals (RIs) in each population. This study was dedicated to study the RIs for free kappa (FK), free Lambda (FL), K/L ratio in addition to immunoglobulins (IgG, IgM, IgA) for the Saudi population using the Freelite reagents from Binding Site.

Methods: A total of 180 apparently healthy individuals aged ≥18 years were recruited from western, central and eastern regions of Saudi Arabia using the IFCC reference interval committee and decision limits protocol specified for the global study. All serum specimens were measured using Freelite reagents from Binding Site. Multiple regression analysis (MRA) was performed to explore sources of variation of each analyte. The variation in reference values attributable to sex, age, BMI and region was calculated by ANOVA as a standard deviation ratio (SDR). RIs were derived by the parametric method.

Results: MRA revealed that region, BMI, smoking and exercise were not relevant sources of variation for any analyte. Based on SDR cutoff value (>0.4), between-sex partition RIs was not required for all analytes except IgM. Both FK and FL were highly associated with IgA (r= 0.73, r= 0.41; p<0.001) respectively.

Conclusion: RIs for free light chains (FK, FL, K/L ratio) and immunoglobulins analytes specific for Saudi Arabians were established in careful consideration of various factors. The ranges were different from those provided by the manufacturer and from other countries.

Poster Presentation Abstracts

Abstract # 18

Expanded Newborn Screening for Primary Carnitine Deficiency in Saudi Arabia

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Background: Primary carnitine deficiency (PCD) an autosomal recessive disorder resulting from a defect in the carnitine transporter encoded by SLC22A5. PCD could result in sudden death if not diagnosed and managed early. PCD prevalence in Saudi Arabia is unclear. Newborn screening (NBS) for PCD in Saudi Arabia started in January 2019. The current study aims to determine the incidence of PCD in Saudi Arabia.

Methods: Dried blood spots (DBS) specimens were collected from the newborn babies between 24-72 hours after birth during the period from 2019 to 2021. Free carnitine (C0) was used as a biomarker for PCD screening. C0 levels in DBS were measured utilizing liquid chromatography tandem mass spectrometry (LC-MS/MS). Initial remarkable results were evaluated and confirmed by second samples before being referred for medical management.

Results: 14 out of 43199 screened newborn babies were identified to have decreased C0 level while only one baby confirmed by the genetic analysis to have PCD. Our study yeiled an incidence of 1:43199 for PCD in our NBS Center. The NBS findings showed slightly higher false positive rate in preterm babies suggesting the need to use lower NBS cut-off value for this group of subjects.

Conclusion: We reported the incidence of PCD in our NBS Center. It is crucial to increase the coverage of newborn screening in Saudi Arabia for early diagnosis of this fatal and highly treatable disease.

Poster Presentation Abstracts

Abstract # 19

Method Verification of Acetaminophen (Paracetamol) in Emergency Laboratory

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Background: Acetaminophen or Paracetamol is a widely used analgesic and antipyretic found in a number of over-the-counter and prescription products. When consumed in overdose quantities, acetaminophen may cause severe liver and kidney damage, or death. The patient may have few or no symptoms early after acute overdose of acetaminophen. The only reliable early diagnostic indicator is provided by a quantitative measurement of the serum acetaminophen level. Clinical evidence of liver and kidney damage is usually delayed for 24 hours or more after ingestion, well after the time that the prophylactic antidote, acetyl cysteine, can be effectively administered.1 Acetyl cysteine is highly effective in preventing liver damage, especially if administered within 8 to 10 hours after overdose, and improves survival in patients with hepatic failure when initiated 12 to 16 hours after overdose. The assay is based on a homogeneous enzyme immunoassay technique used for the quantitative analysis of acetaminophen in human serum or plasma. The assay is based on competition between drug in the sample and drug labelled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH) for antibody binding sites. Enzyme activity decreases upon binding to the antibody, so the drug concentration in the sample can be measured in terms of enzyme activity.

Methods: The methods historically used to monitor serum acetaminophen concentrations are high-performance liquid chromatography, gas-liquid chromatography, UV spectrophotometry, and colorimetric immunoassay. Acetaminophen validation was performed using Roche Reagent on Cobas c501 and c311 modules using serum and heparinized plasma samples. Method validation was done according to the laboratory policy followed CLSI guidelines. Precision study was performed using 50 quality control samples of 2 different concentration in inter run for a period of 5 days. Mean, SD and CV% were calculated and compared to the manufacturer recommendation. Method comparison study was done comparing 25 samples of patients. Linearity study was done using 7 different concentration patient samples that spanning the analytical measurement range (AMR) from 35.1 – 1308 Umol/L. Sensitivity test performed using diluent Normal Saline (NS) and got close to 33.7 Umol/L which is LLOD.

Results: Between days precision study for low and high concentrations, CV% were 1.7 and 2.3 respectively. Method comparison acceptable criteria: slope 0.9 – 1.0 and correlation coefficient ® ≥0.998, data was entered to EP evaluator, the yield slope was 1.003 and correlation coefficient ® = 0.9988 the method was found linear over the AMR of 33.7 – 1308 Umol/L. The low limit of quantitation observed 33.7 which is agreed with the manufacturer claim (33.1).

Conclusion: Overall performance of Acetaminophen was acceptable on Roche Cobas c311. It provides reliable results for patient's samples testing in Emergency Department.

Poster Presentation Abstracts

Abstract # 20

NLRP3 and Interleukin Dysregulation in Saudi Adults with Varying Levels of Glycemia

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Background: NLRP3 inflammasomes recognize pathogen- and danger-associated molecular patterns (PAMPs and DAMPs). They stimulate downstream signaling cascades and immune responses, increasing interleukin (IL) production and hence, progression of chronic inflammatory disorders, including type 2 diabetes (T2D). This study investigated the serum levels of NLRP3 protein and interleukins (IL-1a, IL1b, IL-18, IL-33, IL-37) in Saudi adults with T2D and pre-diabetes (PD).

Methods: Clinical data from 407 Saudi adults (age 41.3±9.1 years) were retrieved from the database of the Chair for Biomarkers of Chronic Diseases, King Saud University, Riyadh, Saudi Arabia. Participants were stratified according to their HbA1C levels (>6.4% T2D, 5.7%-6.4% PD, and <5.7 normoglycemic controls). HbA1c levels and interleukins were measured using commercially available immunoassays.

Results: Serum IL-1b levels were highest (1.6 [0.7-3.9] pg/ml) in controls as compared to PD (0.81 [0.71-1.97] pg/ml) and T2D (0.68 [0.66-2.5] pg/ml) ($P<0.05$). The same is true for serum IL-18 (36.7 [7.6-89.2] pg/ml versus PD (11.3 [1.4-39.1] pg/ml) versus T2D (11.9 [2.9-36.7] pg/ml) participants. Serum IL-37 levels were significantly higher ($p<0.001$) in controls (2.91 [2.4-3.0] pg/ml) than PD (2.4 [2.1-6.9)] pg/ml) and lower than T2D (6.0 [5.1-6.2] pg/ml) patients. No differences were seen in NLRP3, IL-1a and IL-33. In all subjects, circulating IL-1a and triglycerides significantly predict NLRP3 levels by as much as 46% of the variances perceived ($R2 =0.46$; $p<0.01$) while TG and NLRP3 significantly predicts ($R2 =0.43$; $p<0.01$) IL-a1 levels.

Conclusion: Pro- and anti- inflammatory interleukins are dysregulated in patients with PD and T2D. They can be used as biomarkers to predict diabetes severity and may be used as promising pharmacological targets in reducing chronic inflammation in T2DM.

Poster Presentation Abstracts

Abstract # 21

Evaluation and Implementation of a Commercial Quality Control (Qc) Product to Monitor Serum Indices Detection in Daily Routine Use

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Background: Modern Clinical Chemistry analyzers assess each specimen for sample integrity (levels of Hemolysis, Icterus and Lipemia). The reporting or cancelling of the analytes results of each specimen depend on the serum indices results. Yet there is no current common practice of the implementation of daily monitoring the Instrument's H.I.L. testing ability using a commercial QC product. Therefore, in this study we focused on such Q.C. product evaluation.

Methods: We evaluated the implementation of daily routine use of serum indices QC. We used a commercially available Bio-Rad LiquichekTM Serum Indices QC material on Abbott Architect c8000 Chemistry analyzers. We run the QC twice a day on each of our 3 instruments and monitored the performance for 2 months. Data was transferred to Bio-Rad Unity Real Time (URT) QC data management software through a Unity Connect application. Mean, standard deviation and coefficient of variation were calculated in Unity Real Time (URT) for each Instrument in order to follow up our QC daily performance. Trouble shooting steps and other actions were also accurately recorded and monitored.

Results: Over a 2 months period of monitoring on 3 different Instruments, a total of 1,296 data points were collected. The QC performed well with a precision of % CV ≤ 1.97% Hemolysis, ≤ 2.67% Icterus and ≤ 6.80% Lipemia. The three instruments performed with a slightly different mean, but not outside 1.5 SD. No "out of control" situations were observed, TAT was not affected.
To mimic a possible day to day Lab scenario, the saline bottle used as HIL reagent was deliberately contaminated using a few drops of whole blood to study the effect of gross hemolysis reagent contamination on HIL readings. The commercial HIL quality control detected the problem. It's performance showed increase in Hemolysis, slight decrease in Icterus and a slight increase in Lipemia readings.

Conclusion: Bio-Rad Liquichek Serum Indices QC is easy to use with a long shelf life. It helps to monitor the instrument's ability to detect the sample integrity. Results can be compared to peer group unlike the home brewed QC. Peer group comparison helps to monitor and troubleshoot any bias or shift from the peer group and brings added value to the total QC process.

Poster Presentation Abstracts

Abstract # 22

Newborn Screening for Homocystinuria at a Tertiary Center in Saudi Arabia

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Background: Homocystinuria (HCU) is an inborn error of metabolism caused by cystathionine beta-synthase enzyme deficiency. Affected patients present with intellectual disability and other comorbidities. The early diagnosis and treatment, inevitable complications can be prevented. Newborn screening (NBS) for HCU in Saudi Arabia started in January 2019. The current study aims to determine the incidence of HCU in Saudi Arabia.

Methods: Dried blood spots (DBS) specimens were collected from the newborn babies between 24-72 hours after birth during the period from 2019 to 2021. Methionine levels were measured utilizing liquid chromatography tandem mass spectrometry (LC-MS/MS). Initial remarkable results were evaluated and confirmed by second samples before being referred for medical management. The positive cases confirmed by plasma homocysteine analysis and molecular studies.

Results: A total of 43199 newborn babies were screened for HCU during the study period with a coverage rate of 100 %. The outcomes of our study revealed an incidence of 1:14400 for HCU.

Conclusion: A total of 43199 newborn babies were screened for HCU during the study period with a coverage rate of 100 %. The outcomes of our study revealed an incidence of 1:14400 for HCU.

Poster Presentation Abstracts

Abstract # 23

Studying the Impact of Storage Conditions: Time and Temperature on Serum Sex Hormones Levels of Premenopausal Women

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Background: Throughout each woman's reproductive life, female sex hormones responsible for her reproduction undergo continuous and variable cyclic changes. Hence, the assessment of female serum sex hormones levels is a fundamental step to settling the diagnosis, deciding treatment, or describing the prognosis for women with complaints or problems regarding their reproductive health. There is little knowledge about the impact of storage time and temperature on hormone stability, but hormonal analytes are thought to be more labile than biochemical analytes. In healthcare facilities with a lack of specialized endocrinology laboratories, delayed analysis of serum samples is very common. Serum samples must be kept for a while before they can be transported and analyzed. Long-term storage of serum samples could change the hormone levels that are measured, which could lead to misdiagnosis, poor treatment, and even ineffective management. Therefore, this study aimed to study the impact of storage conditions (time and temperature) on serum sex hormones levels of premenopausal women. In addition, it aimed to provide preliminary guidelines regarding optimal storage time and temperature for samples withdrawn in peripheral healthcare facilities.

Methods: The current case-control study was performed on 30 adult females within their reproductive age. Each sample was split into 3 aliquots, and these aliquots were classified according to their storage conditions; the first aliquot was analyzed immediately at time zero without storage and used as a control. However, the third and fourth aliquots were analyzed after storage at 2-8 °C and -70 °C, respectively, for 7 days and used as cases. Within 1 hour, all aliquots were shipped from peripheral hospitals to the specialized endocrinology laboratory at 2-8 °C on ice packs, where a female sex hormones assay was performed by using the chemiluminescence technique in the Beckman Coulter Access 2 machine. A total allowable error of 25% for FSH and LH and 20% for Prolactin, Progesterone, and Estradiol was set as a threshold for clinical significance according to the College of American Pathologists (CAP) as a reference.

Results: Overall, the serum sex hormones levels did not show any statistically significant differences between the control and case groups at different storage times and temperatures ($P>0.05$). Furthermore, these differences had no clinical significance compared to the total allowable error.

Conclusion: The serum samples for the sex hormones investigation, which included FSH, LH, Prolactin, Progesterone, and Estradiol, revealed higher than expected stability and can be stored at (2-8 °C and -70 °C) for up to 7 days

Poster Presentation Abstracts

Abstract # 24

Protective Effect of BTK Targeting in Induced Liver Injury in Murine

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Background: Liver injury is a common health problem world-wide. Every year, approximately 2 million people die from liver disease, with 1 million dying from liver injury complications and another million dying from viral hepatitis and hepatocellular carcinoma. Inflammatory responses of liver injury can cause subsequent liver complications. There is lacking in therapeutic or prophylactic drug to prevent long term complications. Tyrosine kinases targeting have shown to be a good strategy for preventing and / or treating liver injury.

Methods: This study aims to investigate the ability Bruton's tyrosine kinase (BTK) targeting using ibrutinib (IB) in reducing the inflammatory responses of injured liver rats. Thirty-five male Wistar rats were used in the study. The animals were divided into 6 groups namely: positive control (PC), negative control (NC), N-acetylcysteine (NAC) treated group, ibrutinib 2 mg/kg (IB2) treated group, ibrutinib 1 mg/kg (IB1) treated group, ibrutinib 0.5 mg/kg (IB0.5) treated group in 8 days duration. On the 9th day, liver injury was induced using paracetamol 1.5 mg/kg. After that, serum samples were collected and Tumour necrosis factor- α (TNF-α), interleukin-β (IL-β), interleukin-6 (IL-6), and malondialdehyde (MDA) were investigated using ELISA assays.

Results: The results revealed that there was a significant dose-dependent decrease in the inflammatory and oxidative stress markers in paracetamol-induced liver toxicity rats' model after treatment with IB. The groups of rats that treated with high dose of IB 2 (mg/Kg) showed a higher protective effect comparing to the reference drug group (NAC).

Conclusion: The potent anti-inflammatory effects of IB could have protective and / or therapeutic effects on acute liver injury induced by hepatoxic agents such as paracetamol toxicity. However, the work should be translated to clinic setting in order to validate our findings.

Poster Presentation Abstracts

Abstract # 25

Assessment of the Quality at The Analytical Phase Through Routine Chemistry Testing Using Different Goal-Setting Models.

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Background: In clinical laboratories, it is well known that it is crucial to managing the quality of the analytical process. The goal-setting models are critical for the management of analytical quality and the correct implementation of error models. However, the methods for determining analytical performance and, more importantly, the objective goal of analytical quality is open to discussion. Therefore, the main objective of this study was to examine the analytical performance characteristics of regular clinical chemistry tests with different goal-setting models that diverse institutions have proposed.

Methods: The study was conducted using data from internal and external clinical chemistry quality control results. Three Abbott architect analyzers (c16000) were used. Analytical total error calculated with the following formula TAE% = BIAS%+ (1.65CV%). Measurement uncertainty is calculated according to the Nordtest uncertainty model. The total analytical error was compared with BVRICOS and BVEuBIVAS biological variation (BV) and CLIA goals. The measurement uncertainty was evaluated with CCLM permissible measurement uncertainty (pU%) and EQUAS goals for (PU%).

Results: The analytical performance characteristic was evaluated using different quality goals; According to BVRICOS, all performance goals were attained except for six analytes calcium, bicarbonate, chloride, sodium, magnesium, and total protein. Whereas, Amylase, chloride, sodium, lactate dehydrogenase at one level and total protein were higher, according to BVEuBIVAS. Furthermore, calcium and potassium were found to be unacceptable compared to CLIA. The uncertainty was evaluated according to a related quality goal; only urea was found acceptable at both levels. Albumin was accepted at level 1 and alanine aminotransferase at level 3 according to CCLM (PU%). Finally, all performance goals were achieved in the EQUAS targets for (PU%).

Conclusion: Despite the debate about ATE and MU, the application of measurement uncertainty can guarantee the suitability of laboratory test results for clinical purposes. These test findings must be reviewed with measurement uncertainty in mind to minimize misdiagnosis. Furthermore, laboratories should consider goal-setting models when designing statistical quality control.

Poster Presentation Abstracts

Abstract # 26

Assessment of Serum C Reactive Protein/Albumin Ratio as Biomarker for Polycystic Ovary Syndrome Patients

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Background: The prevalence of polycystic ovarian syndrome (PCOS) among the patients with an excess of androgen, irregular menstrual cycles, recurrent anovulation, a propensity for central obesity, and insulin resistance, is about one in seven women. The idea that PCOS may be fundamentally an inflammatory condition was sparked by the current understanding that chronic subclinical inflammation is frequent in the context of PCOS. Aim: This study aimed to assess serum C reactive protein (CRP)/albumin ratio as a predictive biomarker for PCOS.

Methods: 129 PCOS-diagnosed premenopausal women and 129 ethnically age matched premenopausal women were both enrolled in the study. Immunoturbidimetric and endpoint BCG methods respectively, were used to detect serum CRP and albumin.

Results: significant increase in the level of CRP and CRP/albumin was observed in this study within the PCOS patient with P value (0.00), (0.03) respectively, while insignificant different in the ratio of CRP/ albumin result were observed between the study groups (PCOS) when categorized them according to menstrual cycle regularly, infertility, and age with P value (0.4), (0.41), (0.42) respectively. Also, this study shows a significant positive correlation between CRP/albumin ratio and BMI with P value (0.008).

Conclusion: The data of the present study conclude that PCOS women had higher level of CPR/albumin ratio which support the idea that chronic inflammation may play a critical role in the pathophysiology of PCOS.

Poster Presentation Abstracts

Abstract # 27

Total protein and globulin in type 2 diabetic patients with and without retinopathy at KAMC-NGHA -Jeddah, Saudi Arabia

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Background: Saudi Arabia has the seventh highest diabetes prevalence rate globally, making diabetes mellitus a significant public health problem. An estimated 77% of diabetic patients will eventually develop diabetic retinopathy (DR), a common eye condition. However, the disease continues to be a common cause of working-age adult-onset blindness, and there is an unexplained increase in retinopathy in the prevalence of type 2 diabetes. This study investigates the relationship between specific protein biomarkers relevant to diabetic retinopathy and non-retinopathy.

Methods: A retrospectively cross-sectional study of fifty-nine patients with type 2 diabetes from the outpatient clinic of the King Abdulaziz Medical City (KAMC-NGHA), Jeddah-Saudi Arabia, was randomly selected. The patient was divided into two groups; diabetes type 2 with retinopathy (DR; n=44, 57.9%) and diabetes type 2 with non-retinopathy (NDR; n=32, 42.1%). All results were extracted from the BestcCare database at KAMC-NGHA. Furthermore, glycosylated hemoglobin A1c, serum protein levels, and serum globulin results were retrospectively detected, and their values were evaluated. Analyses were performed in SPSS, and the data were expressed as the mean ± standard error of the mean (95% confidence interval (CI)) and categorical data as frequency (%).

Results: Seventy-six patients with type2 diabetes were included in the study. The age average was 60.7± 13.23 years, with higher in females at 53.9%. After data analysis, we found that both diabetic patients with and without retinopathy had elevated total serum protein levels and serum globulin [DR; 28.6±4.22(g/L),71±4.7(g/L)], and [NDR; 32.1±5.87 (g/L), 72.2±6.0 (g/L)], respectfully, but these values were still within normal ranges. The serum globulin between groups was highly significant p value= < 0.01 and 95% CI.

Conclusion: Here, we assessed the relationship of gamma globulin to the incidence of type 2 diabetes. This high serum globulin level may play a role in future advances in diagnosing, monitoring, and therapy diabetic retinopathy patients. Therefore, we should continue biomarker research to better understand diabetic retinopathy and its clinical relevance.

Poster Presentation Abstracts

Abstract # 28

Serum Estradiol Level in Ovarian Cancer Patient Khartoum State Sudan

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Background: A female hormone-dependent tumors, such as ovarian Cancer, is the most common malignancies afflicting women from both developing and developed countries. A preponderance of evidence indicates that these cancers are multi factorial diseases, with genetic susceptibility, environment, nutrition and lifestyle risk factors playing important etiologic roles. Currently, a prevailing concept in the mechanisms of female hormone dependent cancer appearance is the impairment of estrogen metabolism in general, and 17-beta estradiol (E2), in particular. This impairment results in the increased concentration of hormones circulating in blood, or a local increase of their content in target tissues. Elevated estrogens may be involved in ovarian carcinogenesis; however, the exact nature of the estrogen-ovarian cancer link remains unclear. There for, this study aimed to assess the level of serum biomarker 17-beta estradiol (E2) among ovarian cancer women at Khartoum State - Sudan. Then compare the findings of the biomarker test result with the control group, and correlate with study variables.

Methods: Cross-sectional study conducted at Gynological Oncology clinics in Omdurman Military hospitals, during the period of May to December 2017 included 90 female, ages ranged between 16 to 80 years. Blood samples were collected and centrifuged using standardized procedure, Serum estradiol (E2) concentration was determined using AIA-600 II Automated Immunoassay System (TOSOH Bioscience) for quantitative determination of Estradiol (E2), the data were using SPSS version (21).

Results: A 97% of the ovarian cancer were epithelial cell origin and only 3 % were germ cell origin. Staging of ovarian cancer among study group grading from stage 1, 2,3 and,4 were 11%, 13%,19% and 57% respectively. There was no statistical difference of serum biomarker 17-beta estradiol (E2), level among ovarian cancer and control individuals. E2 mean concentration was 86.61ng/ml in the study group, and 79.04 ng/ml in the control group shown insignificant difference with p-value 0.680 along with mean concentration of Para/ multi parity and Nulliparous sub groups of ovarian cancer patients were 72.50 ng/ml, 101.26ng/ml respectively shown insignificant difference with (P-value = 0.113) . Mean concentrations of this marker among cancer stages 1,2,3, and 4 shown 175.2, 68.9, 101.1, and 68.1 respectively, which shown significant difference with p-values (0.041) . An estimated sensitivity 63%, Specificity 60%, Positive predictive value 59%, and Negative predictive value 55% were calculated.

Conclusion: The study concludes that epithelial ovarian cancer is the most common followed by germ cell tumors. Serum level of E2 biomarker within the reference range in the control group. There was insignificant difference between the study and control group but there was a significant difference in circulated level among OVC stage 2,3, and4.

Poster Presentation Abstracts

Abstract # 29

Investigating Inflammatory Predictor Proteins of Patients with Cataract in Type 2 Diabetes.

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Background: Diabetes mellitus (DM) is a significantly common health problem in the Saudi population. DM creates a high risk of ocular disorders, including cataracts. Indeed, cataract is a multifactorial disease and the leading cause of visual impairment worldwide. Several critical studies have investigated cataract incidence in diabetic patients. Some studies indicate that cataracts are three to four times more prevalent in patients with diabetes under the age of 65 and twice as prevalent in patients over the 65years. Moreover, scientific research has revealed a causal protein biomarkers relationship between DM and cataract development. This study investigates the relationship between inflammatory predictors C-reactive protein to serum albumin ratio (CAR) and glycated hemoglobin levels (A1C) in patients with cataract in Type 2 Diabetes.

Methods: A cross-sectional of a total of 150 outpatients with type 2 diabetes (T2D) and cataract from Ophthalmology clinics at the King Abdulaziz Medical City (KAMC-NGHA), Jeddah-Saudi Arabia, were randomly selected. All results were retrospectively extracted from the hospital's database. The study was designed based on cross-sectional, and the statistical data were analyzed by the SPSS version 20. The patient data were collected for two groups: type 2 diabetes with cataract and type 2 diabetes without cataract. Furthermore, the patient data obtained from the BestCare hospital database demonstrate the clinically diagnosed gender, age, and laboratory tests. Statistical analysis used a biostatistical t-test for results validation, spearman rank correlation, and scatter plot.

Results: Of the 150 subjects, (82.9%) were diagnosed with T2D, and (61 %) were diagnosed with type 2 diabetes and cataract (T2DC). All groups had a significant association between A1C and CAR. Also, there were elevated values than the normal range of A1C and CAR in both groups (T2D;7.9 ± 2.40, and 0.3±0.66) and (T2DC;6.9 ± 3.26, and 0.4± 0.75), respectively.

Conclusion: Our result investigated the link between systemic inflammation and T2D. According to this finding, type 2 diabetes patients need inflammation management to avoid developing cataract and prevent cataract surgery.

Poster Presentation Abstracts

Abstract # 30

Neonatal Screening for Congenital Adrenal Hyperplasia in Saudi Arabia: A Retrospective, Descriptive study

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Background: A congenital adrenal hyperplasia (CAH) is a group of autosomal recessive disorders in which enzymes in the cortisol biosynthesis pathways are interrupted by gene mutations. More than 90% of CAH, is caused by 21-hydroxylase (21OHD) deficiency. The 17α-hydroxylase (17OHD) deficiency one of the less common forms of CAH, can result in significant morbidity and mortality if left untreated, thus making early diagnosis essential. In Saudi Arabia, research related to CAH is limited. Hence, this study aimed to examine the incidence and the associated clinical characteristics of neonatal CAH at Prince Sultan Military Medical City, Saudi Arabia, and provide evidence-based guidance for its application in CAH screening.

Methods: This retrospective, descriptive study, was conducted in April 2022 at Pediatric Endocrinology Department, Prince Sultan Military Medical City, Riyadh, Saudi Arabia. We reviewed the screening database in search of babies with suspected CAH, that is, altered birth- weight adjusted 17-hydroxyprogesterone (17-OHP) values at screening.

Results: A total of 54,940 newborns were screened from January 2019 to April 2022; among them, 169 CAH cases were detected, yielding an incidence of 1:325. Compared to females (38.1%), a higher percentage of males (67.7%) were diagnosed with CAH. The mean 17-OHP of the study population was 89 ± 32.4, gestation period 31.8 ± 12.5, and bodyweight of 1762 ± 367 g. Female infants have a lower mean 17-OHP value (75 ± 23.1) than males (93 ± 26.2). No significant changes were found in the bodyweight of male infants (1767g) and female infants (1759 g). Compared to other regions of Saudi Arabia, a higher percentage of (65.7%) of the CAH-positive case diagnosed in the Riyadh region.

Conclusion: The present findings highlighted the need for CAH screening by the public health care system in Saudi Arabia. Further, focused and evidence-based interventions, extensive collaborative studies, or meta-analyses are essential to determine the life-saving benefits of screening.

Poster Presentation Abstracts

Abstract # 31

Establishment of the Reference Intervals for Common Cardiac and Liver Enzymes using Two Different Immunoassay Devices among Yemeni Population in Mukalla, Yemen

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Background: Reference intervals (RIs) refer to the quantitative data of clinical chemistry parameters accompanied by upper and lower limits, and it refers to the value or test result obtained through observation or measurement of a particular type of analyte on an adequate number of individuals. This study was aimed to establish the RIs for common seven enzymes among healthy adult Yemeni population using two different immunoassay devices.

Methods: A cross-sectional study was conducted on 400 apparently healthy Yemeni subjects were recruited from the Blood Transfusion and Research Center in Mukalla, Yemen during the period from 10th May to 30th July 2022. Serum alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP), gamma-glutamyl transferase (GGT), lactate dehydrogenase (LDH), total creatine kinase (CK), and creatine kinase-MB (CK-MB) were measured using Cobas Integra 400 and Beckman Coulter AU480 autoanalyzer.

Results: The median of serum ALT, AST, ALP, total CK and LDH activities were significantly higher in males than females. RIs of enzymes established by this study were: ALT (1 to 18 IU/L), AST (2 to 31), ALP (3 to 116 IU/L), GGT (2 to 52 IU/L), LDH (20 to 250 IU/L), Total CK (6 to 181 IU/L), and CK-MB (2 to 32 IU/L).

Conclusion: According to sex, a statistically significant difference for these parameters was noted; suggesting the need for sex specific RIs for these parameters. But no significant difference for age and geographical area. However, values of this study were closeness to the values currently used in our hospitals provided by the reagent manufactures. Further studies with larger samples are required to validate our findings.

Poster Presentation Abstracts

Abstract # 32

Methylmalonic Acidemia and Vitamin B12 deficiency in newborns

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Background: Vitamin B12 is a cofactor for adenosylcobalamin that responsible of methylmalonic acid (MMA) catabolism. Increasing in MMA in the most specific functional biomarker of B12 status. This case study aiming to demonstrate the relationship between the high detection of methylmalonic acidemia in urine and vitamin B12 deficiency.

Methods: Diagnosis and monitoring the organic acids in urine sample by a gas chromatography/mass spectrometry (GC/MS/MS) that has a qualitative method. We extract the sample manually by liquid-liquid method using ethyl acetate organic solvent.

Results: The difference between MMA peak in methylmalonic acidemia patient and patient with B12 deficiency is the absence of methylcitric acid peak that was the primary biomarker peak of methylmalonic acidemia. The MMA peak was detected at RT= 9.4. The second biomarker was propionylacylcarnitine (C3) parameter in dried blood spot (DBS) sample using liquid chromatography mass spectrometry (LC/MS/MS). C3 was >8 µmol/L, both of patients have normal C3 values that was for the first patient= 1.54 µmol/L and the second patient = 0.7 µmol/L.

Conclusion: High detection of MMA peak in urine sample without an elevation in other pathological peaks and C3 in DBS sample was normal. This pattern in commonly seen in nutritional B12 deficiency.

Poster Presentation Abstracts

Abstract # 33

The Prevalence of Metabolic Syndrome among Hadhramout University Students in Mukalla, Yemen

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Background: Metabolic Syndrome (MetS) has become one of the major challenges to public health worldwide due to its significant association with increased risk of developing type 2 diabetes mellitus and cardiovascular diseases among adolescents and adults. This study aimed to assess the prevalence of MetS among Hadhramout University Students during 2021-2022.

Methods: A total of 400 Hadhramout university students among males (241) and females (159) aged 18-26 years were recruited into a cross-sectional study during the period from 1st December 2021 to 30th September 2022. The participants were chosen from six colleges using a multistage random sample. Anthropometric measurements and blood pressure were obtained from each participant. fasting blood glucose, serum total cholesterol, triglyceride, HDL-cholesterol, and LDL-cholesterol were measured using the chemical autoanalyzer (Mindray BS-230 analyzer, Shenzhen, China). The international diabetes federation criteria were utilized in the diagnosis of MetS.

Results: The mean age of the participants was 22.45±1.69 years. Forty-six of the students (11.5%) had MetS, with significantly increased BMI (P<0.001), WC (P=0.003), SBP (P<0.001), DBP (P<0.001), blood glucose (P=0.017), triglycerides (P<0.001), and HDL-cholesterol (P=0.002). Also, participants with MetS had significantly increased central obesity (P<0.001). Males had significantly increased BMI (P=0.004), WC (P<0.001), SBP (P<0.001), DBP (P<0.001), and triglyceride (P=0.002) than female students. Moreover, perceived stress was significantly higher in female than male students (P=0.001). Females had low physical activity than male students (P<0.001). However, no significant difference among students with and without MetS for diet and sleeping habits.

Conclusion: Metabolic Syndrome is considered a public health problem among Hadhramout University students. These findings indicate the need for health promotion and prevention programs directed toward the screening, diagnosis, and management of MetS among adolescent and university students.

Poster Presentation Abstracts

Abstract # 34

Assessment of Hematological and Biochemical Parameters in Suspected COVID-19 Yemeni Patients Attending Isolation Centers in Positive and Negative RT-PCR Swabs

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Background: The coronavirus disease-2019 (COVID-19) is a highly contagious respiratory illness that is caused by SARS-CoV-2, which effected in hematological and biochemical parameters. The study aimed to assess hematological and biochemical parameters in suspected COVID-19 Yemeni patients with positive and negative RT-PCR swabs.

Methods: A total of 106 suspected adult Yemeni patients with COVID-19 were recruited into the cross-sectional study. This study was conducted at the Isolation Centers in Mukalla, Yemen, from 1st December 2021 to 1st October 2022. The study group was subdivided into two major groups: 48 negative RT-PCR swabs and 58 positive RT-PCR swabs groups. Complete blood count (CBC) was measured using CBC Sysmex auto-analyzer. Blood glucose, lipid profile, CRP, ALT, AST, LDH, and GGT were measured using Cobas Integra 400 plus analyzer. Serum ferritin was measured using Cobas e 411 analyzers. Data were analyzed by using SPSS.

Results: The majority of positive RT-PCR patients were aged equal to or greater than forty-six years (91.4%) and had diabetes (94.8%) with positive association (P<0.001; P<0.001) respectively. RT-PCR-positive patients had significantly higher hemoglobin levels (P= 0.002). WBC and RBC were significantly higher in swab-positive cases (P <0.001; P= 0,045) respectively. Neutrophils were significantly higher among swab-positive cases (P <0.001), whereas lymphocytes and eosinophils were significantly lower among swab-positive cases (P <0.001; P <0.001) respectively. Also, LDH and GGT were higher significantly among positive RT-PCR cases (P <0.001; P <0.001) respectively. CRP was significantly higher in RT-PCR-positive patients (P <0.001). RT-PCR-positive patients reported significantly higher levels of ferritin when compared to swab-negative cases (P <0.001). Ferritin was positively associated with AST (P= 0.004), ALT (P <0.001, LDH (P= 0.001), and GGT (P <0.001) in RT-PCR positive cases. Also, CRP was positively associated with AST (P= 0.032), ALT (P= 0.004), LDH (P <0.001), and GGT (P= 0.045) in RT-PCR-positive cases.

Conclusion: Clinical symptoms and hematological and biochemical parameters of COVID-19 were more frequent among patients who had RT-PCR positive results.

Poster Presentation Abstracts

Abstract # 35

Validation of Body Fluids Analysis: Interference Study

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Background: Analytical performance of the chemistry assays is mainly validated by manufacturers for analysis of serum and plasma samples and sometimes cerebrospinal fluid, but not for other body fluids. Analyzing body fluids using these assays requires analytical validation of accuracy, precision, reportable range, analytic sensitivity, and interferences as stated by College of American Pathologists (CAP) in the checklist specific for body fluids analysis. The aim of our study is to evaluate the effect of hemolysis, and high level of bilirubin and lipid on 14 Analytes (AMY, ALB, CHOL, CREA, GLU, LDH, TP, TRIG, ADA, CA, UREA, NA, K, and CL) in three different body fluids: peritoneal, synovial, and pleural.

Methods: The CLSI guidelines EP07-A2 "Interference Testing in Clinical Chemistry" was used as a reference to perform this interference study. Three different body fluid pools, including peritoneal, synovial, and pleural fluids, were first prepared. Hemolysate, bilirubin, and 20% intralipid emulsion were spiked into the three body fluid pools (< 5% volume) to prepare four known concentrations from each pool. Interference was calculated as the percent difference between spiked and no-spiked samples. Calculated interference was compared to the Total Allowable Error (TEa) for serum analysis as acceptance criteria for defining significant assay interference.

Results: ADA, K, LDH, TP and TRIG were significantly affected by hemolysis for all body fluids. Measurements of other analytes including ALB in peritoneal and pleural fluids; CREA in peritoneal fluid; CA in synovial fluid; and BILI T and CHOL in pleural fluid significantly affected by hemolysis. Bilirubin interfered with ADA, CHOL and TRIG for all body fluids. It also interfered with TP in peritoneal and pleural fluids. The influence of Lipemia showed significant change in TRIG levels for all body fluids.

Conclusion: The presented results show the effect of hemolysis, icterus and lipemia on 14 Chemistry assays in three different body fluids using CLSI guidelines EP07-A2 as a useful tool to perform the interference study in body fluids.

Poster Presentation Abstracts

Abstract # 36

New HPLC method for the measurement of Biotinidase activity in serum by using B-PABA as substrate

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Background: The aim of this study was To develop and validate a High-Performance Liquid Chromatographic Method for the determination of Biotinidase activity in serum with fluorescent detection.

Methods: In colorimetric assays, biotinidase attacks the amide linkage of the artificial substrate biotinidyl-4-aminobenzoic acid (BPABA) and releases p-aminobenzoic acid (PABA) which is converted into a purple dye by diazotization reaction. In the current method, we directly inject liberated PABA into the C18 column and quantitate using a six-point calibration curve without any coupling reaction, eliminating several potential interferences.

Results: The method is linear over the range of 5 -1000 µmol/L of PABA. The limit of detection and quantitation were 2.3 µmol/L and 5.0 µmol/L respectively. The developed method was compared with colorimetric assay and the correlation coefficient (R2) was found to be 0.999 with no significant bias. Within-run and between-run precision were less than 11.5% for four levels of quality control samples.

Conclusion: The proposed HPLC method has several advantages over the commonly used colorimetric method. It eliminates the possible interference due to the presence of aromatic amine which converts into the purple dye and increases BTD results in colorimetric assays. The present HPLC method was designed to be easy to use, sensitive, and quicker in sample preparation with a faster reaction of BTD with the substrate. The liberated PABA was separated from serum constituents on C18 column and quantitated with the six-point calibration curve. A minimum of 25µL of serum sample is required. To the best of our knowledge, no similar HPLC method has been reported before.

Poster Presentation Abstracts

Abstract # 37

Evaluation of Diagnostic Utility of Highly Sensitive Troponin I Assay for Point of Care (POCT) Devices

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Background: High Sensitive Troponin I (hs Trop I) assay is used to evaluate patients with chest pain at the emergency department and it is highly used to rule in or rule out acute myocardial infarction. The turn-around-time is very crucial for diagnosis and management. Currently hs Trop I is measured by central immunoassay analyzer. Only few point of care testing (POCT) devices are available in the market. In this study, we have evaluated two POCT devices for (hsTrop I) and compared them with the central main immunoassay analyzer.

Methods: A total of 29 blood samples were collected from 16 male and 13 females' subjects. Serum, and whole blood types were used in this study. The main immunoassay analyzer was Alinity I (Serum) from Abbott. The first POCT was Atellica VTLi (Whole blood Venous (lithium heparin)) from Siemens and the other one was TriageTrue from Quidal (whole blood Venous in EDTA). Data were collected and Statistic was done by T Test using Microsoft Excel.

Results: The values for correlation factor for Atellica VTLi and TriageTrue when compared with the main analyzer Alinity were 0.986 (p= 0.0004) and 0.9449 (p= 0.089) respectively. The slop values were 0.81and 0.66 respectively and the y-intercept values were -16.7 and 17.4 respectively. The bland altmen analysis has shown a positive bias for in both of POCT devices on the extent of Alinity which means lower values of hs Trop I on both devices. The diagnostic sensitivity and specificity were 70% and 100% for Atellica VTLi and 92% and 100% for TriageTrue.

Conclusion: This study demonstrates comparable diagnostic performance with laboratory-based assay for both hs Trop I. A key benefit of POC assays is the short turnaround time with most reporting <20 min from testing to results. Further analysis is being carried out as well as an increase in samples size.

Poster Presentation Abstracts

Abstract # 38

Lipid Metabolism Is Key to Genetic Mechanisms of Hepatocellular Carcinoma Based on Differential Gene Expression Pattern Analysis

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Background: Hepatocellular carcinoma (HCC) is a primary liver cancer with a high worldwide prevalence and poor prognosis, approximately 800 000 cases are diagnosed annually. The condition's complexity is due to various contributing factors, including obesity and non-alcoholic fatty liver disease (NAFLD). NAFLD has quickly risen as one of the leading etiologies for liver disease, and it is caused by lipid accumulation in the liver. Usually, NAFLD is an asymptomatic condition, but in some cases, it progresses to inflammation and liver damage, a condition known as non-alcoholic steatohepatitis (NASH). Metabolic reprogramming is also critically involved in the development and progression of cancer. However, the specific role of lipid metabolism dysregulated genes in NAFLD, NASH, and HCC has not been widely described yet. This study aimed to map gene signatures and pathways positively associated with HCC progression.

Methods: A total of 6 HCC tissue mRNA expression datasets were used to screen differentially expressed genes (DEGs), the overall analysis covered 909 tumor and 766 non-tumor tissue samples. Shared DEGs were used for protein-protein interaction network (PPIN) construction, followed by functional enrichment analysis. Subsequently, hub genes identification, survival curve analysis, and validation of the expression level of hub genes NAFLD and in NASH tissue samples were performed.

Results: After merging analysis results from different datasets, 64 HCC-DEGs (50 downregulated and 14 upregulated genes) were shared across the HCC datasets. 14 HCC-DEGs were identified as hub genes using PPIN analysis. These genes were functionally enriched in lipid metabolic pathways, including bile acid biosynthesis, response to fatty acids, and amino acid metabolism. Most upregulated hub genes, including the AURKA, ASPM, MCM2, PTTG1, RACGAP1, and PRC1, were associated with poor survival rates with significant gender difference mortality rates. Gene expression profiling analysis showed that 13 out of 14 hub genes could be considered as biomarkers significantly involved in HCC. The disease-associated traits analysis of hub genes showed that 65% of the reported mutations had high pathogenic prediction scores and correlations with various clinical features of HCC patients. Lastly, 10/14 (71%) of the hub genes shared the same expression pattern in NAFLD and NASH tissue samples.

Conclusion: Analysis of the altered gene expression profile of the HCC microenvironment is a valuable approach for studying the dysregulation of lipid metabolism, identification of early detection biomarkers in NAFLD/NASH patients, and hopefully new therapeutic targets.

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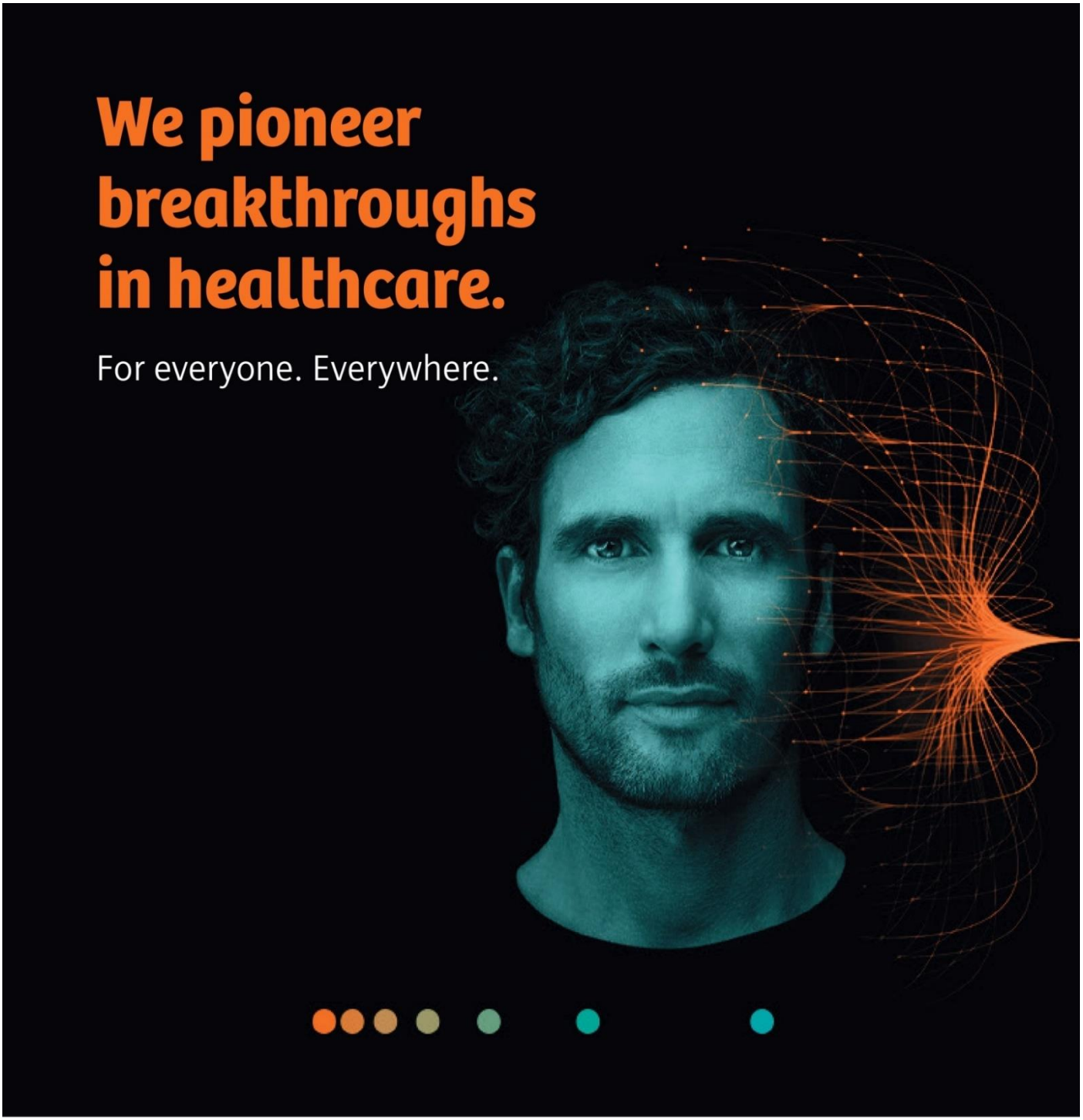

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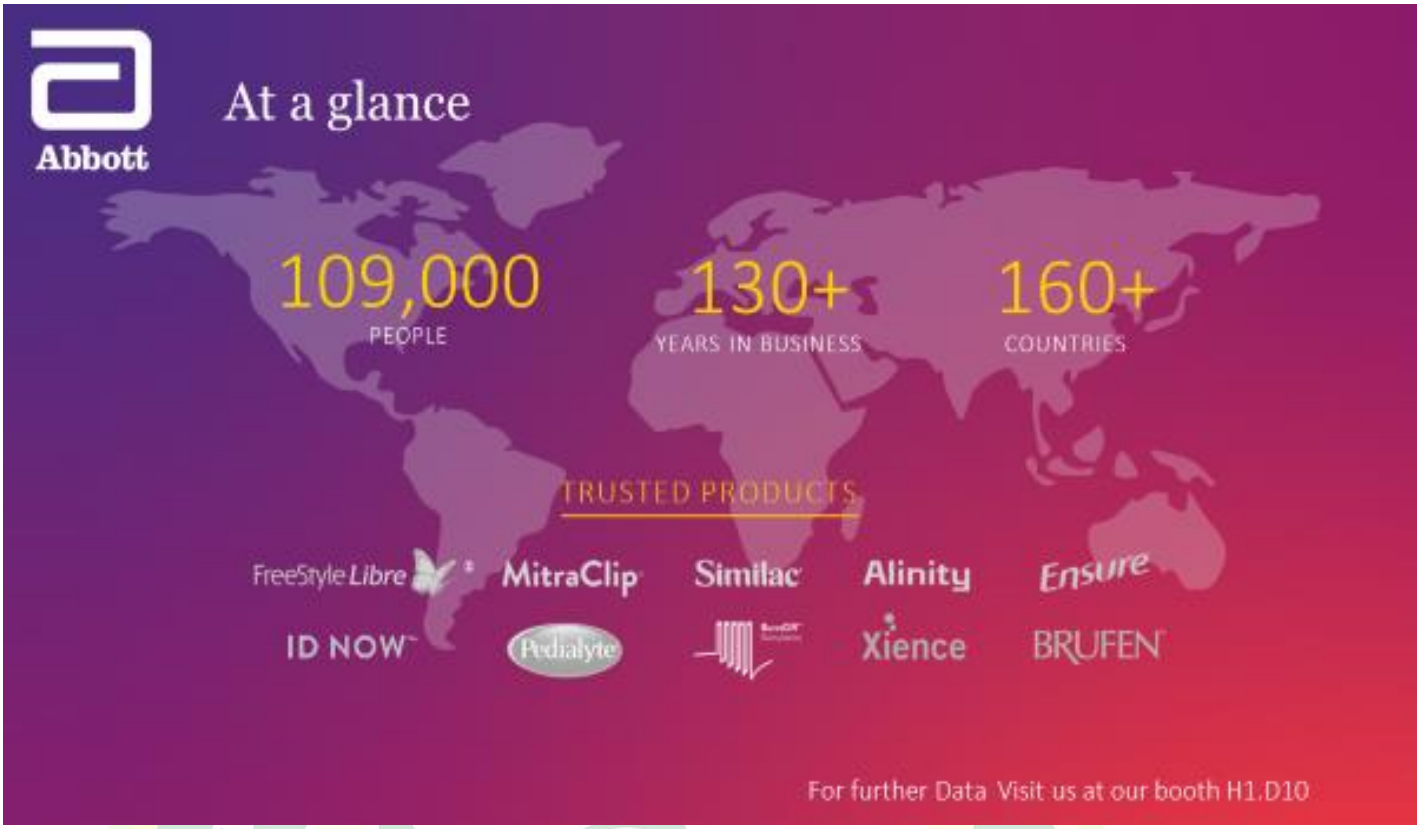
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