AMUCON 2025

7th Annual National Multidisciplinary Conference of

ASSOCIATION FOR MEDICAL UPDATES

Theme: One Health-Integrative Health Innovations

SOUVENIER-CUM COMPENDIUM OF ABSTRACT

Pre-Conference Workshop

18 Dec 2025, Dr. RMLIMS, Lucknow

Conference: 19-20 Dec 2025

Conference Venue

Ramada By Wyndham Lucknow Hotel & Convention Centre
Lucknow, Uttar Pradesh

Organized by

Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, Uttar Pradesh, India

Contact: 9005435689, 8607184136, Email: amucon2025@gmail.com, Website:

www.amuindia.org

AMJCON 2025

7th ANNUAL NATIONAL MULTIDISCIPLINARY CONFERENCE OF

ASSOCIATION FOR MEDICAL UPDATES

Theme : One Health-Integrative Health Innovations

PRE CONFERENCE WORKSHOPS | 18 DEC. 2025 | RMLIMS LUCKNOW, U.P.

19 | 20 DEC. 2025

Conference Venue :

RAMADA BY WYNDHAM LUCKNOW HOTEL & CONVENTION CENTRE

LUCKNOW, UTTAR PRADESH

Organized by : Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, Uttar Pradesh

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AMUCON 2025

INVITATION

It gives us great pleasure to invite you to the **7th Annual National Multidisciplinary Conference, AMUCON 2025**, organized by the **Association for Medical Updates**. This year, we gather under the theme **"One Health, Integrative Health Innovations,"** a theme that reflects not just a scientific movement, but a shared vision for healthier communities, stronger systems, and a more connected world.

Healthcare today is evolving faster than ever, and AMUCON 2025 is our way of coming together for clinicians, researchers, educators, students, and industry partners, to learn from one another and to shape this evolution thoughtfully. We hope this conference becomes a space where ideas flow freely, collaborations begin, and new perspectives emerge.

Over the course of the event, we will explore how diagnostic and clinical advancements, technological innovations, and multidisciplinary teamwork can meaningfully improve lives. Our sessions are designed to encourage conversation, curiosity, and collective problem-solving.

More than anything, AMUCON 2025 is an opportunity for all of us to reconnect—with our peers, with our purpose, and with the inspiring spirit of medical progress.

We warmly welcome you to be part of this journey. Your presence will enrich the discussions, strengthen the network we are building, and make this year's conference truly special.

We look forward to hosting you at AMUCON 2025 and sharing an enriching, memorable experience together.

Prof (Dr.) CM Singh
Director, Dr. RMLIMS

Prof. (Dr.) Pradyumn Singh
Dean, Dr. RMLIMS

Prof. (Dr.) Vikram Singh
CMS, Dr. RMLIMS

Dr. Manish Kumar Singh
Organising Chairman

Dr Manish Raj Kulshrestha
Organising Secretary

Dr Balveer S. Gurjar
President, AMUCON - 2025

प्रो. (डॉ.) सी0एम0 सिंह
निदेशक
Prof. (Dr.) C.M. Singh
MBBS, MD (Com Med), FAMS, FIPHA, FRSPH, FCWMA (UK)
Professor, Community & Family Medicine
Director

डॉ0 राम मनोहर लोहिया आयुर्विज्ञान संस्थान
विभूति खण्ड, गोमती नगर, लखनऊ – 226010
Dr. Ram Manohar Lohia Institute of Medical Sciences
Vibhuti Khand, Gomti Nagar, Lucknow- 226010
(An Autonomous Institute under U.P. State Government)
Phone : 0522 – 6692000, 6692001, 6692120

Foreword by the Director

Dear Delegates,

I am delighted to extend a warm welcome to all the participants to the AMUCON-2025, organized from 18th to 20th December 2025 under the auspices of the Departments of Biochemistry and Community Medicine, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow.

The chosen theme, "One Health: Integrative Health Innovation," resonates deeply with our collective mission to foster collaboration across disciplines and explore holistic, sustainable approaches to health. In an era where human, animal, and environmental well-being are intricately interlinked, this conference stands as a timely platform to exchange ideas, share research, and inspire innovation.

I am pleased that the conference is preceded by a series of hands-on pre-conference workshops at Dr. RMLIMS, focusing on cutting-edge technologies and contemporary research tools—from mass spectrometry and next-generation sequencing to artificial intelligence and systematic reviews. These learning opportunities reflect our institute's commitment to capacity building and translational excellence in biomedical sciences.

I commend the organizing committee for curating a diverse and intellectually enriching scientific program. I am confident that AMUCON-2025 will serve as a vibrant confluence of ideas, collaboration, and inspiration for all participants.

I extend my best wishes for the grand success of AMUCON-2025 and look forward to meaningful deliberations that advance the vision of 'One Health' for a healthier and more sustainable future.

Prof. (Dr.) C. M. Singh

MESSAAGE

DR. MANISH RAJ KULSHRESTHA

Dear Delegates and Esteemed Colleagues,

It gives me immense pleasure to welcome you all to the 7th Annual AMUCON 2025, being organized under the auspices of the Departments of Biochemistry and Community Medicine, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, Uttar Pradesh.

The theme for this year's conference, 'One Health: Integrative Health Innovations,' captures the essence of a modern, interconnected approach to healthcare—where human, animal, and environmental health are recognized as interdependent. Through this conference, we aim to provide a stimulating academic platform that promotes knowledge sharing, interdisciplinary dialogue, and collaborative research among experts, educators, and learners from across the country.

The inclusion of pre-conference hands-on workshops at RMLIMS adds immense value by offering participants an opportunity to gain practical exposure to cutting-edge tools and techniques such as mass spectrometry, next-generation sequencing, artificial intelligence, and systematic review methodologies. These workshops truly reflect our commitment to fostering innovation and building research capabilities among young scientists and professionals.

I wish you all a fruitful, engaging, and memorable experience in the city of Lucknow, renowned for its cultural elegance and gracious hospitality.

May AMUCON 2025 stand as a beacon of academic excellence and collaborative progress.

With warm regards,

Dr. Manish Raj Kulshrestha
Professor, Department of Biochemistry
Organising Secretary, AMUCON 2025
Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow

MESSAGE

DR. MANISH KUMAR SINGH

Dear Delegates and Esteemed Colleagues,

It gives me immense pleasure to welcome you all to the 7th Annual AMUCON 2025, being held at Ramada by Wyndham Lucknow Hotel & Convention Centre, under the auspices of the Departments of Community Medicine and Biochemistry, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow.

The theme, "One Health: Integrative Health Innovations," truly reflects the evolving paradigm of healthcare. This conference aims to serve as a vibrant forum for knowledge exchange, research collaboration, and cross-disciplinary dialogue, paving the way for more holistic and sustainable health solutions.

I am delighted that AMUCON 2025 also features a series of pre-conference workshops at RMLIMS, offering hands-on training in cutting-edge technologies and methodologies. These initiatives not only enhance academic excellence but also empower young professionals to translate scientific insights into impactful practice.

I extend my best wishes to all delegates and contributors for a stimulating and memorable experience at AMUCON 2025. Together, let us make AMUCON 2025 a memorable academic milestone and a celebration of collaborative learning.

With warm regards,

Dr. Manish Kumar Singh
Professor, Community Medicine
Organising Chairperson, AMUCON 2025
Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow

MESSAGE

DR. APURVA AGRAWAL

The Association for Medical Updates (AMU) was founded on the principle that the future of medicine lies in integration. Our mission has always been to break down the silos between medical disciplines, fostering a collaborative environment that promotes truly holistic healthcare.

I would like to extend my heartfelt congratulations to the organizing team at Dr. RMLIMS for their exceptional leadership in carrying this vision forward. By hosting this convention, they have demonstrated a commitment to excellence that reflects the very best of our medical community.

I am confident that AMCUCON 2025 will serve as a powerful platform for innovation, instilling new energy and providing deep clinical insights to every participant. It is through these shared academic endeavors that we refine our skills and improve patient outcomes.

I deeply appreciate the tireless efforts and meticulous planning invested by the organizing committee. It is an honor to extend my warmest best wishes for the grand success of AMCUCON 2025 in the historic city of Lucknow.

Warm regards

Dr. Apurva Agrawal
Secretary General, Association for Medical Updates (AMU)
Professor & Head
Department of Pharmacology
RNT Medical College, Udaipur, Rajasthan

Dear Delegates and Esteemed Colleagues

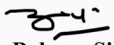
On behalf of the organizing committee and as the Organizing President, it is my privilege to welcome you to the 7th Annual AMUCON 2025. This year's conference is being organized under the joint auspices of the Departments of Biochemistry and Community Medicine, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow at the Ramada By Wyndham Lucknow Hotel & Convention Centre, Lucknow.

The conference theme, 'One Health: Integrative Health Innovation', has been carefully curated to reflect the evolving landscape of healthcare and research. Our comprehensive scientific program brings together distinguished speakers, insightful sessions, and interactive discussions, fostering a vibrant platform for knowledge exchange, interdisciplinary collaboration, and innovation.

We are committed to providing every delegate with a rewarding and memorable experience. The city of Lucknow, known for its rich culture, gracious hospitality, and architectural heritage, offers a charming backdrop to this academic event. I encourage you to engage fully with the scientific deliberations and also take time to experience the elegance and warmth of this historic city.

Your active participation and contributions are vital to the success of AMUCON 2025, and we eagerly look forward to welcoming you to this celebration of science, learning, and collaboration.

Warm regards,



Dr. Balveer Singh
Organizing President, 7th AMUCON-2025
Associate Professor, Department of Biochemistry
SMS Medical College and Hospital, Jaipur

MESSAGE

DR. ASHISH SHARMA

Greetings to all the esteemed delegates and colleagues,

It gives me immense pride and pleasure to welcome you all to AMCUCON 2025 in the historic city of Lucknow. Since its inception, the Association for Medical Updates (AMU) has remained steadfast in its mission to bridge the gap between various medical specialties. We believe that the future of medicine lies not in isolation, but in the seamless integration of knowledge to provide truly holistic patient care.

The theme of this year's conference reflects our commitment to staying at the forefront of clinical excellence and scientific innovation. As we gather at Dr. RMLIMS, we are reminded that medical education is a lifelong journey. This convention is designed to be a vibrant platform where seasoned experts and young medical professionals can exchange ideas, challenge existing paradigms, and explore the latest advancements in healthcare.

I would like to express my deepest appreciation to the Organizing Committee at Dr. RMLIMS for their tireless dedication and hospitality in bringing this event to life. Their pursuit of excellence ensures that AMCUCON 2025 will be a landmark academic feast.

I am confident that the deliberations, workshops, and scientific sessions over the coming days will instil a renewed sense of purpose and provide invaluable insights to all participants.

I wish the conference every success and hope that your stay in Lucknow is both academically enriching and personally memorable.

Long Live AMU!

Dr. Ashish Sharma
President, Association for Medical Updates (AMU)
Professor & Head
Department of Biochemistry, GMCH, Udaipur

AMJCON 2025

The Dr. Ram Manohar Lohia Institute of Medical Sciences (RMLIMS), Lucknow, Uttar Pradesh, is a premier super specialty autonomous medical teaching institute established in 2006. Dr. RMLIMS provides cutting-edge clinical services across a wide spectrum of disciplines, including Biochemistry, Oncology, Cardiology, Gastroenterology, Nephrology, and Neurosurgery etc. As an academic institution with State University status, the Institute is committed to excellence in medical education and research, offering a full range of degrees, including MBBS, MD, MS, DM, MCh, and Ph.D. programs, and houses advanced facilities like the State Referral Centre for Laboratory Investigations (SRCLI), establishing itself as a vital center for clinical care, education, and medical innovation in Central Uttar Pradesh.

Association for Medical Updates" (AMU), which is one of most revered associations amongst medical colleges, private practitioners, hospitals and diagnostic laboratories is working with an aim of spreading information and awareness regarding advancements in therapeutics and diagnostics via conducting various educational and scientific programs throughout the country.

AMUCON 2025

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Dr. Manish Singh

Organizing Secretary
Dr. Manish Raj Kulshrestha

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CONFERENCE SPEAKERS

Dr. Pratibha Gavel
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Professor,
Biochemistry
CMC Ludhiana

Dr. Archana Singh
Professor,
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AIIMS New Delhi

Dr. Manodeep Sen
Professor,
Microbiology
Dr. RMLIMS, Lucknow

Dr Nikhil Gupta
Professor,
Medicine
Dr. RMLIMS Lucknow

Dr Hemant K Agarwal
Professor,
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Dr.RMLIMS, Lucknow

Dr PK Das
Professor,
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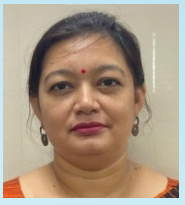
Dr.RMLIMS Lucknow

Dr Alok Shrivastava
Professor,
Urology
Dr.RMLIMS, Lucknow

Dr Anshuman Pandey
Professor,
GI Surgery
Dr. RMLIMS Lucknow



Dr Binita Goswami
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Biochemistry
MAMC, Delhi

Dr Dinesh Bandhyal
Professor,
Pharma
CMC Ludhiana

Dr Arun Harith
Professor,
Biochemistry
Amritha Faridabad

Dr Yashwant Kumar
Professor,
Immunopathology,
PGIMER, Chandigarh

Dr Arun Pande
Director, Endocrinology
Lucknow Endocrine Diabetes
& Thyroid Clinic

Dr. Mayank J. Gupta
Director
Kanpur Chest &
Allergy Centre

Dr Manish Gutch
Director,
Endocrinology
Medanta, Lucknow

Dr Sandip Mukhopadhyay
Scientist E
(Deputy Director)
ICMR - NRBI, Kolkata

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AIIMS New Delhi

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Dr. RMLIMS, Lucknow

Dr Namrata Rao
Professor (Jr.),
Nephrology
Dr. RMLIMS, Lucknow

Dr Krishna K. Yadav
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Paediatrics
Dr. RMLIMS, Lucknow

Dr Vikas Sharma
Professor (Jr.),
Surgical Oncology
Dr. RMLIMS, Lucknow

Dr Sai Saran
Professor (Jr.),
Anaesthesia
SGPGI, Lucknow

Dr Sanjeet Singh
Professor (Jr.),
Urology
Dr.RMLIMS, Lucknow

Dr. Abdul Qavi
Professor (Jr. Grade),
Neurology
Dr.RMLIMS Lucknow

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CONFERENCE SPEAKERS

Dr Shrimanjunath Sankanagoudar
Additional Professor
AIIMS Jodhpur

Dr. Raghvendra Linghaiya
Additional Professor,
Pathology
SGPGI Lucknow

Dr. Manish Raj Kulshrestha
Professor Jr. & Head
Department of Biochemistry
Dr. RMLIMS, Lucknow

Dr Arvind Chaudhary
CEO, Cordon Genomics

Dr Swarup Shah
Senior Molecular Scientist
Hinduja HospitalMumbai

Dr Jayeta Bhadra
Associate Professor,
Dept. of Biochemistry
Vallabhbhai Patel Chest
Institute, Delhi

Dr Kamna Singh
Associate Professor &
HOD Biochemistry
SNMC Agra

Dr Laraib Sheikh
Assistant Professor,
Anaesthesia
SGPGI Lucknow

Dr Sankalp Jha
Assistant Professor
Physiology,
IMS BHU

Dr Rupita Kulshrestha
Assistant Professor,
Obstetrics & Gynaecology
Dr.RMLIMS, Lucknow

Dr Ankesh Gupta
Assistant Professor,
Infectious Medicine
SGPGI, Lucknow

Dr. Amit Malviya
Assistant Professor,
Dept. of Anaesthesia
AIIMS Bhopal

Dr Vibhav Nigam
Assistant Professor,
Biochemistry
KGMC, Lucknow

Dr Kali Charan Das
Assistant Professor,
Anaesthesia
Incharge Central ICU
AIIMS Raebareli

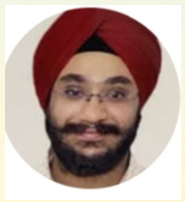
Dr. Pradeep Jingar
Assistant Professor
CEO, Lab Works Diagnostics
Founder,
Clarirynth Healthcare, Jaipur

Dr Taha
Consultant Allergologist
Govt. JLNM Hospital
Srinagar

Dr Somya Shrivastava
Consultant,
Shanya Scans &
Theranostics,
Lucknow

Dr Basabdutta Samanta
Safety Physician
IQVIA, Burdhwan

Dr Altaf Ahmed Mir
Additional Professor
Biochemistry,
AIIMS, Raebareli



Dr Amarjot Singh
Professor (Jr.)
Department of Surgery
Dr. RMLIMS Lucknow

Dr Suryakant
Professor & Head
Deptt. Of Respiratory Medicine
KGMU, Lucknow

Dr Nida Khan
Consultant Medicine
Integral Institute of Medical
Sciences and Research

Dr Anupam Parashar
Dean (Research), Professor &
Head,
AIIMS, Bilaspur (HP)

Dr. Manish Kumar Singh
Professor
Community Medicine
Dr. RMLIMS, Lucknow

Dr. Piyush Upadhyay
Professor (Jr) & Head
Pediatric Hepatology &
Gastroenterology
Dr. RMLIMS, Lucknow

AMJCON 2025

CONFERENCE SECHUDULE

Day 1: 19th December 2025

18-12-2025 (Workshop)

Day 1: 19th December 2025

	Khorana Hall		Ramachandran Hall		Subbarow Hall		Gopalan Hall
Session-1	**Data, Diligence, and Diagnostics: The Lab Trinity**	**Speaker**	**Diabetes care 360 degrees: Technology, Therapy andTeamwork**	**Speaker**	**Medical Education & Reforms**	**Speaker**	**PG Oral Presentation -1** (Moderator: Dr Reena Rani)
9:00-9:30 AM	Transformimg Clinical Judgement Through Real Time Surveillance of Preanalytical Influence	Dr Kamna Singh	Diabetes Prevention and Lifetime Interventions	Dr Anupam Parashar	Curriculum Updates: UG & PG Courses in India	Dr Dinesh Bandhyal	
9:30-10:00 AM	Numbers lie: Be Aware & Beware	Dr Arun Harith	The Clinical Face of Monogenic Diabetes: Patterns & Predictors	Dr Arun Pande	From Station to Nation: OSCE/OPSE Building Better Doctors	Dr Ajay Kumar	
10:00-10:15 AM	**Showcase Research: Analytical Crossroads: HbA1c Evaluation by Immunoturbidimetry and HPLC in Non-Dialysis CKD**	Dr Vibhav Nigam	**Showcase Research: Heavy Metals, Heavier Consequences: Association of Arsenic and Nickel with Metabolic Dysfunction in the Indo-Gangetic plain**	Dr Nikhil Gupta	**Showcase Presentation: An unconventional carrier Path: The Road Less Taken**	Dr Basabdutta Samanta	
10:15-10:45 AM	Corporate session -1		Corporate session -3		**Panel Discussion:** Assessment Reforms in Medical Education (Panel Moderator: Dr Navbir Pasricha)	Dr Bharti Uppal, Dr Medha Mathur, Dr Umesh Yadav,Dr Jyoti Chopra	
10:45-11:00 AM	**High Tea**						
Session 2	**Next generation genetics**		**Advances in Immunization: Integrating Next Generation Vaccines into Modern Public Health Practice**		**The Fat Truth: Genes, Growth, and Gut Decisions**		**PG Oral Presentation -2/ PG Poster Presentation (Moderator: Dr Reena Rani)**
11:00-11:30 PM	From illusion to inclusion: NGS in Everyday Medicine	Dr Arvind Chaudhary	Recent Updates on Animal Bite Management	Dr Manish Kumar Singh	Childhood Obesity: A Growing Concern	Dr Krishna Kumar Yadav	
11:30-12:00 PM	Droplets don't lie: The role of ddPCR in precise molecular strike	Dr Binita Goswami	HPV vaccination: Protecting Women Across Generations	Dr Rupita Kulshrestha	Metabolic Makeover: The New Era of Bariatric Surgery	Dr Anshuman Pandey	
12:00-12:15 PM	**Showcase Research: Exosomes in Alzeimer's Disease: The gateway of neuronal research**	Dr Abdul Qavi	Immunization to Intervention: A Unified Management Framework for Hepatitis B	Dr Piyush Upadhyaya	**Showcase Research: Insight into Adipose Transcriptomics & Associated Co-morbidities**	Dr Rakhee Yadav	
12:15-12:30 PM	Corporate session -2		Corporate session -4				
Session 3	**Exposomics: The Missing Puzzle Piece in Chronic Diseases**		**Night's Breath, Day's Burden: Sleep Breathing Disorders**		**Endocinal Enigma:Surge to Surgery**		**PG Oral Presentation-2/ PG Poster Presentation (Moderator: Dr Astha Sachan, Dr Jasmeen Gupta)**
12:30-1:00 PM	Exposomics: The Unexplored Toxins	Dr Swarup Shah	Breathing at Night: Pathophysiology and Detection	Dr Sankalp Jha	From Crisis to Control : Evolving Frontiers in Pheochromocytoma Management	Dr Sunil Singh	
1:00-1:30 PM	Mass spectrometry meets exposomics: Mapping the invisible environment	Dr Raghvendra Linghaiya	Therapeutic Strategies for OSA: Current Practices and Emerging Approaches	Dr Hemant K Agarwal	Robotics, Endoscopy & AI: Future of Thyroid Surgery	Dr Amarjot Singh	
1:30-1:45 PM	**Showcase Research: Toxic Trails: Linking Environment and CKD**	Dr Namrata Rao	**Panel Discussion:** The Hidden Burden of OSA (Panel Moderator: Dr Anil Kumar Singh)	Dr Ashish Jha, Dr Ajay Kumaar Verma, Dr Ashish Chandra Agarwal	Hormonal whishpers, Diagnostic Roars: Unveiling the Sinister	Dr Altaf Ahmed Mir	
1:45 -2:30 PM	**Lunch**						

AMJCON 2025

CONFERENCE SECHUDULE

Day 1: 19th December 2025

	Khorana Hall		Ramachandran Hall		Subbarow Hall		
Session 4	**Monitors, Molecules, Meaning: The Modern ICU Paradigm**		**From Reactions to Recognition: Hypersensitivity to Self-reactivity**		**High-Resolution Surgical Dexterity**		
2:30-3:00 PM	Acid-Base-ics: Cracking the ABG Code in Critical Care	Dr Kali Charan Das	Cracking the Allergy Code: Diagnose right, Manage Bright	Dr Mayank J. Gupta	Next-level Robotic Surgery: Minimally Invasive Appoaches and Enhanced Recovery	Dr Alok Shrivastava	**PG Quiz (Moderator - Dr Astha Sachan, Dr Jasmeen Gupta)**
3:00-3:30 PM	Precision Oxygen: The Right dose, The Right Device	Dr PK Das	When Medicine Turn Foe: Unraveling Drug Allergy	Dr Taha Ashraf Qurashi	Flurescent Frontiers: Mapping Tumors with ICG	Dr Vikas Sharma	
3:30-3:45 PM	Beyond The ECG: Calcium & Magnesium Mechanistics in Shaping Cardiac Resilience in ICU	Dr Laraib Sheikh	Smog to Systemic Disease: Health Effects of Air Pollution in India	Dr Suryakant	Groundbreaking Innovation in Renal Transplant Technologies	Dr Sanjeet Singh	
3:45-4:15 PM	Biochemical Signatures of The Critically Ill: From Diagnosis to Prognosis	Dr Sai Saran	Antibody Signatures in Systemic Autoimmunity	Dr Yashwant Kumar	-		
4:15-4:45 PM	ICU Continuous Glucose Monitoring (ICU-CGM)	Dr Manish Gutch	-		-		
6:00-6:30 PM	**Corporate Quiz: The Faster, The Winner**						
6:30-7:30 PM	**Inaugration Ceremony & Cultural Activities**						
7:30 PM onwards	**Dinner**						
Day 2: 20th December 2025							
8:00-9:00 AM	**Breakfast**						
	Khorana Hall		**Ramachandran Hall**		**Subbarow Hall**		**Gopalan Hall**
Session-1	**Advanced Diagnostic Techniques**				**When Machines Think Doctors Thrive: AI in action**		
9:30-10:00 AM	Clear Seperations, Clearer Detection: Mass Spectrometry in TDM	Dr Pratibha Gavel			Monocyte subset Dynamics in TB Resistance	Dr Archana Singh	**Faculty Presentations (Oral)**
10:30-10:30 AM	**Showcase Presentation: Principles that Power the Lab: People, Process & Performance**	Dr Manish Raj Kulshrestha	-		Newer Drugs, Shorter Regime in MDR TB Management	Dr Nida Khan	
10:30-11:00 AM	**Panel Discussion: Evolving Methodologies in Clinical Laboratories (Panel Moderator: Dr Snigdha Singh)**	Dr Amarpreet Kaur, Dr Amit Samadhiya, Dr Rinchu Loomba, Dr. Sojit Tomo,			Showcase Presentation: Racing Against Time: Advance Investigations for Detecting Bacterial Sepsis	Dr Manodeep Sen	
					Decoding The Mycotic Mystry: Emerging Tools in Early Fungal Detection	Dr Ankesh Gupta	
11:00-11:30 AM	**High Tea**						
Session-2	**Womb, World & Wellness: Genes, Jabs and Invisible Toxins**				**Infectious Intelligence: Evolving Battles between Microbes and Medicine**		**AMU STAR Presentations**
11:30-12:00 PM	Markers of Motherhood: Windows to Two Lives	Dr Shrimanjunath Sankanagoudar			Code to Cure: AI transforming the Future of Health	Dr Pradeep Jingar	
12:00-12:30 PM	Decoding the Fetal Genome: Advances in Prenatal Screening	Dr Somya Shrivastava	-		AI Research and Ethics- Balancing Innovation with Responsibility	Dr Amit Malviya	
12:30-12.45 PM	**Showcase Research: Tiny particles, Big Consequences: Microplastics and Reproductive Health**	Dr Jayeeta Bhadra			**Large Language Models in Academic writing**	Dr Sandip Mukhopadhya	
12.45 - 1.00 PM							
1:00 -1:30 PM	**Valdectory Function**						
1.30 - 2.00 PM	**LUNCH**						

AMJCON 2025

WORKSHOPS: 18th DECEMBER 2025

Venue: **Demonstration Hall, Department of Biochemistry,**
First Floor, Academic Block, RMLIMS, Lucknow

- **Hands-on Workshop on ICP-MS**
- **Hands-on Workshop on LC-MS/MS**
- **Hands-on Workshop on NGS-Library Preparation and Data Analysis**
- **Hands-on Workshop on Basic Cardiac Life Support Skills**
- **National Workshop on Systematic Review and Meta Analysis**
- **Artificial Intelligence in Medical Research: Hands on Applications**

ACADEMIC ACTIVITIES

- SYMPOSIUM
- PAPER PRESENTATION
- POSTER PRESENTATION
- PANEL DISCUSSION
- QUIZ COMPETITION

ORATION & AWARD

- YOUNG SCIENTIST AWARD
- UTKRISHT SEVA SAMMAN
- LIFE TIME ACHIEVEMENT AWARD
- Dr. NUTAN BEDI MEMORIAL AWARD
- Dr. F.S. MEHTA ORATION AWARD
- AMU - STAR AWARD
- BEST PAPER AWARD
- BEST POSTER AWARD

PAPER AND POSTER PRESENTATION (Registration is Mandatory)

LAST DATE OF ABSTRACT SUBMISSION : **31st AUGUST 2025**

REGISTRATION FEES DETAILS

REGISTRATION WITHOUT ACCOMMODATION

Registration Category	Early Bird (31st May)	Regular Registration (30th Sept.)	Spot Registration
PG AMU Member #	` 4,000	` 5,000	` 6,000
PG AMU Non Member#	` 4,500	` 5,500	` 6,500
Faculty AMU Member	` 5,000	` 6,000	` 7,000
Faculty Non AMU Member	` 6,000	` 7,000	` 8,000
Spouse Delagate*	` 3,000	` 4,000	` 5,000
AMU Member Overseas ##	` 10,000	` 12,000	` 16,000
AMU Non Member Overseas ##	` 12,000	` 15,000	` 18,000

ACCOUNT DETAILS

ACCOUNT : ASSOCIATION FOR MEDICAL UPI
ACCOUNT NO. : 6935835162
BANK : Indian Bank, Manvakheda, Udaipu
IFSC CODE : IDIB000M251

Abstract of Speakers

Exosomes in Alzheimer's Disease: The gateway of neuronal research

Dr. Abdul Qavi

Additional Professor, Department of Neurology, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow

RE1-silencing transcription factor (REST) is recognized as a key master transcriptional regulator involved in neuronal protection and homeostasis. REST facilitates the clearance of amyloid-β (Aβ) and tau proteins and is known to be markedly reduced in the neurons of patients with Alzheimer's disease (AD). Since Aβ and tau are well-established biomarkers of AD, with elevated phosphorylated tau (p-tau) and total tau (t-tau) indicating increased neurofibrillary pathology, alterations in REST expression may contribute to disease progression. Extracellular vesicles (EVs), particularly exosomes of endocytic origin released by virtually all cell types, can cross the blood–brain barrier and thus provide a minimally invasive platform for detecting central nervous system biomarkers. This pilot case–control observational study evaluated the potential of neuronal-derived EVs as biomarkers for AD and explored the relationship between exosomal Aβ/tau levels and REST gene expression.

In the study 55 patients diagnosed with probable or possible AD according to DSM-5 and NINCDS-ADRDA criteria were included. Neuronal-derived EVs were isolated and confirmed using standard EV markers (CD81, TSG101, CANX) and brain-specific markers (L1CAM, ENO2, MAPT). AD patients demonstrated significantly elevated levels of Aβ1-40, Aβ1-42, total tau, and pT181 compared with controls. Probable AD cases showed increases in all four biomarkers, while possible AD cases showed significant elevations in Aβ1-42 and total tau.

REST gene expression was significantly downregulated in AD, with a 0.28-fold decrease in probable AD and a 0.40-fold decrease in possible AD. REST levels exhibited a strong negative correlation with Aβ and tau accumulation in EVs. Biomarker levels increased progressively with clinical AD severity.

These findings support neuronal-derived EVs as promising non-invasive biomarkers for early AD detection and disease monitoring. REST downregulation may serve as a complementary molecular indicator of AD pathology.

From Station to Nation: OSCE/OSPE Building Better Doctors

Dr. Ajay Kumar

Department of Biochemistry, CMC Ludhiana

Objective Structured Clinical Examinations (OSCE) and Objective Structured Practical Examinations (OSPE) have become essential tools in modern medical education, designed to assess competencies in a structured, transparent, and learner-centered manner. This session will revisit the fundamentals of OSCE and OSPE—their purpose, design, and role in developing clinical, procedural, and analytical skills among medical students. It will also address common misconceptions, such as equating OSCE/OSPE with traditional 'spotters' or restricting OSCE to clinical disciplines and OSPE to basic sciences. By clarifying these misunderstandings, the talk will emphasize how these assessment formats promote integrated, competency-based learning across the entire medical curriculum.

While understanding the theoretical framework of OSCE and OSPE is crucial, their true value emerges only when they are put into practice. Implementing these tools often reveals practical challenges—ranging from station design and logistics to examiner training and standardization—that may not be apparent during planning. This session will highlight how engaging in hands-on execution provides deeper insights into these challenges and ultimately strengthens the assessment process.

Ultimately, the session will explore how well-designed OSCE/OSPE stations contribute not only to individual skill development but also to the broader healthcare system. By ensuring that future doctors are trained and assessed through robust, objective, and skill-focused methods, OSCE/OSPE serve as foundational steps in strengthening national healthcare quality. As each station builds a more competent learner, the cumulative impact is the development of better doctors for the nation.

Number Lie: Be Aware and Beware

Dr. A. K. Harith

Professor & Head, Department of Biochemistry and Molecular Biology, Amrita School of Medicine, Faridabad

Clinical biochemistry in the recent few years has seen a lot of automation and improvement in Robotics. Also, Quality Control and Accreditation has impacted the way of working in a clinical laboratory in such a way, that the numbers generated by the analysers are correct, and has installed a sense of pseudo-confidence in the clinicians that they can interpret the results and manage patients without the help of the Clinical Biochemist. Through this presentation I will be highlighting a number of clinical situations where the number generated by the analyser was correct, reproducible in any other laboratories, and yet it did not correlate with the clinical profile of the patient. This is what I call a lie. Such lie significantly affecting the clinical management and at times impacts patient safety.

In the talk, I will also highlight, how to suspect such 'Lies' and safeguard ourselves from them. With a proper collaboration with the Clinical Biochemist these issues can be resolved, and the patient safety not be impacted. Through this presentation I would be stressing on the requirement being aware of the fact that "Numbers Lie" One should be aware of it and beware of it.

Hormonal Whispers, Diagnostic Roars: Unveiling the Sinister

Dr. Altaf Ahmad Mir

Professor (Jr. Grade), Department of Biochemistry, All India Institute of Medical Sciences, Raebareli, U.P.

Endocrine disorders frequently begin with subtle, nonspecific, and slowly progressive clinical manifestations that are easily overlooked in routine practice. These early "hormonal whispers" often mimic common physiological or psychological states, leading to delayed recognition of potentially life-threatening conditions. With advancements in clinical biochemistry, subtle hormonal deviations can now be detected with high precision, transforming early, ambiguous presentations into definitive diagnostic evidence.

This presentation examines the diagnostic spectrum from early subclinical hormone imbalances to apparent endocrine disorders. Through illustrative conditions—including hypothyroidism, Cushing syndrome, Addison's disease, pheochromocytoma, and polycystic ovary syndrome—we demonstrate how sensitive immunoassays, steroid profiling by mass spectrometry, salivary biomarkers, and dynamic endocrine function tests reveal definitive biochemical signatures long before clinical deterioration occurs. The discussion highlights the critical role of laboratory medicine in deciphering subtle hormonal dysregulation, preventing crisis states, and mitigating long-term cardiometabolic and systemic complications.

Integrating clinical vigilance with advanced diagnostic platforms enables clinicians to detect serious endocrine disorders early, thereby enhancing outcomes and minimizing morbidity. Recognizing and interpreting these "hormonal signals" remains essential for precision medicine and effective endocrine management.

Next Level Robotic Surgery: Minimal Invasive Approach and Enhanced Recovery

Dr. Alok Srivastava

Professor, Department of Urology, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, Uttar Pradesh

Next-level robotic surgery represents a transformative advancement in modern medical practice, offering unprecedented precision, control, and adaptability in diverse surgical environments. As healthcare systems continue to prioritize patient-centered outcomes, robotic-assisted procedures have emerged as a powerful approach to reducing surgical trauma and improving postoperative recovery. These next-generation systems integrate-

- Advanced imaging
- Artificial intelligence–supported decision tools
- Haptic feedback mechanisms
- Miniaturized robotic instruments (Nanobotics) to enable surgeons to perform complex tasks through extremely small incisions.

A defining hallmark of next-level robotic surgery is its enhanced visualization capability, allowing surgeons to access magnified, high-definition, three-dimensional views of anatomical structures. This leads to what is popularly called millimeter by millimeter by precision with finely articulated instruments capable of sub-millimeter movements, facilitates meticulous dissection and suturing in confined or difficult-to-reach spaces.

Additionally, machine-learning empowered systems can assist in planning optimal surgical pathways, predicting potential complications, and standardizing surgical performance across practitioners with different experience levels. The precision and consistency enabled by robotics contribute directly to shorter operative times, reduced hospital stays, and expedited patient rehabilitation.

Moreover, rapid innovations in tele-robotics and remote operation (telesurgery) are expanding access to specialized surgical expertise, potentially bridging gaps in healthcare delivery across regions. As robotic platforms become more compact, cost-efficient, and user-friendly, their integration into routine clinical practice is expected to accelerate.

Robotics, Endoscopy & AI: The Future of Thyroid Surgery

Dr. Amarjot Singh

Department of General Surgery, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow

Traditional thyroid surgery usually involves open neck incisions, which, while effective, often leave noticeable scars and carry risks such as hypoparathyroidism and damage to the recurrent laryngeal nerve (RLN). The integration of robotic technology, endoscopic methods, and artificial intelligence (AI) is ushering in a shift toward minimally invasive, scar-free procedures that enhance surgical precision, reduce recovery time, and improve cosmetic results in both benign and malignant thyroid conditions.

This review highlights recent advances in remote-access thyroid surgery techniques, including gasless transaxillary, bilateral axillo-breast (BABA), postauricular facelift, and transoral vestibular approaches. Robotic systems, particularly the da Vinci platform, overcome key drawbacks of traditional endoscopy by providing three-dimensional, high- definition views, motion scaling, tremor reduction, and articulated instruments, enabling meticulous dissection in tight operative spaces. Data from over 5,000 cases suggest these methods deliver cancer control comparable to open surgery, with less postoperative pain, higher cosmetic satisfaction, and complication rates below 5% at experienced centers.

AI is progressively enhancing decisions during surgery. Machine learning models trained on extensive annotated surgical videos achieve over 90% accuracy in real-time identification of parathyroid glands and the RLN, helping lower the risk of postoperative hypoparathyroidism, which affects up to 30% of patients following total thyroidectomy. Augmented reality and AI-driven predictive tools aid in recognizing anatomic variations, while data augmentation improves the robustness of these models across various surgical environments.

Nonetheless, challenges persist, such as high costs, a demanding learning curve (typically requiring 40–60 procedures for mastery), and limited accessibility. Future developments may include fully integrated AI-robotic systems, expanded possibilities for remote surgical collaboration, and large prospective trials to validate long-term cancer outcomes. Embracing these technologies promises to make thyroid surgery more precise, widely available, and patient-centered, with fewer complications and better quality of life.

AI Research and Ethics- Balancing Innovation with Responsibility

Dr. Amit Kumar Malviya

Assistant Professor, Department of Anaesthesia, AIIMS Bhopal

Artificial intelligence (AI) is now deeply integrated into biomedical research, influencing data generation, diagnostic modelling, clinical decision support, and scientific writing. As these systems become more autonomous and pervasive, they also introduce complex ethical challenges related to transparency, bias, privacy, accountability, and research integrity. The Indian Council of Medical Research (ICMR) 2024 Ethical Guidelines for AI emphasize that technological progress must align with the core principles of autonomy, safety, equity, validity, and trustworthiness.

This presentation examines how ethical frameworks can safeguard scientific credibility and patient welfare in the era of AI-driven research. Key considerations include responsible use of large datasets, algorithmic bias mitigation, disclosure of AI assistance in manuscripts, and the prevention of fabricated or unverifiable data that may mislead future research or clinical practice. Institutional Ethics Committees (IECs) are urged to incorporate AI-specific review mechanisms, ensure robust oversight, and mandate human accountability at every stage of research.

By embedding ethical governance into the design, validation, and reporting of AI systems, biomedical researchers can strike a balance between innovation and responsibility. Ethical AI is not a barrier but a catalyst for high-quality, trustworthy science that serves society, strengthens public confidence, and positions India as a global leader in safe, equitable, and transparent biomedical innovation.

Decoding The Mycotic Mystry: Emerging Tools in Early Fungal Detection

Dr. Ankesh Gupta

Assistant Professor, Department of Infectious Medicine, SGPGI, Lucknow

Fungal biomarkers such as galactomannan, β-D-glucan, and PCR-based assays have improved early detection of invasive fungal infections, though sensitivity varies by host immunity and pathogen type. Newer technologies, particularly plasma cell-free DNA PCR, offer rapid, non-invasive pathogen identification and the potential for real-time fungal burden assessment. Across heterogeneous cohorts, plasma fungal cell-free DNA PCR consistently enables earlier, non-invasive diagnosis of invasive mold and yeast infections, with sensitivity roughly comparable or superior to galactomannan and culture, particularly for invasive aspergillosis and mucormycosis. Quantitative cycle thresholds and serial kinetics correlate with fungal burden and survival, supporting roles in monitoring and prognostication. Pediatric oncology and transplant series show high concordance with clinical IFD definitions and frequent impact on antifungal decisions. However, specificity can be reduced by colonization or resolving infection, and evidence is largely retrospective, single-center, and focused on molds, limiting firm guideline adoption. In conclusion, fungal cfDNA PCR represents a promising advance that complements traditional biomarkers, providing earlier and more actionable diagnostic information, but requires broader validation before routine integration into clinical guidelines.

Diabetes Prevention and Life time Interventions

Dr. Anupam Parasher

Professor & Head, Community Medicine, AIIMS Raibareli

Diabetes is one of the most prevalent NCDs, with 830 million adults living with diabetes. The prevalence is rising more in low- and middle-income countries, with 81% of adults with diabetes living in low- and middle-income countries in 2022. India reflects this growing challenge; the INDIAB study reported an overall diabetes prevalence of 7.3%, with higher rates in urban (11.2%) than rural (5.2%) populations. Alarmingly, nearly half of all people with diabetes remain undiagnosed, underscoring the need for early detection and preventive action.

There is supporting evidence from landmark trials in China, the United States, Finland, and India that type 2 diabetes is preventable in high-risk individuals. Lifestyle interventions focusing on diet, physical activity, and behavioral counselling have delayed or prevented diabetes by up to 58%. The Indian Diabetes Prevention Programme shows that lifestyle modification and metformin prevent type 2 diabetes in Asian Indian subjects with impaired glucose tolerance.

The **WHO "best buys"** provide a cost-effective framework targeting modifiable risk factors, including tobacco use, harmful alcohol consumption, unhealthy diets, and physical inactivity. The International Diabetes Federation, emphasizes increased intake of fruits and vegetables, avoidance of sugar-sweetened beverages, preference for lean proteins, and substitution of saturated fats with healthier unsaturated fats.

The TRACK strategy—**T**ake prescribed medication, **R**each a healthy weight, **A**dd physical activity**, C**ontrol ABCs (HbA1c, blood pressure, cholesterol), and **K**ick smoking—empowers individuals to reduce risk. There is a need for a paradigm shift toward preventive and promotive care **and life-course approaches** supported by health-enabling environments, which is vital to achieving Universal Health Coverage and curbing the growing diabetes epidemic.

Monocytes subset dynamics in Tuberculosis Resistance

Shaikh Abdul Mubeen[1], Deepak Vats[1], Kapil Yadav[2], Alpana Sharma[1], Archana Singh[1,*]

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Background*: Mycobacterium tuberculosis (M.tb.*) infection can result in active or latent tuberculosis infection (LTBI). Household contacts of TB patients are at high risk of developing LTBI. Still, some individuals exposed to *M.tb* remain negative for tuberculin skin test (TST) and interferon-gamma release assay (IGRA) and are known as 'TB resisters'. Understanding the immune responses in these 'TB resisters' could help identify protective factors against *M.tb*. **Methodology**: This study categorised household contacts as 'LTBI' or 'TB Resisters' based on TST and IGRA test results. Peripheral blood mononuclear cells (PBMCs) from participants were isolated and analyzed to characterize monocyte subsets using CD14 and CD16 markers via flow cytometry. Monocyte intracellular cytokine expression (IL-10, IL-6, TNF-α, and IL-1ß) was also evaluated after stimulation with lipopolysaccharide (LPS). **Results**: The study found that LTBI and active TB patients had higher frequencies of intermediate and non-classical monocyte subsets, indicative of an infectious stage, whereas 'TB resisters' had a higher frequency of classical monocyte subsets. Elevated IL-1ß expression and a higher monocyte-to-lymphocyte (M/L) ratio were observed in PTB, LTBI, and TB resister groups compared to healthy controls, suggesting active disease or exposure to *M.tb*. Classical monocytes (CM) in the 'TB resister group' showed higher IL-1ß and IL10 expression, potentially aiding early infection clearance. LTBI and PTB groups displayed significantly higher TNF-α producing monocytes than healthy controls and 'TB Resisters'. Additionally, LTBI had significantly more IL6-producing monocytes compared to other groups. **Conclusion**: These findings indicate that further longitudinal studies are warranted to understand this unique group of 'TB resisters', and the role of IL-1ß and IL10 secreting classical monocytes in early infection clearance should be explored through in vitro mechanistic studies.

The Clinical Face of Monogenic Diabetes: Patterns and Predictors

Dr. Arun Kumar Pande

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Maturity-onset diabetes of the young (MODY) represents a critical, yet often hidden, subgroup within diabetes care, defined by monogenic defects in beta-cell function. Its accurate clinical identification remains a significant challenge, frequently obscured by misdiagnosis as type 1 or type 2 diabetes. This presentation will delineate the distinct clinical patterns and phenotypic predictors that can unmask MODY in practice. We will explore key diagnostic clues, including autosomal dominant family history, absence of autoimmunity and insulin resistance, preserved C-peptide, and specific features like neonatal hypoglycemia or renal anomalies. The discussion will contrast the stable, mild hyperglycemia of GCK-MODY with the progressive, sulfonylurea-sensitive diabetes characteristic of HNF1A/HNF4A-MODY. A central focus will be on building a pragmatic diagnostic framework—using clinical scoring tools and strategic biochemical testing—to identify high-probability candidates for confirmatory genetic analysis, especially in resource-conscious settings. Furthermore, we will address common pitfalls and predictors of diagnostic delay, including low physician awareness and phenotypic overlap with common diabetes types. By synthesizing clinical patterns with modern genetic insights, this talk aims to equip clinicians with a sharper lens to recognize monogenic diabetes, thereby enabling personalized therapy, rationalizing treatment, and improving long-term patient outcomes through timely diagnosis and family screening.

Role of next generation sequencing in personalised medicine

Dr. Arvind Chaudhry

CEO, Cordon Genomics

Next-generation sequencing (NGS) has emerged as a transformative technology in personalized medicine by enabling comprehensive, high-throughput, and cost-effective analysis of genomic and pathogen-specific information. Through precise identification of genetic variations—including single-nucleotide variants, insertions and deletions, copy number variations, and structural rearrangements—NGS facilitates individualized strategies for disease risk assessment, diagnosis, and treatment optimization. In oncology, NGS-based tumor profiling supports precision oncology by guiding targeted therapy selection, predicting prognosis, monitoring minimal residual disease, and identifying mechanisms of drug resistance.

In the field of infectious diseases, NGS enables rapid and unbiased pathogen identification, detection of antimicrobial resistance determinants, and genomic surveillance of outbreaks, allowing clinicians to tailor antimicrobial therapy and improve infection control strategies. NGS also plays a critical role in reproductive genomics, particularly in non-invasive prenatal testing (NIPT), where analysis of circulating cell-free fetal DNA in maternal plasma allows early and accurate detection of chromosomal aneuploidies and select genetic disorders with minimal risk to the fetus.

Beyond these applications, NGS has expanded the scope of personalized medicine in rare genetic disorders, cardiovascular diseases, and pharmacogenomics by enabling the identification of disease-causing variants and predicting individual responses to drug therapies, thereby reducing adverse drug reactions and improving therapeutic efficacy. Despite existing challenges related to data interpretation, standardization, ethical considerations, and integration into clinical workflows, continuous advancements in sequencing technologies, bioinformatics, and clinical guidelines are enhancing the accessibility and utility of NGS. Overall, next-generation sequencing serves as a cornerstone of personalized medicine, enabling more precise, predictive, preventive, and patient-centered healthcare across diverse clinical disciplines.

An Unconventional Career Path-The Road Less Taken

Dr. Basabdatta Samanta

Safety Physician, IQVIA, Burdhwan

Medical doctors, with both clinical and non-clinical background are increasingly transitioning into Clinical Data Management (CDM) as the clinical research landscape evolves toward more data-driven decision-making. As clinical trials become more complex and globally regulated, the need for accurate, reliable, and clinically contextualized data has never been greater. CDM plays a critical role in ensuring the integrity, consistency, and quality of clinical trial data throughout the drug development pathway—from early-phase trials to post-marketing surveillance.

Medical doctors bring a unique clinical perspective to CDM through their deep understanding of disease mechanisms, therapeutic responses, and physiological variations. This expertise enhances the interpretation of clinical datasets, supports robust medical review of adverse events, and improves the accuracy of data validation and query resolution processes. Their involvement contributes significantly to clinical safety by enabling early detection of safety signals, strengthening adverse event reporting, and fostering collaborative decision-making with pharmacovigilance and clinical operations teams.

Success in CDM demands a combination of clinical knowledge, proficiency in data management tools, analytical thinking, and familiarity with regulatory and Good Clinical Practice (GCP) guidelines. With increasing adoption of electronic data capture systems, medical coding platforms, and automated validation tools, adaptability is the key to success, enabling clinicians to navigate new data systems, regulatory expectations, and emerging methodologies.

Career opportunities for MD professionals in CDM span roles such as Medical Reviewer, Clinical Data Manager, Safety Physician, and Project Manager across CROs, pharmaceutical organizations, and regulatory bodies. As CDM continues to integrate artificial intelligence, real-world evidence, and personalized medicine approaches, the contribution of medical doctors will be central to enhancing data quality and ensuring patient safety in modern drug development.

Droplets don’t lie: The role of ddPCR in precise molecular strike

Dr. Binita Goswami

Director Professor, Incharge Molecular Diagnostic Laboratory, Department of Biochemistry, Maulana Azad Medical College, New Delhi

Droplet Digital PCR (ddPCR) a patented technology, has revolutionised the field of molecular diagnostics. Based on water-emulsion droplet technology, ddPCR fractionates a DNA sample in up to 25,000 droplets. PCR amplification of the template subsequently occurs in each individual droplet, and counting the positive droplets gives precise, absolute target quantification. The partitioning of rare sequences away from the total pool of high-abundance sequences thus facilitates their amplification and subsequent detection, yielding a more accurate estimate of their representation within a sample detection of rare target sequence at an abundance as low as 0.001%, thereby effectively bypassing the adverse signal-to-noise ratio.

In the detection of BCR-ABL transcripts in chronic myeloid leukemia, digital PCR displays a 2–3 log improvement in sensitivity compared with qPCR. Furthermore, the digital PCR assay detects BCR-ABL transcripts in several patients classified as negative by real-time PCR. Human epidermal growth factor receptor 2 (HER2) is overexpressed in about 30% of breast tumors. It has been estimated that ddPCR analyses of tumour samples agrees with conventional pathology assessments using immunohistochemistry (IHC) and fluorescence in situ hybridization (FISH). The ddPCR system can also be used to analyze both activating EGFR mutations and the acquisition of the resistance mutation.

ddPCR can help in non-invasive screening in situations where biopsy is difficult. The increased ability to detect lower mutant:wild-type sequence ratios in circulating tumour DNA has resulted in the greater use of bodily fluids such as plasma, sputum, urine, and stool as sample matrices. ddPCR technology is being used for both the assessment of cancer risk and design of personalized treatment protocols after detection of a tumor.

To conclude, the sensitivity of ddPCR assays can overcome the problem of the high amounts of poor-quality DNA found in FFPE samples. ddPCR technology is a cost-effective method for the screening and monitoring of cancer biomarkers, both before and after treatment.

Curriculum Updates: UG & PG Courses in India

Dr. Dinesh K. Badyal

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Medical courses curricula in India has been updated to competency-based education in alignment with health needs of the country. In 2019, MBBS curriculum was rolled out and this first batch of MBBS has already completed in Internship and are now working. There are major changes in assessment and corresponding updates in teaching learning methods. Early clinical exposure has been added in from phase-I in year 1 and it extends as student doctor method for clinical learning in all phases. Self-directed learning method as dedicated teaching learning methods & AETCOM module has been added. In assessment MCQs are added, there is no theory viva, more emphasis on direct observations e.g. OSCE/OSPE, internal assessment is now part of detailed marks card and university examination is videographed. From 2024 batch, 6 integrated topics are added and one full questions in all phases in all theory apers will be from these integrated topics. In PG courses the curriculum updates are available from 2018 onwards and competency-based changes implemented from admission batch 2022. The major updates are standardisation for teaching methods and assessment methods in all specialities. Nomenclature of theory papers is updated and standardised across subjects. There are postings in other related subjects/areas, internal assessment format is added and many courses are now compulsory like research. Many universities have added blueprint and updated sample papers for UG and PG examinations.

Obstructive Sleep Apnea: Overview and Management

Dr. Hemant Kumar Agarwal

Professor (Jr Grade), Department of Respiratory Medicine, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, Uttar Pradesh

Obstructive Sleep Apnea (OSA) is a common sleep-related breathing disorder characterized by recurrent episodes of upper airway collapse during sleep, leading to intermittent hypoxia, sleep fragmentation, and sympathetic surges. It affects 4–8% of adults globally, with higher prevalence in individuals who are obese, male, elderly, or have craniofacial crowding. Symptoms typically include loud snoring, witnessed apneas, gasping during sleep, unrefreshing sleep, morning headaches, and excessive daytime sleepiness. Untreated OSA is associated with significant cardiovascular and metabolic complications, including systemic hypertension, resistant hypertension, arrhythmias, coronary artery disease, stroke, insulin resistance, and reduced quality of life. Diagnosis is established through polysomnography, which measures apneas and hypopneas to calculate the Apnea–Hypopnea Index (AHI). An AHI ≥5 with symptoms, or ≥15 regardless of symptoms, confirms OSA. Home sleep apnea testing is an option for uncomplicated cases. Management aims to relieve symptoms, improve sleep quality, and prevent long-term complications. Lifestyle modification remains foundational: weight reduction, regular physical activity, avoidance of alcohol and sedatives, and positional therapy in selected patients. Continuous Positive Airway Pressure (CPAP) is the gold standard treatment for moderate to severe OSA. CPAP pneumatically splints the airway, reducing apnea events, improving oxygenation, and lowering cardiovascular risk. Ensuring good mask fit, addressing nasal obstruction, and providing early follow-up enhance adherence.
For patients intolerant of CPAP, alternatives include oral appliance therapy (mandibular advancement devices), which is effective in mild to moderate OSA. Surgical options, such as uvulopalatopharyngoplasty, nasal surgery, maxillomandibular advancement, and bariatric surgery in obese individuals, may be considered based on anatomical evaluation. Hypoglossal nerve stimulation has emerged as a promising therapy for selected patients with moderate to severe disease. With timely diagnosis and appropriate management, most patients experience marked improvement in symptoms, functional status, and overall quality of life, underscoring the importance of increased awareness and early identification of OSA.

Tiny particles, big consequences: Microplastics and reproductive health

Dr. Jayeeta Bhadra

Associate Professor, Department of Biochemistry, Vallabhbhai Patel Chest Institute, New Delhi

Microplastics (MPs), defined as plastic particles <5 mm, are increasingly recognized as all pervasive environmental contaminants capable of entering biological systems and penetrating key barriers of the human body. Their small size, high surface area and capacity to adsorb toxic chemicals enable MPs to induce cellular stress responses, raising concern about their potential impact on male and female fertility.

Experimental evidence consistently demonstrate that MP exposure impairs reproductive function. In males, MPs reduce sperm count, motility and normal morphology and increase DNA fragmentation and oxidative stress. Testicular histology frequently shows degeneration of seminiferous tubules, disrupted spermatogenesis and altered expression of steroidogenic enzymes accompanied by reductions in testosterone.

In females, MPs accumulate in ovarian tissue and impair folliculogenesis, causing reduced follicle numbers, increased atresia, disrupted estrous cycles, and altered levels of reproductive hormones. MPs also impair granulosa cell function and compromise oocyte quality through oxidative and inflammatory pathways.

Importantly, emerging human studies demonstrate the presence of MPs in follicular fluid, with higher MP concentrations associated with poorer fertilization rates. MPs in semen have been found to be significantly associated with sperm abnormalities. These findings, although preliminary, provide direct evidence that MP exposure may influence human reproductive performance.

Overall, current evidence highlights MPs as a significant and emerging threat to reproductive health. Continued research, standardized analytical methods, and human epidemiological studies are needed to better characterize exposure risks and formulates public health interventions.

Acid-Base-ics: Cracking the ABG Code in Critical Care

Dr. Kali Charan Das

Assistant Professor, Incharge Central ICU, AIIMS Raebareli

Background: Maintenance of acid–base balance is essential for physiological stability, optimal enzyme activity, membrane transport, and metabolic homeostasis. Arterial Blood Gas (ABG) analysis is the cornerstone for evaluating acid–base disorders, oxygenation, and ventilation in both critical care and perioperative settings.

Methods: This presentation summarizes principles of acid–base physiology, ABG sampling techniques, interpretation frameworks, and clinical implications. It outlines standard procedures for arterial puncture at common sites, including the radial, brachial, and femoral arteries, and highlights the importance of proper heparin use, avoidance of air contamination, and timely sample analysis. The stepwise diagnostic approach integrates pH, $PaCO_2$, HCO_3^-, anion gap, and delta ratio for accurate identification of primary disorders and secondary compensatory responses.

Results: Acid–base disorders were categorized into metabolic and respiratory acidosis/alkalosis, with acute and chronic compensatory mechanisms described. Buffer systems—bicarbonate, protein, and phosphate—along with respiratory and renal regulation, were detailed. Practical algorithms for diagnosing mixed disorders and evaluating compensatory responses were provided. The anion gap and corrected anion gap methodology help differentiate causes of metabolic acidosis, especially in hypoalbuminemic states.

Clinical Implications: ABG analysis plays a vital role in preoperative assessment, intraoperative monitoring, and postoperative decision-making. It guides ventilation adjustments, fluid and electrolyte therapy, oxygen titration, and recognition of complications such as hypoventilation or metabolic derangements. Chronic CO_2 retainers require careful correction to avoid postoperative alkalemia and neurologic complications.

Conclusion: A systematic understanding of acid–base balance, integrated with accurate ABG interpretation, is essential for safe anesthesia practice and critical care management. Early detection and correction of disturbances improve patient outcomes across perioperative and ICU settings.

Keywords: Acid–base balance, ABG analysis, metabolic acidosis, respiratory acidosis, anion gap, anesthesia implications, buffer systems.

Transforming Clinical Judgement Through Reel Time Surveillance of Preanalytical Influence

Dr. Kamna Singh

Professor & Head, Department of Biochemistry, SNMC, Agra

Background: Preanalytical variables profoundly impact clinical judgement by introducing systematic biases in laboratory results, compromising diagnostic accuracy and patient outcomes. Representing ~66% of total testing errors, these influences occur outside laboratory control, involving modifiable factors (diet, circadian rhythm, smoking) and unmodifiable factors (age, gender, pregnancy). Traditional visual assessment proves unreliable, necessitating real-time surveillance of Hemolysis (H), Icterus (I), and Lipemia (L) indices to transform subjective clinical interpretation into objective, data-driven decision-making per ISO 15189 standards.

Objective: To systematically characterize pre-analytical influencing factors (modifiable/unmodifiable) and interference mechanisms (endogenous/exogenous), establishing standardized protocols and automated HIL detection for improved sample integrity assessment and clinical decision-making.

Methods: Comprehensive analysis of pre-analytical variables through spectrophotometric evaluation at critical wavelengths (H: 415/540/570nm; I: 340-540nm; L: 300-700nm). Automated serum index measurement using LIH reagents on high-throughput analyzers (AU series), generating sample-specific (LIP/ICT/HEM: N to ++++++) and assay-specific (l/i/h) flags. Patient preparation standardization: 7-9am fasting (12hrs), alcohol/smoking avoidance.

Results: Hemolysis identified as primary rejection cause via spectrophotometric/physiological interference (K+, LDH release) and dilution effects. Lipemia induces pseudohyponatremia and 340nm assay disruption; icterus negatively biases H2O2-dependent tests. Flag thresholds established: HEM++ (100-199mg/dL Hb), LIP+ (40-99mg/dL intralipid). Visual assessment deemed unreliable versus automated detection.

Conclusion: Real-time HIL indices enable objective quality assurance, replacing subjective evaluation. Laboratories must verify reagent-specific interference limits and balance result cancellation against clinical urgency. Standardized protocols enhance diagnostic accuracy, ensuring ISO 15189 compliance and patient safety

Keywords: Preanalytical errors, Hemolysis, Lipemia, Icterus, HIL indices.

Increasing obesity in children: A rising concern

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Childhood obesity has emerged as one of the most significant public health challenges of the 21st century. Over the past few decades, the number of overweight and obese children has risen steadily across the globe, cutting across socioeconomic groups and geographical boundaries. This trend is alarming because obesity in childhood is strongly associated with serious health, psychological, and social consequences that can persist into adulthood.

Several factors contribute to this growing problem. Rapid urbanization and changing lifestyles have resulted in reduced physical activity among children. Instead of playing outdoors, many spend long hours on screens—smartphones, televisions, computers, and video games—leading to a sedentary routine. At the same time, easy access to calorie-dense, highly processed foods, sugary beverages, and fast food has replaced balanced, home-cooked meals. Advertising targeted at children further encourages unhealthy food choices. Additionally, lack of awareness among parents regarding healthy nutrition and portion sizes plays a significant role.

The consequences of childhood obesity are far-reaching. Obese children are more likely to develop early-onset type 2 diabetes, high blood pressure, joint problems, and sleep disorders. Beyond physical health, obesity can affect emotional well-being, leading to low self-esteem, social isolation, and bullying. These challenges can have long-term effects on mental health and academic performance.

Addressing this rising concern requires a multifaceted approach. Schools and communities must create environments that promote regular physical activity. Parents should be educated about healthy dietary practices and encouraged to limit screen time while ensuring children get adequate playtime. Policymakers can regulate junk food advertisements and improve access to healthy foods. Healthcare providers should focus on regular screening and early intervention to prevent complications. Addressing this concern requires a comprehensive, multi-level approach. Interventions must focus on promoting healthier eating habits—prioritizing home-cooked meals, fruits, and vegetables—and ensuring children get at least 60 minutes of physical activity daily. Parents, schools, communities, and policymakers must work together to create environments where the healthy choice is the easy choice, safeguarding the future health of our children.

Beyond The ECG: Calcium & Magnesium Mechanistic in Shaping Cardiac Resilience in ICU Patients

Dr. Laraib Sheikh

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Introduction: Electrolyte imbalances are highly prevalent in critically ill patients and play a significant role in determining physiologic stability and clinical outcomes. Among these, calcium and magnesium are central to maintaining cardiovascular, neuromuscular, and immunologic function. Their dysregulation in the intensive care unit (ICU) has been associated with arrhythmias, hemodynamic instability, prolonged mechanical ventilation, and increased morbidity**. Background:** Ionized calcium is essential for myocardial contractility, vascular tone, coagulation pathways, and neurotransmission. Hypocalcemia frequently occurs in conditions such as sepsis, trauma, and major surgery due to disrupted parathyroid hormone responses, cytokine-mediated effects, and citrate exposure during transfusions. Magnesium, a key cofactor in ATP-dependent processes, contributes to membrane stability and immunomodulation; hypomagnesemia is commonplace among ICU patients owing to renal losses, inadequate intake, gastrointestinal disorders, and drug interactions. **Clinical Impact:** Both deficiencies exert measurable clinical consequences. Hypocalcemia is linked to vasoplegia, reduced cardiac output, coagulopathy, and heightened delirium risk, whereas hypomagnesemia predisposes patients to arrhythmias, amplified inflammatory responses, delayed ventilator weaning, and neurocognitive dysfunction. Resilience framework —defined as the capacity to withstand physiologic stress and recover from acute insults—maintaining optimal calcium and magnesium levels supports cardiovascular stability, reduces arrhythmogenic potential, and strengthens immune competence. **Management**: requires individualized monitoring of ionized calcium and serum magnesium, with correction strategies tailored to acid–base balance, renal function, and transfusion exposure. Incorporating electrolyte optimization into broader resilience bundles may further enhance patient recovery. **Future Directions:** It should refine dynamic thresholds, characterize patient-specific responses, and evaluate protocol-based correction strategies to translate biochemical stability into improved ICU outcomes.

Bridging the Gap Between Patients and Physicians: CGMS as a tool for Better Outcomes

Dr. Manish Gutch

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CGMS most commonly refers to **Continuous Glucose Monitoring Systems**, wearable devices that track blood sugar (glucose) levels in real-time for people with diabetes, using a small skin sensor to provide constant data to a phone or receiver, replacing painful finger pricks and helping manage blood sugar trends for better health.

Continuous Glucose Monitoring (CGM)

- **How it Works**: A tiny sensor inserted under the skin (usually arm or belly) measures glucose in the fluid between cells every few minutes; a transmitter sends this data wirelessly.
- **Benefits**: Real-time alerts for high (hyperglycemia) or low (hypoglycemia) levels, trend analysis, better food/exercise/medication decisions, and improved diabetes management.
- **Components**: Sensor (worn for days/weeks), transmitter, and a receiver (smartphone app, insulin pump, or dedicated reader).
- **Impact**: Revolutionized diabetes care, though access and cost remain disparities

Rabies Burden, Challenges and Updates in Animal Bite Management

Dr. Manish Kumar Singh

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Rabies is a 100% fatal viral zoonotic disease caused by the Lyssavirus, transmitted through bites or scratches by infected animals or exposure of saliva to mucosa or broken skin. Globally, rabies causes approximately 59,000 human deaths annually, with Asia accounting for nearly 60% of cases and India contributing about 35% of the global burden. Children under 15 years of age constitute around 40% of bite victims. Surveillance data from the Integrated Disease Surveillance Programme (IDSP) indicate a 45% year-on-year increase in reported dog bite cases. Despite being 100% preventable through timely and appropriate post-exposure prophylaxis (PEP), rabies-related deaths continue to occur due to gaps in management of animal bite. PEP includes immediate wound washing, a complete course of anti-rabies vaccination, and infiltration of rabies immunoglobulin or monoclonal antibodies based on wound severity. Errors in wound categorization, incomplete vaccination, and failure to administer immunoglobulin or monoclonal antibodies are common contributors to preventable fatalities. Recent WHO Strategic Advisory Group of Experts (SAGE) recommendations have simplified PEP regimens; however, effective prophylaxis must still consider factors such as bite site, route of vaccination, prior immunization status, and animal vaccination history. This presentation aims to address existing knowledge gaps and clarify appropriate dog bite management in commonly encountered but poorly understood clinical scenarios.

Principles that Power the Lab: People, Process & Performance

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In the modern laboratory landscape, excellence stems from the dynamic interplay of People, Process, and Performance—three pillars that define both operational strength and scientific credibility. People embody expertise, integrity, and innovation; their continuous training and collaborative mindset transform technical skill into dependable practice. Well-structured processes form the backbone of laboratory reliability—optimizing sample management, workflow design, and quality assurance to ensure precision and reproducibility. When guided by data-driven performance metrics such as turnaround times, accuracy indices, and key performance indicators, these systems enable adaptive improvement and strategic foresight. This lecture highlights how integrative management of manpower, methods, and measurable outcomes not only sustains laboratory efficiency and compliance but also drives a culture of continuous advancement—where every test result reflects excellence through the synergy of people, process, and performance.

Keywords: Laboratory management, Quality assurance, People-Process-Performance, Key performance indicators, Operational excellence

Racing Against Time: Advance Investigations for Detecting Bacterial Sepsis

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Sepsis is a complex process defined as life-threatening organ dysfunction caused by a dysregulated host response to infection. It is associated with morbidity and mortality rates in both adults and children, and early recognition and prompt provision of antimicrobials is imperative.

Both Gram-negative and Gram-positive bacteria play a major role in causing sepsis. These bacteria produce a range of virulence factors that enable them to escape the immune defences and disseminate to remote organs, and toxins that interact with host cells via specific receptors on the cell surface and trigger a dysregulated immune response.

Owing to limitations of current diagnostic tests (i.e., poor sensitivity and delayed results), significant research has been conducted to identify sepsis biomarkers. Ideally, a biomarker can distinguish bacterial infection from other aetiological agents like viruses/fungal or non-infectious causes of systemic inflammatory illness.

One of the most common used sepsis biomarkers is procalcitonin. The Sequential Organ Failure Assessment (SOFA) score is used for the diagnosis of sepsis and involves clinical and laboratory parameters that may not be readily and/or timely available in most resource-poor settings. Procalcitonin concentration has demonstrated positive correlation with SOFA score in bacterial sepsis and can be used as surrogate for sepsis screening/monitoring in resource-poor settings.

The present overview will highlight on bacterial sepsis as well as challenges and limitations of procalcitonin measurement in sepsis. While sepsis has been attributed mainly to host factors, present overview will focus on key role of the invading pathogens and their virulence mechanisms.

Cracking the Allergy Code

Dr. Mayank J Gupta

Director, Kanpur Chest & Allergy Centre, Kanpur

For decades allergies have puzzled scientists and tormented sufferers that why do some people react violently to harmless substances like pollens or peanut while others remain unaffected. An allergy is a exaggerated immune response to a harmless substance, (allergen) like pollen, mite, mould, food, dust or dander which the body considers as a threat triggering an IgE inflammatory response. Scientists now understand that allergies develop through a complex interplay of genetics and environment. Allergy develops by an initial exposure to an allergen called as sSensitization, and after a secondary exposure of same allergen there is an Allergic reaction. To Decode Allergy mandatory requirements include (a) A detailed Clinical history of the patient (b) and Diagnostic tests, both in Vivo and and in Vitro. In Vivo test include (1) Skin Prick tests (2) Bronchial provocation and Nasal provocation test (3) food challenge test. In vitro test include (1) Total serum IgE estimation (2) Allergen specific IgE (Immunocap) and (3) Component Resolve Diagnostic Test: Singleplex or Multiplex.

Toxic trails: linking environment and CKD

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There is substantial and growing epidemiologic and toxicologic evidence that heavy metals (especially cadmium, lead, arsenic, mercury) and certain pesticide exposures are nephrotoxic and associated with reduced kidney function and higher CKD risk, though causal attribution in many situations is complicated by mixed exposures, study design limits, and potential reverse causality.

Mechanisms of injury include: a.) Direct tubular toxicity – heavy metals (Cd, Pb, Hg, As) accumulate in renal proximal tubules causing mitochondrial dysfunction, oxidative stress, apoptosis and chronic tubular injury that reduces GFR over time. b.) Chronic inflammation & fibrosis - repeated low-level exposures induce inflammatory signaling and fibrotic remodeling in the kidney. c.) Indirect pathways- some pesticides and metals contribute to diabetes, hypertension or gut/systemic inflammation that secondarily increases CKD risk.

In this context, the increasing recognition of endemic nephropathies, also known as CKDu (CKD of unknown cause) clusters in hot agricultural communities (Central America, Sri Lanka, parts of India) has been linked to a mixture of factors - heat stress/dehydration, agrochemical (pesticide) exposure, and heavy metals in water/soil, but no single universal cause has been proven. Recent reviews emphasize mixed exposures and the need for longitudinal biomonitoring.

There is now converging evidence from toxicology (animal/cellular), biomonitoring, and population studies supporting nephrotoxicity of several metals and some pesticides. However, many human studies are cross-sectional so reverse causation is possible (CKD can alter excretion and raise blood/urine levels). Mixed exposures (metals + pesticides + heat + infectious/occupational factors) make attribution to a single agent hard. There is also marked heterogeneity across studies, such as different exposure metrics, outcomes (eGFR vs albuminuria vs ESRD), and populations.

The need of the hour is to follow well-designed prospective cohorts with repeated biomonitoring (blood/urine) and good occupational/environmental exposure histories. Studies that analyze mixtures and consider effect modification by heat, hydration, and comorbid conditions, should also be prioritized.

Practical takeaways: With available evidence, it is worthwhile to consider cadmium, lead, arsenic, mercury as kidney risk factors and carefully delineate environmental/occupational exposure history in unexplained CKD. In high-risk communities (agricultural, mining, groundwater contamination), screening + source investigations (water, soil, workplace) and exposure reduction (safe water, PPE, pesticide safety) are prudent public-health steps.

Newer Drugs, Shorter Regime in MDR TB Management

Dr. Nida Khan

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Background: Multidrug-resistant tuberculosis (MDR-TB) continues to pose a major public health challenge, particularly in high burden countries. Conventional MDR-TB treatment regimens were prolonged, toxic, costly and associated with poor adherence and unfavourable outcomes. Under the National Tuberculosis Elimination Programme (NTEP), MDR/RR-TB management has undergone a major shift with the introduction of newer anti-tubercular drugs and shorter, patient friendly regimens.

Method: This presentation presents a concise overview of newer drugs, shorter regimen in MDR-TB management. All DR-TB patients need to be assessed at the time of treatment initiation as per the guidance document for differentiated TB care. All treatment should be delivered under WHO recommended standards adopted by NTEP. Current NTEP guidelines recommend 6 months shorter oral BPaLM/BPaL regimen or 9 months shorter oral MDR/RR-TB regimen. Newer drugs such as bedaquiline, pretomanid, linezolid and moxifloxacin form the backbone of these regimens. Pyridoxine will be administered for the entire duration of treatment as per weight band.

Results: Programmatic data and clinical trials informing NTEP policy demonstrate higher treatment success rates with shorter regimens (~70-90%) along with reduced treatment default, lower incidence of serious adverse drug reactions.

Clinical Implications: Improved patient adherence, reduced pill burden, better tolerability, and enhanced feasibility of implementation in resource-limited settings.

Conclusion: Adoption of newer drugs and shorter regimens under NTEP represents a paradigm shifts in MDR-TB management in India, leading to improved outcomes and supporting progress toward TB elimination goals.

Keywords: Multidrug-resistant tuberculosis, NTEP, Shorter treatment regimen, Bedaquiline,

All-oral therapy

Heavy Metals, Heavier Consequences: Association of Arsenic and Nickel with Metabolic Dysfunction in the Indo-Gangetic plain.

Dr. Nikhil Gupta

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Environmental exposure to toxic metals/metalloids (TM) has been linked to type 2 diabetes mellitus (T2DM) via mechanisms involving insulin resistance and beta cell dysfunction, especially in regions with significant industrial and agricultural activities. We assessed the relationship between serum toxic element levels and glycemic markers, including HbA1c, insulin resistance (HOMA-IR), and beta cell function (HOMA-β%). In total, 783 participants (480 T2DM patients and 303 controls) were recruited. Among the tested TM, Arsenic (72.2%) and Nickel (66.2%) were the most prevalent and associated with T2DM. Ni and As levels were significantly positively correlated with HbA1c and IR, and negatively correlated with β-cell function. Non-filtered water consumption and smoking were associated with higher levels of Ni, As, and IR. The risk of T2DM increased 2.18-fold and 6.81-fold with Ni and As exposure, respectively. The district with the highest exposure (Bahraich) to Ni (82%) and As (88%) had the highest prevalence (82%) of T2DM among the study population. Arsenic and nickel exposure are strongly associated with impaired glycemic markers in T2DM and correspond to drinking water in the Indo-Gangetic Plain. Smoking was also associated with high Ni and As levels.

Immunization to Intervention: A Unified Management Framework for Hepatitis B

Dr. Piyush Upadhyay

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Current Hepatitis B management is guided by evolving, yet divergent, international guidelines that shape the path toward elimination. The 2024 WHO guidelines advocate for expanded adult and adolescent treatment based on fibrosis (APRI >0.5) or viremia >2000 IU/mL with elevated ALT, moving toward a simplified “test and treat” model. In contrast, AASLD (2023) and EASL (2023) guidelines maintain more conservative thresholds for adults, prioritizing those with higher HBV DNA or significant fibrosis, while highlighting the pediatric evidence gap. APASL guidelines similarly focus on high viral load and histological activity but often reflect regional resource realities. Notably, emerging expert consensus increasingly supports a “treat all” strategy to mitigate long-term HCC risk and reduce transmission—a stance progressively mirrored in recent updates but not yet uniformly adopted.

This strategy must be contextualized within persistent systemic gaps: low birth-dose vaccination coverage and high MTCT rates in endemic regions. A unified framework must therefore integrate: 1) harmonized, proactive treatment thresholds across WHO, AASLD, EASL, and APASL recommendations; 2) inclusive, evidence-based pediatric guidelines; 3) equitable implementation to address gender and age disparities in treatment access; and 4) scalable access to novel direct-acting antivirals and immunomodulators. Aligning global guidelines with a prevention-to-treatment continuum is essential to achieve functional cure and elimination targets worldwide.

Code to Cure: AI Transforming the Future of Health

Dr. Pradeep Jingar

CEO, LabWorks Diagnostics and Founder, Clarirynth Healthcare, Jaipur

The session explores how artificial intelligence (AI) can be systematically integrated across the care continuum to address India's dual burden of rising chronic disease and constrained specialist capacity. It begins by demystifying core AI technologies—machine learning, deep learning, natural language processing, and generative AI - and illustrates their current, practical use in clinical decision support, early disease detection, personalized treatment, and workflow automation. Real-world examples highlight gains in diagnostic accuracy, timeliness of sepsis detection, oncology treatment optimization, and reduction of documentation burden.

The talk then examines the Indian context: digital public infrastructure under ABDM, emerging CDSCO Software as a Medical Device (SaMD) guidance, and the critical need for local clinical validation, data quality, and standardization. Ethical anchors such as transparency, human-in-the-loop decision-making, accountability, privacy, and equity are discussed as non-negotiable prerequisites for trustworthy AI in healthcare.

Finally, the session is structured around "action checklists" for key stakeholder groups -clinicians, laboratory professionals, academicians, researchers, healthcare leaders, and policy makers - outlining near-term steps for adoption, upskilling, validation, and implementation. By 2030, the vision is for India to lead in responsible, equitable, AI-driven health systems where clinicians are augmented, not replaced, and "One Health" becomes real through integrated clinical, laboratory, public health, and research data.

Clear Separations, Clearer Detection: Mass Spectrometry in Therapeutic Drug Monitoring (TDM)

Dr. Pratibha Gravel

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Therapeutic Drug Monitoring (TDM) is a critical component of personalized medicine, ensuring that drug concentrations remain within the narrow therapeutic range to maximize efficacy while minimizing toxicity. Traditionally, TDM relied on immunoassays, which, despite their high throughput, often suffer from cross-reactivity with drug metabolites, co-administered drugs, or endogenous substances, leading to inaccurate results. There has been a paradigm shift towards using Mass Spectrometry (MS), particularly coupled with chromatographic separation (LC-MS/MS), as the gold standard for TDM. LC-MS/MS provides high selectivity and sensitivity necessary for the accurate quantification of multiple analytes—parent drugs and their active/inactive metabolites—simultaneously within complex biological matrices (e.g., plasma, serum). Key areas include: The Principle of Superior Selectivity: the combination of Liquid Chromatography (LC) for physical separation, followed by tandem mass spectrometry (MS/MS) for highly specific detection based on mass-to-charge ratios (m/z), effectively overcomes the limitations of immunoassays. This is particularly crucial for drugs with active metabolites. Methodology and Workflow Advantages: the development and validation of high-throughput LC-MS/MS methods, including sample preparation techniques (e.g., protein precipitation, solid-phase extraction) optimized for TDM. The benefits of multiplexing, allow a single assay to quantify several drugs in a "TDM panel". Clinical Applications and Case Studies: Case studies illustrate the clinical impact of LC-MS/MS in TDM for challenging drug classes, emphasizing situations where the superior specificity of MS resolved clinical ambiguity arising from immunoassay interference. Future Directions: Emerging trends, such as the implementation of dried blood spot (DBS) sampling coupled with MS for easier sample collection, and the potential of high-resolution MS (HRMS) for comprehensive drug screening. The aim is to provide Laboratory Physicians with a clear understanding of why the "clear separations" provided by chromatography are indispensable for achieving "clearer detection" via mass spectrometry, ultimately leading to more informed dosing decisions and improved patient outcomes in TDM.

Biochemical signatures in critical illness: From diagnosis to prognosis

Dr. P. V. Sai Saran

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Biochemical markers serve as essential tools in intensive care, guiding clinicians from initial diagnosis through prognostic assessment. These signatures reflect the complex pathophysiology of critical illness, encompassing inflammation, organ dysfunction, and metabolic derangement.

Diagnostic Applications: Upon ICU admission, biomarkers help identify specific conditions. Troponin and natriuretic peptides diagnose cardiac events, while procalcitonin distinguishes bacterial sepsis from other inflammatory states. Lactate elevation signals tissue hypoperfusion, prompting immediate resuscitation efforts. Creatinine and bilirubin levels indicate acute kidney or liver injury, directing organ-specific interventions.

Prognostic Value: Beyond diagnosis, biochemical trends predict outcomes. Persistently elevated lactate correlates with increased mortality in septic shock. C-reactive protein and interleukin-6 trajectories reflect inflammatory burden and treatment response.

Multi-marker approaches enhance prognostic accuracy. Combining traditional markers (lactate, creatinine) with inflammatory mediators improves mortality prediction models. Serial measurements often outperform single values, capturing dynamic physiological changes.

Clinical Integration: Modern critical care increasingly relies on integrated biochemical panels. The prognostic scores in ICU like sequential organ failure assessment score (SOFA) and acute physiology and chronic health evaluation score (APACHE), incorporate multiple biomarkers to quantify illness severity. Point-of-care testing enables rapid decision-making, while machine learning algorithms synthesize complex biochemical patterns to predict deterioration.

Limitations and future directions: Biomarker interpretation requires clinical context, as many lack specificity. Emerging metabolomics and proteomics may identify novel signatures, enabling personalized medicine approaches. Understanding temporal biomarker patterns promises earlier intervention and improved outcomes in critically ill patients.

Mass Spectrometry Meets Exposomics: Mapping the InvisibleEnvironment

Dr. Raghvendra L

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Human health is not only influenced by genome but also by a dynamic and complex mixture of external and internal exposures. Exposomics aims to capture the full spectrum of exposures over a lifetime. Most exposures occur at low levels, and span a vast range of chemicals. It is difficult to track these exposures using traditional targeted assays that focus only on known compounds.

High-resolution mass spectrometry (HRMS), offers unparalleled sensitivity, breadth, and adaptability, which allows scientists to detect thousands of exogenous and endogenous molecules in a single run—including many that were previously unidentified. Longitudinal and "historical" exposomics studies leverage HRMS on archived samples to piece together exposure histories, linking these to molecular changes and clinical results. Integrating exposomics with other 'omics' data and epidemiological insights paves the way for identifying modifiable environmental risk factors and crafting precise environmental health interventions.

The raw mass spectrometry data is enormous and often noisy which is difficult to interpret without right informatics tools. Cheminformatics aid in predicting probable structures, grouping related molecules into families, and deducing sources or pathways of exposure. Recent advances in machine learning and artificial intelligence is radically transforming the field of interpretation of mass spectrometry data and use of exposomics in monitoring health and disease.

Mapping individual exposomes using Mass spectrometry can identify relationship between chemicals and diseases. This approach can also help in revealing "invisible" pollutants in air, water, and soil like per- and polyfluoroalkyl substances (PFAS), which can influence critical regulatory decisions. In conclusion, mass spectrometry is not merely complementing exposomics—it is revolutionizing it with its remarkable clarity and depth bringing us closer to personalized prevention strategies.

Insight into Adipose Transcriptomics & Associated Co-morbidities

Dr. Rakhee Yadav

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Introduction: RNA seq based approaches can be asserted for unravelling complex pathological phenomena especially in relation to multifactorial disorders like obesity and metabolic syndrome. Our study has been planned to analyze obesity associated gene expression patterns in visceral adipose tissue (omental) of obese and non-obese individuals using RNA sequencing to gather an insight into possible therapeutic targets.

Methodology: Omental adipose tissue biopsies were obtained during laparoscopic surgeries in obese (BMI≥30, undergoing bariatric surgeries) and non-obese individuals (BMI≤23, undergoing cholecystectomy or hernia repair). Following their collagenase digestion, adipocyte and stromal vascular fraction (SVF) were separated. A flow cytometric sorting of SVF was done to get pre-adipocytes ($CD45^-$ $CD31^-CD29^+$). From adipose tissue, adipocyte and pre-adipocytes, RNA was isolated, sequenced (25-30 million reads) and analysed using illumina HiSeq platform.

Results: From the total number of expressed genes in each group, those with absolute log2 fold change ≥ 1 and adjusted p-value ≤ 0.05 were considered in our analysis. Interesting revelations were accrued in relation to thrombo-inflammatory pathways, ECM with distinct patterns in cellular metabolism. Careful analysis of top 100 differentially expressed genes and the validation of selected ones on larger subjects revealed novel therapeutic targets particularly related to thrombo-inflammation and ECM-adipocyte interactions like F2RL3-NLRP3 inflammasome axis, Versican-ADAMTS4 interactions. These were further evaluated via in-vitro experiments which gave a proof of our postulation.

Conclusion: RNA seq analysis together with our in-vitro experimental verification have provided valuable insights to pitch in putative candidates which may prove instrumental in relieving thrombo-inflammatory, cardiovascular, and metabolic complications of obesity.

HPV Vaccination: fight against HPV and cancer cervix in India

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- Worldwide there were 660,000 new cervical cancer cases and 350,000 deaths due to cervical cancer in 2022. Over 90% of those cases and deaths occurred in low- and middle-income countries
- In high income countries, cervical cancer screening is an established part of routine health services for women.Where screening rates are low, the HPV vaccine is the best line of defense against cervical cancer.
- In 2022, more than 127,000 new cases of cervical cancer and 79,000 cervical cancer deaths occurred in India. **At least 9 Indian women may die of cervical cancer every hour.** This would add up to almost 80,000 deaths each year.
- There are only two ways to **effectively** prevent cervical cancer.
- Primary prevention: Vaccinating girls in the primary age group of 9-14 years against Human Papillomavirus or HPV, which **works by protecting girls from HPV infection that causes cervical cancer**.
- Secondary prevention: Screening women twice in their lifetime using a high-performance screening test at ages 35 and 45 years.
- Recommending HPV vaccination can drive the country toward eliminating cervical cancer.
- Human papillomavirus or HPV is a small, non-enveloped deoxyribonucleic acid (DNA) virus that infects skin or mucosal cells. Cervical cancer is **by far** the most common HPV cancer in India
- HPV vaccines were first introduced in 2006. Currently, all available HPV vaccines are prophylactic, i.e., to be administered prior to exposure with HPV. HPV vaccines are made from virus-like particles that **CAN NOT** cause infection with HPV or cause cancer.

  HPV vaccination is very safe. HPV vaccine safety is better studied than most vaccines. Data from all sources continue to be fully reassuring regarding the safety profile of HPV vaccines, currently in global use.

Leveraging Large language models in manuscript writing: Using LLMs for literature search, improving writing, ensuring consistency, avoiding plagiarism

Dr. Sandip Mukhopadhyay

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Scientific writing is both an essential skill and a persistent challenge for researchers, especially early-career investigators who struggle with clarity, structure, and the ever-growing volume of scientific literature. Large Language Models (LLMs) and contemporary AI-assisted writing tools have emerged as transformative supports in this landscape. Large Language Models (LLMs) represent a major advancement in artificial intelligence. These models—such as ChatGPT, Google Gemini, Anthropic Claude, and Meta Llama—are trained on massive datasets containing text, scientific literature, and diverse natural language patterns. As a result, they can understand queries, generate human-like text, summarize information, refine language, and support various writing and analytical tasks. Their expanding capabilities have opened new opportunities for researchers to enhance the quality and efficiency of scientific writing. These tools can be thoughtfully and ethically integrated into the manuscript-writing workflow to enhance productivity without compromising scientific integrity.

LLMs can streamline literature search by rapidly summarizing articles, identifying thematic patterns, and highlighting knowledge gaps. Their language-enhancement features help improve grammar, academic tone, structure, and overall coherence of manuscripts. Examples demonstrate how LLMs assist with abstract improvement, harmonization of terminology across sections, creation of manuscript frameworks, and identification of inconsistencies between introduction, results, and discussion. LLM-based tools (such as Elicit, Scite, and Perplexity) support reference discovery, citation formatting, and verification of scientific claims. Traditional literature review methods often demand extensive time and meticulous reading; however, LLMs can accelerate this process by generating preliminary summaries, outlining key themes, and helping users navigate emerging evidence. Their ability to refine academic language—improving tone, coherence, grammar, and flow—makes them especially useful for those seeking to enhance clarity in scholarly communication.

Beyond language enhancement, LLMs can assist researchers in maintaining style consistency, harmonizing terminology, and preventing inadvertent repetition across manuscript sections. Demonstrations highlight real-world scenarios such as improving abstract quality, aligning introduction and conclusion narratives, and ensuring uniformity in technical terms.

Because LLMs generate text based on learned patterns—not true comprehension—there are associated risks, including hallucinations, outdated references, factual errors, and unintentional plagiarism. It is important to use the LLM in a safe and responsible way, including verification of the AI-generated content and critically review outputs for accuracy and context.

Importantly, the presentation reinforces ethical boundaries: LLMs cannot be listed as authors, and any substantial use of AI must be transparently disclosed in accordance with ICMJE and COPE recommendations. While AI tools can meaningfully support researchers—from structuring ideas to refining language—they cannot replace scientific judgement, domain expertise, or methodological rigor.

In summary, when used responsibly, LLMs offer a powerful, accessible means to simplify, accelerate, and elevate manuscript writing. They empower researchers to focus on what truly matters: generating high-quality science and communicating it with clarity and impact.

*** LLM has been used to prepare this abstract partly (to provide an example).*

Groundbreaking Innovation in Renal Transplant Technologies

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The current standard of care for the patients with end stage renal disease (ESRD) is a kidney transplant or dialysis when a donor organ is not available. The growing gap between patients who require a kidney transplant and the availability of donor organs as well as the negative effects of long term dialysis, such as infection, limited mobility and risk of cancer development, drive the impetus to develop alternative renal replacement technology. The goal of this presentation is to assess the potential of the two of the most recent innovations in kidney transplant technology –the implantable bio-artificial kidney (BAK) and kidney regeneration technology in addressing the aforementioned problems related to kidney replacement for patients with ESRD. Both innovations are fully implantable, autologous, personalized with patient cells, and can replace all aspects of kidney function. Not only do these new innovations have the potential to improve the possibility of transplantation for more patients, they also have potential to improve the outcome of transplantation or dialysis-related renal cancer diagnosis. A major limitation of the current technology is that both implantable BAK and kidney regeneration technology are still in preclinical stages, and thus their potential effects cannot be comprehensively generalized to human patients.

Breathing at Night: Pathophysiology and Detection

Dr. Sankalp Jha

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This presentation explores the mechanisms underlying common disorders such as Obstructive Sleep Apnea (OSA), Central Sleep Apnea (CSA), Nocturnal Asthma, and Sleep-Related Hypoventilation. Pathophysiologically, OSA involves upper airway collapse due to muscle relaxation and anatomical factors, resulting in hypoxia, hypercapnia, and fragmented sleep. CSA stems from neurological disruptions in respiratory drive, while Nocturnal Asthma is exacerbated by circadian rhythms that increase airway inflammation. The resulting pathophysiological cascades lead to systemic impacts, including cardiovascular strain (e.g., hypertension, arrhythmias), neurological deficits (e.g., cognitive impairment), and metabolic disturbances (e.g., insulin resistance).

In athletes, untreated moderate-to-severe sleep-disordered breathing can meaningfully impair cardiorespiratory function and recovery. Evidence indicates it can contribute to reductions in VO_2max and performance efficiency, heighten perceived fatigue, and elevate injury risk by hindering muscle repair, glycogen restoration, and neurocognitive function.

Detection methods range from the gold-standard Polysomnography (PSG) and Home Sleep Apnea Testing (HSAT) to validated questionnaires (e.g., STOP-BANG) and emerging wearable technology monitoring nocturnal heart rate variability and SpO_2. For the athletic population, integrating these tools into pre-participation screenings and longitudinal monitoring is key to assessing training load tolerance and recovery status.

Management strategies encompass standard therapies (e.g., CPAP, inhalers) alongside sports-specific interventions such as inspiratory muscle training, positional therapy, and techniques to optimize airway tone. Future directions point to personalized, real-time monitoring via advanced wearables.

Markers of Motherhood: Windows to Two Lives

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Pregnancy represents a unique physiological state in which two interdependent lives, the mother and the fetus, are intricately connected through complex hormonal, metabolic, and immunological pathways. Monitoring specific biomarkers during gestation provides valuable clinical insight into maternal adaptation and fetal development.

This presentation focuses on key maternal-fetal biomarkers that serve as diagnostic and prognostic indicators of health and disease during pregnancy. Discussion encompasses hormonal, metabolic, immune, and placental markers, emphasizing their roles in routine antenatal screening, fetal well-being assessment, and prediction of pregnancy complications. Hormonal markers such as hCG, progesterone, estriol, and hPL reflect placental function and fetal health; metabolic markers, including OGTT, HbA1c, lipid profile, and micronutrients, aid in early detection of gestational diabetes and nutritional deficiencies; while inflammatory and immune markers like CRP, cytokines, and autoantibodies help distinguish normal physiological adaptation from pathological states. Additionally, placental and fetal markers such as AFP, PAPP-A, inhibin-A, and cfDNA play a crucial role in prenatal screening for chromosomal and structural anomalies. Predictive markers, including the sFlt-1/PlGF ratio, fetal fibronectin, and IGF-1, enhance early identification of preeclampsia, preterm labor, and fetal growth restriction. Integration of biomarker assessment into antenatal care facilitates early diagnosis, precise risk stratification, and personalized maternal-fetal management.

In conclusion, maternal-fetal biomarkers truly serve as *"windows to two lives"*, reflecting the delicate physiological harmony between mother and child, and bridging clinical laboratory science with precision maternal medicine.

Keywords: Maternal-fetal biomarkers, Prenatal screening, PAPP-A, sFlt-1, PlGF, Preeclampsia

Decoding the Fetal Genome—Advances in Prenatal Screening

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The rapid evolution of genomic technologies is reshaping prenatal screening, enabling unprecedented insights into the fetal genome. Traditional approaches—ultrasound markers, biochemical screening, and karyotype—have progressively expanded to include chromosomal microarray and non-invasive prenatal testing (NIPT). Today, advances in high-resolution sequencing, including genome-wide NIPT, rapid exome sequencing (rWES), and whole-genome sequencing (WGS), allow detection of aneuploidies, pathogenic copy-number variants, and monogenic disorders even when routine investigations are normal. In pregnancies with structural anomalies, prenatal exome sequencing yields diagnoses in 10–40%, significantly influencing prognosis, perinatal management, and recurrence counselling. Emerging tools such as cfRNA profiling, methylation signatures, and organ-specific biomarkers promise further refinement of fetal phenotyping. However, challenges remain, including biological limitations of cell-free DNA, confined placental mosaicism, interpretative difficulties with variants of uncertain significance, and ethical considerations surrounding incidental findings and adult-onset conditions. The future of prenatal genomics will integrate genetic data, AI-enhanced imaging, and population-specific reference datasets to build predictive, ethically responsible screening models. Decoding the fetal genome offers transformative potential for precision prenatal care, but demands careful interpretation and balanced counselling to ensure that families receive meaningful, actionable information.

From Crisis to Control: Evolving Frontiers in Pheochromocytoma Management

Dr. Sunil Singh

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Pheochromocytoma and paraganglioma (PPGL) represent rare neuroendocrine tumors characterized by catecholamine hypersecretion, posing significant diagnostic and therapeutic challenges. Historically, these tumors epitomized medical crises, with undiagnosed cases leading to catastrophic intraoperative hypertensive storms and mortality rates exceeding 45% before the advent of alpha-blockade in the mid-20th century. Earlier in 90s in india management relied on symptomatic control and open surgical resection, often complicated by incomplete preoperative preparation and limited imaging modalities.

Transitioning to contemporary control, multidisciplinary approaches have revolutionized outcomes. Biochemical confirmation via plasma metanephrines (sensitivity >95%) precedes advanced imaging like CT/MRI or Ga-68 DOTATATE PET for localization and metastasis detection. Genetic testing, now standard per 2022 Endocrine Society guidelines (reaffirmed 2025), identifies hereditary syndromes in up to 40% of cases, enabling risk-stratified surveillance. Preoperative optimization with alpha- and beta-blockers minimizes perioperative risks, while laparoscopic adrenalectomy achieves cure in >90% of benign cases, reducing complications to <5%.

Evolving frontiers emphasize precision medicine. The 2025 FDA approval of belzutifan a HIF-2α inhibitor, marks a breakthrough for advanced/metastatic PPGL, demonstrating durable responses in ~30% of patients from the LITESPARK-015 trial, with manageable anemia as a primary side effect. Temozolomide enhances options for SDHB-mutated metastatic disease, achieving response rates up to 40%. Emerging therapies, including tyrosine kinase inhibitors and biofabricated tumor models, promise personalized interventions. Long-term follow-up integrates molecular profiling to mitigate recurrence risks (10-15%).

This evolution from crisis to control emphasizes the power of integrated care, genetics, and targeted therapies, offering hope for improved survival and quality of life in PPGL management.

From Smog to Systemic Disease: Health Effects of Air Pollution in India

Dr. Surya Kant

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Nowadays air pollution is one of the most critical public health challenges confronting India, accounting for a substantial burden of disease, premature mortality, and significant economic loss. Air pollution is responsible for many health hazards leading to death of about 20 lacs people in India.

While air pollution has traditionally been known as a predominantly respiratory hazard, scientific evidence now definitively recognizes it as a powerful multisystem toxicant with far-reaching effects beyond the lungs. My talk will examine the evolving paradigm that positions air pollution not merely as a localized pulmonary insult but as a critical driver of systemic disease.

My lecture will focus on the major ambient and household air pollutants prevalent across India, including particulate matter ($PM_{2.5}$ and PM_{10}), nitrogen oxides, sulfur dioxide, ozone, and biomass fuel emissions. It will then elucidate the underlying pathophysiological mechanisms through which these pollutants exert systemic effects, with particular emphasis on oxidative stress, chronic low-grade inflammation, endothelial dysfunction, epigenetic alterations, and immune dysregulation. These shared biological pathways link air pollution exposure to a wide spectrum of non-communicable diseases, including ischemic heart disease, stroke, diabetes mellitus, chronic kidney disease, adverse pregnancy outcomes, and neurocognitive disorders.

Moreover, drawing upon epidemiological evidence, clinical experience, and published research, the keynote will highlight populations that are disproportionately vulnerable to pollution-related health effects, such as children, older adults, pregnant women, and individuals with pre-existing cardiopulmonary conditions. The compounded risks associated with urban smog, indoor biomass fuel use, and occupational exposures in low- and middle-income settings will be critically discussed.

Finally, the address will focus on prevention, policy implications, and the primal role of clinicians and public health professionals in early recognition, patient counselling, advocacy, and mitigation strategies. Recognizing air pollution as a determinant of systemic disease is essential for developing integrated clinical, environmental, and policy responses to protect population health in India.

Keywords: Air Pollution India, Non-Communicable Diseases (NCDs), Respiratory Health, Environmental Exposure, Public Health, Particulate Matter

Exposomics: The Unexplored Toxins

Dr. Swarup A. V. Shah

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Exposomics, the comprehensive study of the totality of environmental exposures and their biological effects, has rapidly emerged as a pivotal framework in advancing exposome research and understanding the complex determinants of human health. By characterizing exposures from conception across the lifespan, exposomics provides a holistic lens through which the interplay between environmental factors and disease risk can be understood. As the global burden of chronic diseases continues to rise, there is a growing need to move beyond traditional approaches that examine single exposures in isolation and instead adopt strategies capable of capturing cumulative, interacting, and time-varying environmental influences.

Recent progress in high-resolution mass spectrometry and high-throughput omics platforms—including genomics, epigenomics, proteomics, and metabolomics—is revolutionizing the field. These technologies allow simultaneous quantification of diverse chemical exposures, internal biomarkers, and molecular response pathways, producing rich datasets that enable integrative multi-omics analyses. Such approaches are uncovering previously unrecognized exposure–disease relationships and providing mechanistic insights into how environmental factors perturb biological systems.

By aligning exposomics with precision medicine principles, researchers are now developing individualized exposure profiles that can refine risk prediction, guide targeted prevention, and support tailored interventions. Ultimately, the continued evolution of exposomics-driven, integrative multi-omics frameworks is poised to significantly enhance our ability to predict, prevent, and mitigate the health impacts of environmental exposures, thereby improving long-term public health outcomes.

When medicine turns foe: Unravelling Drug Allergy

Dr. Taha

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In the realm of healthcare, drug allergy is a significant yet often-overlooked issue that warrants attention. While medications are intended to heal, they can sometimes trigger adverse reactions, turning the cure into a problem. This phenomenon is more common than we think, affecting countless individuals worldwide, yet it remains an uncomfortable and underdiscussed topic, particularly in our region.

In this comprehensive overview, we will navigate the complexities of drug allergy, its far-reaching consequences on patient care, and the pivotal role of accurate labelling. We will explore the critical processes of delabeling, where we rectify false or inaccurate labels, and labelling, where we identify true allergies, empowering patients with safe and effective treatment options.

Through real-time cases, we will highlight the challenges posed by inaccurate labels and discuss strategies for enhancing diagnosis, treatment, and patient outcomes. We will also examine approaches for managing patients with suspected allergies, including diagnostic testing and desensitization protocols, ensuring the safe use of essential medications.

By illuminating this critical issue, we aim to spark discussion, foster awareness, and promote a more scientific approach to addressing drug allergy, ultimately improving patient care and outcomes.

HbA1c Estimation in Non-Dialysis CKD Patients: Comparative Evaluation of TINIA and HPLC Methods

Dr. Vibhav Nigam

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Chronic kidney disease (CKD) is a significant health concern, impacting approximately 27% of the population, with a heightened occurrence among individuals with diabetes. Glycosylated hemoglobin (HbA1c) serves as a crucial biomarker for managing diabetes mellitus (DM), as it reflects long-term glucose control. Accurate HbA1c measurements are vital for reducing vascular complications by maintaining glycemic control. However, accurate assessment of HbA1c in chronic kidney disease (CKD) is challenging due to frequent anemia, iron deficiency, and elevated carbamylated hemoglobin (CHb).

Various laboratory techniques can be employed to determine HbA1c levels in the blood. While HPLC is preferred method worldwide, alternative methods such as the immunoturbidimetry are gaining attention for their cost effectiveness and operational simplicity, making them a promising solution for resource-limited settings as it does not require a separate instrument in contrast to HPLC. Studies have consistently shown notable discrepancies between these analytical methods. Biological variation sets the permissible total error for HbA1c at 3.0%, while NGSP standards allow up to 6.0%.

This study compared the efficacy of the immunoturbidimetric inhibition immunoassay (TINIA) with that of high-pressure liquid chromatography (HPLC) in the analysis of HbA1c.

ICG for Tumor Mapping

Dr. Vikas Sharma

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Background: Indocyanine Green (ICG), originally introduced in the 1950s for liver-function assessment, has now emerged as a transformative tool in modern oncological surgery.

Properties & Mechanism: ICG is a water-soluble synthetic dye that fluoresces under near-infrared (NIR) light (700–800 nm), enabling deep tissue penetration with minimal background interference. Once administered intravenously, ICG binds to plasma proteins and is rapidly cleared by the liver (half-life ~2–5 minutes), making it ideal for real-time intraoperative imaging.

Applications: The use of ICG in cancer surgery spans multiple domains:

- **Tumor margin assessment** — allowing surgeons to delineate tumor boundaries more precisely, reducing the likelihood of residual malignant tissue and lowering re-excision rates.
- **Sentinel lymph node (SLN) mapping** — providing a non-radioactive, fluorescence-guided alternative for SLN detection in breast cancer, melanoma, gynecologic and other malignancies, improving detection rates while minimizing morbidity associated with extensive lymphadenectomy.
- **Minimally invasive and robotic surgeries (GI, HPB, colorectal, esophageal, etc.)** — enhancing visualization of vascular and lymphatic structures, thereby aiding safe resection with better preservation of healthy tissues.
- **Perfusion assessment & reconstructive surgery** — allowing intraoperative evaluation of bowel or flap vascularization to ensure sufficient blood flow, reducing risks of postoperative ischemia or anastomotic leaks.

Advantages: ICG fluorescence-guided surgery supports real-time decision making, increases surgical precision, reduces tissue trauma, lowers morbidity, and is readily adaptable to minimally invasive platforms, offering improved functional and aesthetic patient outcomes.

Future Directions: Emerging research aims at developing tumor-targeted ICG conjugates to improve specificity, integrating ICG fluorescence with advanced intraoperative imaging (e.g., hybrid systems, AI-based analysis), and conducting more robust clinical trials to establish standardized protocols and expand applications across cancer types.

Conclusion: ICG-guided fluorescence imaging represents a paradigm shift in surgical oncology. By providing surgeons with a "real-time second pair of eyes," ICG enhances the precision of tumor resections, lymph node mapping, and perfusion assessment — ultimately improving oncological and functional outcomes for patients. Continued technological innovations and standardization efforts are likely to further cement its role in the future of cancer surgery.

Autoantibody Signature in Systemic Autoimmunity

Dr. Yashwant Kumar

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Autoantibodies are central biomarkers in systemic autoimmune diseases, providing diagnostic, prognostic, and stratification value across a broad spectrum of conditions. Autoantibody signatures defined by the presence, patterns, and combinations of autoantibodies support the differentiation of diseases such as systemic lupus erythematosus, Sjögren's syndrome, systemic sclerosis, myositis, rheumatoid arthritis, and ANCA-associated vasculitis. These signatures also have organ-specific relevance, including autoimmune liver disease and endocrine autoimmunity. Indirect immunofluorescence on HEp-2 cells remains the first-line screening method due to its high sensitivity and ability to reveal pattern-based diagnostic clues, as illustrated by nuclear, cytoplasmic, and mitotic patterns across AC designations. Solid-phase assays, including ELISA, fluoroenzyme immunoassays, line immunoassays, and multiplex bead-based platforms, provide complementary specificity, automation, standardisation, and expanded antigen coverage. Reflex algorithms incorporating second-line testing, such as ENA panels, myositis panel blot, and Luminex-based multiplex profiling, improve diagnostic confidence, particularly in overlap syndromes and for refining phenotypes. Local laboratory trend analysis demonstrates increasing autoimmune testing demand and evolving disease patterns, emphasising the need for optimised workflows and evidence-based test utilisation. The integration of screening and confirmatory methods enhances accuracy and supports precision immunology. In conclusion, autoantibody signatures, when interpreted in the context of clinical presentation and assay methodology, are powerful tools guiding diagnosis, risk assessment, and management in systemic autoimmunity.

ABSTRACTS
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ORFA_01

Assessment of Pulmonary functions in previously treated drug sensitive Pulmonary Tuberculosis patients

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Introduction: Although pulmonary tuberculosis (PTB) is curable with appropriate anti-tubercular therapy, many patients experience persistent respiratory impairment post-treatment, now recognized as post-TB lung disease (PTLD). PTLD includes a wide spectrum of structural and functional lung abnormalities, contributing to morbidity and reduced quality of life. Despite its burden, PTLD remains under-recognized in current TB control programs. The current study was aimed to assess pulmonary functions in previously treated drug sensitive PTB patients.

Material and Methods: A cross-sectional, observational hospital-based study focusing on patients who had completed treatment for drug-sensitive pulmonary tuberculosis at the Department of Respiratory Medicine, SHKM GMC, Nalhar was conducted. Pulmonary function was assessed using spirometry and the 6-minute walk test (6MWT). Lung function patterns were analyzed to determine the predominant impairment. Correlations were evaluated between forced vital capacity (FVC) and 6-minute walk distance (6MWD), and between modified Medical Research Council (mMRC) dyspnea grading and spirometric parameters including FVC and forced expiratory volume in the first second (FEV1).

Results: Significant proportion of treated PTB patients exhibited impaired lung function, as evidenced by spirometry and the 6MWT. The study included 90 previously treated PTB patients with a mean age of 42.9 ± 11.4 years. Shortness of breath was the most common symptom (67.8%), followed by cough (33.3%). Spirometry revealed abnormal lung function in 70% of patients: 22.2% had restrictive, 21.1% obstructive, and 26.7% mixed patterns. The mean 6-minute walk distance (6MWD) was 406 ± 129.9 meters. A significant positive correlation was found between FVC and 6MWD ($r = 0.658$, $p = 0.001$). FVC showed a statistically significant decline with increasing mMRC dyspnoea grade ($F = 6.65$, $p = 0.001$).

Conclusion: This study highlights that despite successful treatment, pulmonary tuberculosis often results in persistent lung function impairment and reduced exercise capacity, underscoring the chronic burden of post-TB sequelae and the need for regular monitoring and pulmonary rehabilitation**.**

Keywords: Post-TB lung disease (PTLD), pulmonary tuberculosis, spirometry, 6-minute walk test, lung function impairment, mMRC, FVC, FEV1.

ORFA_02

Adherence, compliance and perceptions of women using ANTARA, in primary health care settings of Ayodhya: a mixed-method study

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Background: The Government of India has worked to expand access to injectable contraceptives through the introduction of a three-monthly injectable contraceptive DMPA under the 'Antara' program in 2017; is considered a highly effective, long-acting reversible contraceptive, but its compliance is poor & discontinuation rates are high.

Aim: Adherence, compliance and perceptions of Women using Antra, in primary health care settings of Ayodhya.

Methods: A mixed-method study was conducted in the family planning unit of Community Health Centre, Masaudha block, Ayodhya among 200 women and the data was collected about sociodemographic details, perceptions about Antara injection and its practice among Antara users. This was followed by a focused group discussion with few service providers.

Result: Most women were homemakers, and 75.53% had two or more children. A large proportion (74.46%) had not previously used any family planning method and for most of women, health personnel served as the primary source of information regarding DMPA. On thematic analysis it was observed that most women reported choosing DMPA because it is easy to use, and provides long-term contraception. However, a considerable proportion discontinued its use due to side effects. Service providers cited inadequate follow-up counselling and lack of community awareness as reasons for discontinuation.

Conclusion: To correct misconceptions and promote awareness regarding the benefits of injectable contraceptives, comprehensive health education and behaviour change interventions are essential. Such measures are necessary to improve compliance with Antara and to ensure the effective implementation of contraceptive programs.

Keywords: Antra, mixed-method study, Adherence, discontinuation rates, Side effects

ORFA_04

Nuclear Magnetic Resonance based identification of metabolites in Dermatophytes

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Identifying fungi and their susceptibility to treatments is slow due to their slow growth. Metabolomics, particularly using Nuclear Magnetic Resonance (NMR) spectroscopy, offers a faster, non-invasive approach to distinguish closely related fungal species by analysing metabolites from cell extracts or growth media. Proton NMR has proven to measure metabolic end points (MEP) much earlier than traditional Minimal Inhibitory Concentration (MIC) methods, providing a high- throughput option for identifying and studying dermatophytes. This technique remains underexplored in dermatophytic infections but holds significant promise for rapid and automated fungal analysis. We have used 1D and 2D Nuclear Magnetic Resonance (NMR) experiments for identification of primary metabolites in the methanol extract of two fungal species- Trichophyton mentagrophyte and Trichophyton rubrum. Both standard strains and representative number of clinical isolates of these two species were investigated. We have identified twenty-three metabolites in the Trichophyton mentagrophyte and another twenty-three metabolites in Trichophyton rubrum. Many important metabolites like trehalose, proline, mannitol, acetate, GABA, and several other amino acids were detected which provide the necessary components for fungal growth and metabolism. This was a first attempt in developing a metabolic profiling based fast diagnostic method for detection of the dermatophyte species using affected samples, e.g., skin, nail, etc or initial culture profiling.

ORFA_05

Signal Transduction Pathways in Endometrioid Endometrial Carcinoma and Precursor Lesions

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Introduction: Endometrial cancer is the sixth most common malignancy among women worldwide, with endometrioid endometrial carcinoma (EEC) representing the predominant subtype arising from precursor hyperplastic lesions. Epithelial–mesenchymal transition (EMT) plays a central role in its progression, driven by dysregulation of PI3K/AKT/mTOR, Ras/MAPK and WNT/β-catenin pathways and epigenetic silencing of tumor suppressor genes.

Materials and Methods: This retrospective and prospective nested case–control study, conducted at tertiary care teaching hospital in Northern India, analyzed 95 endometrial biopsies classified as normal proliferative endometrium (n=19), precancerous lesions as endometrial hyperplasia (n=37) and EEC (n=39). Histopathological, immunohistochemical and methylation analyses were performed to evaluate pathway activation and EMT-related molecular alterations.

Results: Most EEC patients were postmenopausal and overweight/obese. In precancerous lesions, PTEN expression correlated positively with E-cadherin and inversely with N-cadherin, and pAKT, pMTOR and p70S6K showed significant associations with E-cadherin repressors SLUG and SIP1. In carcinomas, pMTOR correlated inversely with E-cadherin and positively with N-cadherin, and p70S6K correlated with E-cadherin repressor SNAIL. Cross-pathway interactions were observed, including significant associations between pMTOR and β-catenin. Overall, findings demonstrate progressive EMT induction through activation of PI3K/AKT/mTOR and WNT/β-catenin pathway.

Conclusion: Alterations in PI3K/AKT/mTOR, ERK–MAPK and Wnt/β-catenin signaling pathways, along with hypermethylation of key tumor suppressor genes, play a significant role in early endometrial carcinogenesis. Their strong association with EMT markers indicates that pathway–EMT crosstalk begins early and may drive initial tumor progression. These findings highlight potential molecular targets for early intervention and warrant validation in larger cohorts.

ORFA_06

Comparison of the safety and efficacy of ultrasound-guided shoulder block versus interscalene block for shoulder surgery: A systematic review and meta-analysis of randomized controlled trials

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Background and Aim:

Adequate perioperative analgesia improves outcomes and enables early rehabilitation in shoulder surgeries. Both interscalene block (ISB) and shoulder block (SB; a combination of suprascapular and axillary nerve blocks) are commonly used regional anesthesia techniques. This systematic review aimed to compare the safety and efficacy of ultrasound-guided SB versus ISB for patients undergoing shoulder surgeries.

Material and Methods: A systematic literature search was conducted on electronic databases up to 31st December 2024 in PubMed, Embase, Google Scholar, Web of Science, and Cochrane Central Register of Controlled Trials. All randomised controlled trials in the English language that compared ultrasound-guided SB and ISB for shoulder surgery under general anesthesia were included. The primary outcome was postoperative opioid consumption (24-hour morphine equivalents). Pain scores, patient satisfaction scores and time to first analgesic effect were used as secondary outcome measures to assess the efficacy of blocks. Safety outcomes included postoperative nausea/vomiting, dyspnoea, persistent paraesthesia or weakness, hoarseness in voice, and Horner's syndrome. Data were analyzed using a random-effects model and presented as forest plots.

Results: Eight RCTs involving 519 patients (SB = 257, ISB = 262) were included in the meta-analysis. Four studies (n = 258) reported 24-hour postoperative opioid consumption, with no significant difference between groups (SMD -0.10; 95% CI -0.34 to 0.15; $I^2 = 0\%$; p = 0.43). ISB was associated with lower pain scores in the post-anesthesia care unit (7 studies, n = 489; SMD 1.26; 95% CI 0.26 to 2.26; p = 0.01) and at 4 hours postoperatively (6 studies, n = 430; SMD 1.62; 95% CI 0.13 to 3.11; p = 0.03). At 24 hours, SB resulted in significantly lower pain scores compared to ISB (8 studies, n = 519; SMD -0.88; 95% CI -1.58 to -0.19; p = 0.01). Dyspnea (5 studies, n = 350), Horner's syndrome (3 studies, n = 182) and motor weakness (5 studies, n = 311) were significantly more frequent in the ISB group (RR 0.19, 0.11, and 0.12 respectively; p < 0.01 for all)

Conclusion: Both ultrasound-guided ISB and SB provide effective postoperative analgesia following shoulder surgery. Considering a significantly higher incidence of dyspnoea and Horner's syndrome with ISB, SB may be a safer alternative, especially in patients with compromised respiratory function.

KEYWORDS: Shoulder; Analgesia; Ultrasonography, Interventional; Brachial Plexus Block; Pain, Postoperative

ORFA_07

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Objective: The aim of the study is to identify whether crossing vessel is a cause or an associated finding in Pelvi Ureteric Junction Obstruction.

Material and methods: This is a prospective study of a total of 128 patients who underwent laparoscopic pyeloplasty from January 2016 to June 2020. All patients who underwent laparoscopic pyeloplasty and pelvi ureteric junction segments were sent for histopathological examination. The presence of crossing vessels is documented intraoperative and patients were divided into two groups, group 1 having pelvi ureteric junction obstruction with crossing vessel, and group 2, pelvi ureteric junction obstruction without crossing vessels. Histopathological examination findings of pelvi ureteric junction segment including inflammation, fibrosis, muscle hypertrophy, muscle disarray, and synaptophysin were recorded. Unpaired Student t-test was used for comparing differences between continuous normally distributed data from 2 samples and non-parametric tests were applied for continuous data.

Results: Of the total 128 patients, crossing vessels were identified in 42 (32.8%), and 86 (67.2%) were without crossing vessels. The demographic profile of patients between the 2 groups was comparable. On histopathological examination, moderate-to-severe chronic inflammation was seen in 23.8% and 44.2% ($P > .05$) in group 1 and group 2, respectively; fibrosis and muscular hypertrophy were higher in group 2 but statistically insignificant ($P > .05$), and muscle disarray was higher in group 1 but statistically insignificant ($P > .05$). Synaptophysin was positive in 4.8% and 4.7% in group 1 and group 2, respectively.

Conclusion: The differences in histopathological examination between the 2 groups were not statistically significant. However, in patients with crossing vessels, there was a higher degree of inflammation, which may lead to early pelvi ureteric junction obstruction.

Keywords: Pelvi ureteric junction obstruction, histopathology, laparoscopic pyeloplasty, crossing vessel

ORFA_08

Mitochondrial dysfunction and oxidative stress in Parkinson's disease: mechanisms, biomarkers, and therapeutic strategies

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Background: Parkinson's disease (PD) is the second most common neurodegenerative disorder, characterized by motor symptoms and progressive degeneration of dopaminergic neurons. Accumulating evidence indicates that mitochondrial dysfunction and oxidative stress are major contributors to PD pathogenesis.

Objectives: This review explores the molecular mechanisms underlying PD, emphasizing mitochondrial dysfunction and oxidative stress. It also examines genetic and environmental contributors, emerging biomarkers, and future treatment strategies.

Methods: An extensive literature review was conducted, focusing on mitochondrial biology, oxidative stress, genetic mutations, and environmental toxins relevant to PD. Investigations into treatment options – including redox therapies, gene therapies, and lifestyle approaches – were also examined.

Results: Mitochondrial dysfunction in PD includes disrupted oxidative phosphorylation and elevated reactive oxygen species (ROS). This also affects calcium homeostasis, especially in substantia nigra neurons. Genetic mutations (PINK1, Parkin, DJ-1, LRRK2, GBA) impair mitophagy and antioxidant defenses. Environmental toxins (e.g. MPTP, rotenone) further damage mitochondrial function and contribute to dopaminergic neuron loss. Emerging biomarkers involve measurements of lipid peroxidation and mitochondrial DNA damage. Promising therapeutic strategies include mitochondria-targeted antioxidants (e.g. MitoQ), PINK1-based gene therapy, Parkin activation, ketogenic diet, and exercise-induced mitochondrial biogenesis.

Conclusions: Mitochondrial dysfunction and oxidative stress are central to PD pathophysiology. Strategies targeting these mechanisms may slow disease progression. Future research should emphasize combination therapies and early intervention trials, alongside biomarker integration, to enhance clinical outcomes.

Keywords: Mitochondrial dysfunction; oxidative stress; Parkinson's disease

RESIDENTS

ORRD_01

Challenges in the implementation of Saksham Anganwadi in Ayodhya district: a way forward

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Background: The Saksham Anganwadi program faces multiple challenges limiting its effectiveness in reducing child malnutrition. Key issues include inadequate training and skill gaps among Anganwadi Workers, weak coordination between health and ICDS departments. The ICDS-Tracker App's effectiveness is hampered by poor internet connectivity, low digital literacy, and inconsistent data reporting. The Saksham Anganwadi program faces challenges such as inadequate training, high workload, low honorarium, weak supervision, poor coordination, and limited community awareness, which hinder its effectiveness in reducing child malnutrition. Addressing these challenges requires strengthened capacity building, supportive supervision, and localized strategies. Challenges in the implementation of Saksham Anganwadi in Ayodhya District: A Way Forward.

Method: It is a Qualitative study which will be conducted in Saksham Anganwadi of Masaudha Block, Ayodhya District. Anganwadi Workers will be selected by using purposive sampling until data saturation is reached. Through in-depth interviews using a semi-structured interview guide to explore their challenges, experiences, and perceptions. The results will be presented after completion of data analysis.

Results: The study highlighted several barriers in the implementation of Saksham Anganwadi. These included shortage of infrastructure and resources, irregular and inadequate honorarium, heavy workload with additional responsibilities, limited participation from the community, and considerable job-related stress. Together, these issues reduced the efficiency of Anganwadi workers and hampered smooth program delivery.

Conclusion: For effective functioning of Saksham Anganwadi, it is important to strengthen capacity building of workers, ensure timely and fair remuneration, provide supportive supervision, and encourage greater community involvement. Addressing these challenges will help in improving service delivery and achieving better health and nutrition outcomes among children.

Keywords: Saksham Anganwadi, Poshan 2.0, ICDS, Anganwadi Workers, Malnutrition, Training Challenges, Uttar Pradesh

ORRD_02

A comparative study to evaluate the serum lipid levels and lipoprotein (a) with pregnancy-induced hypertension and normotensive pregnant women at a tertiary care teaching hospital in Telangana

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Background: Blood pressure of 140/90 mm Hg or higher, without proteinuria and oedema after 20 weeks of pregnancy, is considered pregnancy-induced hypertension. A clinical characteristic of PIH can arise from endothelial dysfunction associated with dyslipidaemias. There is a clear correlation between the rise in plasma triglycerides and plasma cholesterol and the steady increase in mean serum oestradiol concentration from 10 to 35 weeks of pregnancy. Serum lipid concentration and serum Lipoprotein (a) levels may provide a useful marker for screening patients at risk for developing PIH. The study aims to assess and compare the serum levels of lipid and lipoprotein (a) in pregnant women with pregnancy-induced hypertension and normotensive pregnant women.

Methods: A case-control observational study was carried out at the Surabhi Institute of Medical Sciences, Siddipet, over 4 months with 30 cases of Pregnancy-induced hypertension and 30 age-matched controls.

Results: A total of 60 subjects were grouped into cases and controls. Their serum lipid profile and lipoprotein (a) levels were evaluated. The t-test was used as a test of significance for qualitative data. A p-value of <0.05 was considered statistically significant after assuming all the rules of statistical tests. Among cases, the mean total cholesterol was 179.3+ 30.18mg/dl, the mean serum triglycerides were 205.6 + 63.63 mg/dl, the mean HDL levels were 38.45 + 7.33 mg/dl, the mean LDL was 93.48 + 31.26 mg/dl, the mean VLDL was 44.23+ 14.37 mg/dl and the mean Lp(a) was 45.89 + 13.07 mg/dl.

Conclusion: This study concludes that elevated lipid profile and lipoprotein (a) levels were shown to be highly correlated with PIH, indicating that elevated lipids may play a role in the pathophysiology of PIH.

Keywords: Pregnancy-induced Hypertension, Gestational Hypertension, Preeclampsia, lipid profile, Lipoprotein (a).

ORRD_03

From clues to conclusion: Identifying snake envenomation through symptoms in Emergency department and saving Life

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Background: To identify snake bite through sign &symptoms in absense of history and marks and act efficiently to save life.

Methods: -Snake envenomation is a significant public health problem. WHO estimates over 5 million people are bitten by snakes annually, resulting in large number of deaths and permanent disability. These deaths can be stopped by prompt action taken by the emergency team. A case discussed here tells us timely intervention to be done by emergency team by identifying snake bite without any history or mark. A pt. aged 42 yrs, came to emergency department with complain of chest pain, abdominal pain and difficulty in breathing since 3hrs.No cardiac history, no visibly seen marks present on body, no redness or swelling seen. ptnt detoriated rapidly with drop in GCS, pt, Intubated. On examination B/L ptosis seen and forehead furrowing was present suggestive of snake bite.

Results: Prompt identification of sign without any significant history helped in recognition of the case. Anti snake venom was given, pt kept in ICU and was extubated in 24 hrs with significant improvement. photo and discussion of the case will be presented in the conference.

ORRD_04

Evaluation of Vitamin D and HbA1c in female alopecia

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Background: Telogen effluvium (shedding of hair due to larger proportion of hair follicles entering the resting phase of hair growth cycle), female pattern hair loss/androgenic alopecia (thinning of scalp hair in women due to follicle miniaturization), alopecia areata (patchy autoimmune hair loss), traumatic or cicatricial alopecia (hair loss from physical or chemical trauma), are the four main forms of alopecia. Recent studies have shown the role of Vitamin D deficiency and poor glycemic control in the causation of Telogen effluvium and female pattern hair loss.

Objectives: Our study aimed to evaluate serum vitamin D and HbA1c in female alopecia of TE and FPHL type

Methodology: This study was conducted in the Department of Biochemistry with Department of Dermatology, on 90 female alopecia women of age 15-45 years. Routine clinical examination was done and serum HbA1c, Vitamin D were measured by autoanalyzer and enzyme-linked immunosorbent assay (ELISA). Patients with alopecia areata, traumatic alopecia, pregnant women, malignancy, liver, skin and kidney diseases were excluded.

Results: Out of 90 female alopecia patients, vitamin D deficiency (< 20 ng/ml) was observed in 62% of patients with 72.2% among FPHL and 59.7% among TE patients and 10% of patients were diabetic (HbA1c ≥ 6.5%) with 22.2% among FPHL and 6.9% among TE. The mean of vitamin D (ng/ml) among total alopecia, FPHL and TE patients were (17±11.4), (13.8±8.3), (17.8±11.9) respectively. Mean of HbA1c (%) among total alopecia, FPHL, TE patients were (5.7±0.6), (5.9±0.8), (5.6±0.6) respectively.

Conclusion: In our study we observed decreased levels of serum vitamin D and raised HbA1c levels.

Keywords: Vitamin D, HbA1c, female alopecia

ORRD_05

Immunohistochemical Expression of IgG4 and C4d In Pemphigus Group of Disorders

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Background: Bullous autoimmune dermatoses are blistering disorders caused by autoantibodies targeting epidermal or basement membrane structures, Pemphigus vulgaris being the most common, diagnosed with DIF. IgG4 and C4d IHC offer practical alternatives in routine diagnostic settings. To evaluate the utility of immunohistochemical expression of IgG4 and C4d markers in Immunobullous skin disorders in resource poor settings.

Methods: 31 cases were collected ambispectively, stained with both IgG4 and C4d IHC. DIF data was collected for all the cases

Results: The study demonstrated that IgG4 and C4d IHC are reliable tools for diagnosing Pemphigus, with the combined panel showing high sensitivity (92%) and specificity (83.33%). Chi-square analysis confirmed statistically significant associations ($p < 0.05$). This study highlights the diagnostic value of IgG4 and C4d IHC in pemphigus, showing high sensitivity and specificity, especially when used in combination. The combined panel closely mirrored DIF results as seen in multiple previous studies. Limitations include absence of anti-DSG data, and limited sample size.

Conclusion: This study confirms that IgG4 and C4d IHC are effective diagnostic tools for vesiculobullous autoimmune dermatoses, especially when DIF is unavailable. IgG4 and C4d are useful for detecting pemphigus. Their combined use enhances diagnostic accuracy. Overall, IHC offers a practical and reliable alternative to DIF in routine pathology.

ORRD_06

Correlation of FT3 FT4, TSH, and serum electrolytes (Na+, K+, Mg2+, Ca^{2+} & PO_4^{3-}) with KFT in Chronic kidney disease patient (CKD) in a Tertiary care centre

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Background: Chronic kidney disease (CKD) is a progressive condition marked by irreversible loss of renal function. Declining kidney function is often accompanied by disturbances in endocrine and metabolic parameters. Notably, thyroid hormone levels FT3, FT4, and TSH) can be altered in CKD, and common serum electrolytes (sodium, potassium, calcium, magnesium, phosphorus) frequently become deranged as renal function worsens. **Aim:** This study aims to evaluate the correlations between thyroid function tests and serum electrolytes with kidney function in CKD patients. **Methods:** A cross-sectional observational study was conducted on 250 adult CKD patients (age 20–70) at a tertiary care hospital. Patients with any history of thyroid disorders or on thyroid-altering medications were excluded. Clinical data and laboratory measurements were collected, including FT3, FT4, TSH, serum creatinine, blood urea, uric acid, and electrolytes (Na+, K+, Ca2+, Mg2+, $PO_4$3-). Estimated glomerular filtration rate (eGFR) was calculated by the 4-variable MDRD formula, and CKD was staged according to 2012 KDIGO guidelines. Correlation analyses were performed between thyroid/electrolyte parameters and kidney function indices. **Results:** The mean eGFR of the cohort was 28 mL/min/1.73 m2 (range 5–90), with the majority of patients in CKD Stage 4 or 5. A high proportion of patients (approximately 60–70%) exhibited reduced FT3 levels, and about one-quarter had reduced FT4. Overt or subclinical hypothyroidism (elevated TSH) was noted in roughly 20% of cases. FT3 levels showed a significant positive correlation with eGFR ($p < 0.001$), whereas TSH levels correlated inversely with eGFR ($p < 0.01$), indicating worsened thyroid function in advanced CKD. Regarding electrolytes, serum potassium and magnesium levels increased progressively with CKD severity (negative correlation with eGFR, $p < 0.001$), while serum calcium levels declined (positive correlation with eGFR, $p < 0.001$). Serum phosphorus was normal in early CKD but rose sharply in advanced stages (Stage 4–5), correlating inversely with eGFR ($p < 0.001$). Serum sodium did not demonstrate a significant linear correlation with kidney function, remaining in the normal range for most patients except those with severe fluid imbalance. **Conclusion:** Thyroid hormone abnormalities (especially low FT3 and elevated TSH) are common in CKD and correlate with declining renal function, reflecting the intertwined pathophysiology of the thyroid and kidneys. Similarly, electrolyte disturbances including hyperkalaemia, hypermagnesemia, hypocalcaemia, and hyperphosphatemia – become more pronounced as kidney function deteriorates. These findings underscore the importance of routine monitoring of thyroid function and serum electrolytes in CKD patients. Early detection and management of thyroid dysfunction and electrolyte imbalances may help improve clinical outcomes and quality of life in this population. **Keywords:** GFR, CKD, S. Electrolytes

ORRD_07

The association of serum vitamin D and serum ferritin levels in anemic premenopausal women with uterine fibroid

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Background: Our study aimed to evaluate the association between serum vitamin D and serum ferritin levels in anemic and non anemic premenopausal women with Uterine Fibroid (UF).

Method: This case control study was conducted in the Department of Biochemistry, in collaboration with Department of Obstetrics and Gynaecology, on 96 premenopausal women, with UF (48 females associated with anemia and 48 females without anemia) of age 30-45 years. After obtaining detailed history and consent, fasting venous blood samples were collected. Routine hematological investigations were done using automated cell counter. Serum vitamin D and serum ferritin levels were measured by enzyme-linked immunosorbent assay (ELISA). Results were tabulated in Microsoft excel and analyzed using appropriate statistics.

Results: Out of 96 premenopausal women with uterine fibroid, statistically significant difference was observed in Haemoglobin (Hb) levels between the two groups. The median ferritin levels in cases was 6ng/ml, and that in control was 20ng/ml, and difference was found to be statistically significant ($p<0.01$). The median vitamin D level in fibroid cases with anemia was 7ng/ml and that in cases without anemia was 17ng/ml, difference was found to be statistically significant ($p<0.01$). A strong positive correlation was found between serum ferritin and vitamin D levels ($p<0.05$).

Conclusion: Serum ferritin levels decrease with decrease in vitamin D levels in premenopausal anemic women with UF as compared to premenopausal non anemic women with UF, thus depicting the importance of assessing vitamin D and ferritin levels in patients with UF.

Keywords: Ferritin, Vitamin D, Uterine Fibroid

ORRD_08

Unveiling Precision: The Analytical specificity and Standardization Imperative in Chromogranin A Measurement for Neuroendocrine Tumor Management.

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Background: Chromogranin A (CgA) is the most widely adopted general circulating biomarker for the diagnosis, prognosis, and monitoring of Neuroendocrine Tumours (NETs), neoplasms arising from the diffuse neuroendocrine system. As CgA is co-secreted from secretory granules, elevated serum or plasma levels often correlate with increased tumor burden. However, CgA is non-specific; levels are influenced by factors like Proton Pump Inhibitor (PPI) use, renal dysfunction, and the proteolytic processing of the CgA precursor into various circulating fragments.

Aim and Objective: The primary analytical challenge in utilizing CgA is the lack of standardization among conventional antibody-based immunoassays, such as Enzyme-Linked Immunosorbent Assays (ELISAs). This variability arises from different kits recognizing different CgA fragments, leading to inconsistent results and hindering inter-study comparisons. The objective is to evaluate advanced analytical techniques, specifically Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS), as a superior, standardized alternative for CgA quantification.

Methodology: ELISA utilizes specific antibodies to capture and quantify CgA, offering a cost-effective but non-fragment-specific measurement. Conversely, LC-MS/MS involves extracting CgA from the biological matrix, digesting it with trypsin, and quantifying highly specific, unique signature peptides. This antibody-free approach allows for direct molecular structure measurement, often using internal standards to improve quantitative accuracy and reproducibility. Comparative studies assess the correlation, dynamic range, and specificity of both methods.

Conclusion: While ELISAs are accessible, their reliance on variable antibody affinity compromises specificity, leading to clinically significant discordance. LC-MS/MS offers a more analytically sensitive, reproducible, and fragment-specific quantification of CgA. The adoption of standardized LC-MS/MS methods could resolve the longstanding analytical ambiguity of CgA assays, significantly improving the reliability of this crucial marker in the clinical management and monitoring of NET patients.

Keywords: Neuroendocrine Tumors (NETs), Chromogranin A (CgA), ELISA, LC-MS/MS, Biomarker, Standardization.

ORRD_09

Gene-Environment Interaction in CKDu: The Role of CYP2B6 Polymorphism in Malathion-Induced Renal Toxicity

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Background: Cytochrome P450 enzymes (CYPs) play a major role in the metabolism of xenobiotics, including organophosphate pesticides such as malathion. Genetic variations in these enzymes may influence susceptibility to kidney injury. This study explored the interplay between malathion exposure and the CYP2B6*TT (rs3745274) genotype in patients with chronic kidney disease of unknown etiology (CKDu).

Methodology: A case–control study was carried out with 76 individuals diagnosed with CKDu and 57 age- and sex-matched healthy controls. CKDu diagnosis followed KDIGO criteria. Serum urea and creatinine levels were quantified using a Beckman Coulter analyzer, and estimated GFR was derived from the CKD-EPI formula. CYP2B6 genotyping was performed through restriction fragment length polymorphism. Malathion concentrations in serum and urine were assessed using GC-MS/MS, and urine malathion levels were adjusted with urinary creatinine for accurate results.

Results: Serum malathion concentrations were significantly elevated in CKDu patients compared to controls [0.43 (0.26–0.55) vs. 0.23 (0.18–0.39); $p < 0.0001$]. Conversely, creatinine-adjusted urinary malathion levels were markedly lower in CKDu patients [0 vs. 0.17 (0.08–0.36); $p < 0.0001$]. Individuals carrying the CYP2B6*TT genotype exhibited a higher risk of CKDu (OR = 2.84; $p < 0.026$). Among genotype-positive CKDu subjects, serum creatinine showed a moderate negative correlation with eGFR ($r = 0.578$; $p < 0.0001$).

Conclusions: This study highlights a possible gene–environment interaction in CKDu. Elevated serum malathion levels alongside the CYP2B6*TT polymorphism may contribute to renal impairment. These findings support the need to consider genetic susceptibility in environmental exposure-related CKDu.

Keywords: CKDu, CYP2B6, Malathion, eGFR, GC-MS/MS

ORRD_10

Out of Pocket Expenditure among Animal Bite Patients attending Anti Rabies clinic

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Context: The global goal is to achieve "ZERO BY 30" under the National Action Plan for Dog Mediated Rabies Elimination – an initiative taken by the government to eradicate rabies by 2030.The study was conducted with aim to estimate the out-of-pocket expenditure (OOPE) incurred by animal bite victims and its determinants.

Aims: To estimate the out-of-pocket expenditure incurred by animal bite victims for post exposure prophylaxis against rabies in Lucknow district

Settings and Design: A cross-sectional study was conducted at the two anti-rabies clinics in public sector across Lucknow district

Methods and Material: 203 animal bite patients who were registered in the two anti-rabies clinics in public sector across Lucknow district were interviewed using a semi structured interview schedule to access the direct, indirect and total cost and its determinants.Patients were interviewed twice , physically at the end of 3rd dose (7th day) and telephonically at the end of last dose of post exposure prophylaxis (28th day) of rabies vaccine.

Statistical analysis used: To measure the association for categorical dataset and for continuous variable, chi square test, Mann Whitney U & Kruskal Wallis was used respectively. Multivariate regression was used to identify the predictors for Direct and indirect cost and other independent variables.

Results: On regression analysis the variable "literacy of the head of the family" comes out to be the significant predictor for direct expenditure. On regression multivariate regression analysis the variable 'literacy of the head of the family' and 'middle class' socioeconomic class had lower odds of occurrence of indirect cost compared to lower class (V).

Conclusions: Primary care physicians are crucial for early identification and prevention of rabies through vaccination. However, Out-of-pocket expenditure (OOPE) is a significant burden for victims, with lower socioeconomic classes experiencing higher indirect costs. Therefore, improving awareness, accessibility, and financial protection for vulnerable groups is essential.

Key-words: Out of pocket expenditure, Human Rabies Immunoglobulin, Anti Rabies Vaccine

ORRD_11

Assessment of Rabies Awareness and Animal Bite Response Behaviours Among Morning Walkers in Lucknow City

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Introduction: Rabies is a neglected zoonotic tropical disease that is 100% fatal but vaccine-preventable. It causes an estimated 59,000 deaths annually across more than 150 countries, with 95% of cases in Africa and Asia. India accounts for about 36% of global rabies deaths, making it a major public health concern. Urban residents engaged in early-morning outdoor activities, such as morning walking, are frequently exposed to free-roaming dogs, increasing their risk of animal bites. Assessing their awareness and response practices is essential for targeted prevention efforts. This study evaluates rabies awareness and animal-bite response behaviours among morning walkers in Lucknow, Uttar Pradesh.

Methods: A cross-sectional, questionnaire-based survey was conducted among adult morning walkers across selected public parks and walking tracks in Lucknow. Participants were recruited using a convenient sampling technique. A pretested, structured questionnaire assessed demographic details, knowledge of rabies transmission, symptoms, prevention, and post-exposure prophylaxis (PEP), as well as behavioural responses following dog bites or exposure incidents.

ORRD_12

Knowledge and Attitude in Management of Animal bite among Nursing Students

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Introduction: Animal bites are a major public health issue in India, with dog bites causing 76–94% of cases and posing a serious risk of rabies, a preventable but fatal disease. Nurses are central to early wound care, counselling, and ensuring compliance with PEP, making their knowledge and attitude crucial for rabies prevention. However, studies report gaps, misconceptions, and inconsistent practices among healthcare trainees. This study therefore aims to assess the knowledge and attitude regarding animal bite management among nursing students at Dr. Ram Manohar Lohia Institute of Medical Sciences (Dr. RMLIMS), Lucknow.

Methods: A cross-sectional, questionnaire-based study was conducted among nursing students enrolled at Dr. RMLIMS from various academic years. Participants were evaluated using a structured, pre-validated questionnaire assessing knowledge and attitudes related to animal bite management. Participants were selected using a convenient sampling method after obtaining informed consent. Knowledge responses were scored using a predefined scoring system, and attitude was assessed on a Likert scale.

ORRD_13

Study of Oral Hygiene and Addiction in Youth attending Dental OPD

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Introduction: Poor oral hygiene and addictive habits such as tobacco, alcohol, and betel-nut use significantly contribute to oral diseases among youth. In India, dental caries and periodontal problems remain highly prevalent, with national studies reporting 50–62% caries rates in children and adolescents. Dental OPDs provide a crucial opportunity for early identification of risky behaviours and oral health issues. Assessing oral hygiene practices and addiction patterns among youth attending a dental OPD can support targeted counselling and preventive strategies. This study aims to assess oral hygiene behaviours and addictive habits among youth attending dental OPD at Dr. Ram Manohar Lohia Medical Sciences (Dr. RMLIMS), Lucknow and to analyse their association with oral health status

Methods: A cross-sectional study was conducted among youth aged 15–29 years attending the dental OPD of Dr. RMLIMS. Participants were selected using consecutive sampling, wherein every eligible patient visiting the OPD during the study period and willing to participate was included. After obtaining informed consent, data were collected using a pre-tested structured questionnaire covering oral hygiene practices and addictive habits.

ORRD_14

An observational study to find out correlation of serum levels of vitamin D, calcium and magnesium in adult female patients suffering from depression at Sawai Man Singh Medical College and Attached Hospitals, Jaipur

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Background: Vitamin D itself known as a secosteroid hormone, recognized as a neuroprotective factor which plays a role in brain development. Calcium is a bivalent cation that has been reported to correlate with depression in female adults. Magnesium is a bivalent cation which acts as a coenzyme or an activator for many enzymatic systems, The regulating effect of magnesium on N-methyl-D-aspartate (NMDA) channels makes it an important factor in the treatment of depression. Hypomagnesaemia promotes development of mental disorders.

Aim: To study the correlation of serum levels of vitamin D, calcium and magnesium in adult female patients suffering from depression.

Methodology: This study was conducted in 100 women Age 18-44 at Department of Psychiatry of Sawai Man Singh Medical College and associated Hospitals. The correlation of serum Vitamin D, serum calcium and serum magnesium levels was assessed.

Results: The mean (SD) of the serum levels of vitamin D, calcium, and magnesium were 15.53 (13.41) (ng/ml), 9.14 (0.24) (mg/dL), and 2.07 (0.13) (mg/dl), respectively. Women's depression scores showed a significant inverse correlation with the serum level of vitamin D ($r= -0.21$, $P= 0.03$).

Conclusion: The results showed that women's depression scores had a significant inverse correlation with the serum level of vitamin D.

Keywords: Depression, Vitamin D, Magnesium, Calcium, Adult females

ORRD_15

An observational study to compare serum vitamin D level among newly diagnosed patients of pulmonary tuberculosis and healthy controls at Sawai Man Singh Medical College and Attached Hospitals, Jaipur

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Background: Vitamin D has a significant role in host immune defense against Mycobacterium tuberculosis. It has been suggested that pulmonary tuberculosis may be associated with lower levels of vitamin D, deficiency of vitamin D will predispose individuals to such infections. Present study was therefore undertaken to identify the association between vitamin D deficiency and pulmonary tuberculosis

Aim: To compare the levels of serum vitamin D in newly diagnosed patients of pulmonary tuberculosis and healthy individuals.

Methodology: A case-control study was conducted in Department of respiratory medicine, SMS Medical college, Jaipur including 50 adult newly diagnosed sputum positive pulmonary tuberculosis patients as cases and 50 age and sex-matched healthy participants as control groups. Vitamin D levels were analyzed and compared with data obtained from healthy controls.

Results: In both groups, the majority were men (88%). Serum vitamin D levels were significantly lower (P = 0:012) in the tuberculosis group [Mean Vitamin D=19 (7.75~27.25) ng/dl] as compared to the control group [Mean Vitamin D=25 (19.75~32.00) ng/dl]. Out of 50 TB patients, 27 (54%) had vitamin D deficiency, while among healthy controls, only 13 (26%) had vitamin D deficiency.

Conclusion: The prevalence of vitamin D deficiency in pulmonary tuberculosis cases is very high.
Keywords: Pulmonary Tuberculosis, Vitamin D, Calcium

ORRD_16

Comparison Of Serum Lipid Levels Between Gout and Healthy Individuals at SMS Medical College, Jaipur, Rajasthan

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Background: Gout is a common type of inflammatory arthritis marked by repeated episodes of joint pain caused by the accumulation of monosodium urate crystals, stemming from elevated uric acid levels (hyperuricemia). It is frequently linked with metabolic syndrome, particularly dyslipidemia, a major contributor to cardiovascular disease risk. This study aims to evaluate and compare serum lipid profiles—total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), and triglycerides (TG)—in individuals with gout and healthy controls at SMS Medical College and its affiliated hospitals in Jaipur, Rajasthan.
Method: This cross-sectional study included a total of 240 participants, consisting of 120 gout patients diagnosed based on clinical criteria and elevated serum uric acid levels, and 120 age- and sex-matched healthy controls, all recruited from the Department of Rheumatology at the Institute. Serum lipid profiles were assessed using standard laboratory methods, and the mean lipid levels between the two groups were compared using an unpaired t-test for statistical analysis.
Results: The mean serum lipid levels in individuals with gout showed significant differences when compared to healthy controls. Gout patients had a higher mean total cholesterol (TC) level of 220 mg/dL, in contrast to 185 mg/dL in the control group ($p < 0.001$). The average high-density lipoprotein cholesterol (HDL-C) level was lower in gout patients at 38 mg/dL, compared to 50 mg/dL in healthy individuals ($p < 0.001$). Similarly, the mean low-density lipoprotein cholesterol (LDL-C) level was elevated in gout patients at 145 mg/dL, whereas it was 110 mg/dL among controls ($p < 0.001$). Furthermore, the mean triglyceride (TG) level in the gout group was 180 mg/dL, significantly higher than the 130 mg/dL observed in the healthy group ($p < 0.001$).
Conclusion: The results of this study demonstrate that individuals with gout have significantly elevated levels of total cholesterol, LDL-C, and triglycerides, along with reduced HDL-C levels when compared to healthy controls. This pattern of dyslipidemia may play a role in the heightened cardiovascular risk commonly associated with gout. These findings highlight the need for regular lipid profile monitoring in the management of gout and suggest that targeting dyslipidemia could be advantageous in mitigating the broader health risks linked to the condition.
Keywords: Gout, serum lipid levels, total cholesterol, HDL-C, LDL-C, triglycerides, dyslipidemia, cardiovascular risk.

ORRD_17

A Cross-Sectional Study of Serum Vitamin D Level In Children With Recurrent Acute Tonsillitis And Healthy Controls At SMS Medical College, Jaipur

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Background

Recurrent acute tonsillitis is a common reason for paediatric hospital visits and one of the leading indications for tonsillectomy. The underlying mechanisms predisposing to recurrence are not fully elucidated, but emerging evidence highlights a potential link between vitamin D deficiency and recurrent tonsillar infections. Vitamin D plays a crucial role in immune regulation by modulating innate and adaptive responses, enhancing antimicrobial peptide synthesis, and reducing inflammation. Deficiency in vitamin D may therefore increase susceptibility to repeated infections of the upper respiratory tract, including tonsillitis.

Aim

To compare serum vitamin D levels in children with recurrent acute tonsillitis and healthy controls, and to evaluate the association of vitamin D deficiency with recurrence of tonsillar infections.

Methodology

This hospital-based case-control study was conducted in the Departments of Biochemistry and ENT, S.M.S. Medical College and Attached Hospitals, Jaipur. A total of 100 children aged 2–14 years were enrolled, comprising 50 diagnosed cases of recurrent acute tonsillitis and 50 healthy age-matched controls. Serum vitamin D levels were estimated using the ADVIA Centaur XP chemiluminescent immunoassay system. Data were statistically analysed using Student's t-test and chi-square test, with $p < 0.05$ considered significant.

Results and Conclusion

Mean serum vitamin D levels were significantly lower in children with recurrent acute tonsillitis (17.95 ± 6.42 ng/mL) compared to healthy controls (28.64 ± 7.25 ng/mL; $p < 0.001$). Vitamin D deficiency (< 20 ng/mL) was observed in 68% of cases versus 22% of controls. A negative correlation was found between vitamin D levels and frequency of tonsillitis episodes. No significant association was noted with gender or socioeconomic status. Serum vitamin D deficiency is significantly associated with recurrent acute tonsillitis in children. Routine assessment and correction of vitamin D status may help reduce recurrence and improve immune resistance in susceptible paediatric populations.

Keywords

Vitamin D; Recurrent tonsillitis; Children; Immunity; Case-control study

ORRD_18

Comparative Evaluation of Iron, Vitamin B12, and Folic Acid Levels in Hypothyroid Patients and Euthyroid Controls at SMS Medical College, Jaipur, Rajasthan

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Background: Thyroid hormones are essential for development, metabolism, and signalling. Hypothyroidism, a common endocrine disorder with reduced thyroid hormone production, is frequently associated with deficiencies in iron, vitamin B12, and folic acid, which can worsen symptoms. This study aims to compare and correlate serum levels of these nutrients and thyroid hormones (free T3, free T4, and TSH) in hypothyroid patients and euthyroid controls at SMS Medical College, Jaipur.

Method: This cross-sectional study included hypothyroid patients (N=30) and euthyroid controls (N=30). Serum levels of TSH, T3, T4, vitamin B12, folic acid, and ferritin were measured using chemiluminescence immunoassay. An unpaired t-test was conducted to compare groups, and Pearson correlation determined associations between variables, with significance set at $p < 0.05$.

Results: Hypothyroid patients had significantly elevated TSH levels (6.98±1.45) compared to controls (1.92±1.05, $p<0.0001$) and lower T3 (0.48±0.25 vs. 1.36±0.19, $p<0.0001$) and T4 (3.27±1.41 vs. 6.12±1.18, $p<0.0001$). Vitamin B12, folic acid, and ferritin levels were also significantly reduced in hypothyroid patients (248.27±132.30 pg/mL, 2.10±0.78 ng/mL, 25.18±1.87 ng/mL) versus controls (498.93±212.42 pg/mL, 5.98±0.87 ng/mL, 67.43±2.80 ng/mL; all $p<0.0001$). A positive correlation was noted between TSH and folic acid in hypothyroid patients ($r=0.210$, $p=0.010$), though no significant correlation was found between TSH and either vitamin B12 or ferritin.

Conclusion: These findings suggest hypothyroid patients are at increased risk for deficiencies in these nutrients, which may worsen metabolic and hematologic disturbances associated with thyroid dysfunction. Routine screening and management of these deficiencies in hypothyroid patients could improve clinical outcomes and quality of life.

Keywords: Hypothyroidism, vitamin B12, folic acid, iron, thyroid hormones, serum levels, nutritional deficiencies

ORRD_19

An Observational Study for Comparison of Serum Alkaline Phosphatase, Serum Calcium and Serum Phosphorus in Type II Diabetes Mellitus Patients With Normal Healthy Individuals at S.M.S Medical College and Hospital

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Background: Diabetes is a metabolic disorders marked by hyperglycemia due to insulin secretion and action defects. Type II Diabetes Mellitus negatively impacts bone quality. Serum Alkaline Phosphatase, Serum Calcium and Serum Phosphorus serve as key bone indicators.

Aim: To compare the levels of Serum Alkaline Phosphatase, Serum Calcium and Serum Phosphorous in Type II Diabetes mellitus Patients with normal healthy individuals at S.M.S Medical College and Hospital, Jaipur.

Methodology: This study was conducted between age group of 30 and 65 years in Department of Biochemistry and Medicine at S.M.S Medical College and Hospital, Jaipur. Serum ALP, Serum Calcium and Serum Phosphorous were measured in 60 cases and 60 age matched controls.

Results: Mean serum ALP is 265.508± 65.89 IU /L in cases and 150.53 ±28.69 IU/L in controls. Mean Serum Calcium is 7.12±0.96mg/dl in cases and 8.91±0.89mg/dl in controls. Mean Serum Phosphorous is 5.85±0.25mg/dl in cases and 4.24±0.78mg/dl in controls.

Conclusion: The results shows that alterations in the levels of Serum ALP, Serum Calcium and Serum Phosphorous may be associated with Type II Diabetes Mellitus.

Keywords: Alkaline Phosphatase, Calcium, Phosphorus, Type II Diabetes Mellitus

ORRD_20

A Cross-Sectional Study of Serum Levels of Electrolytes (Na^+, K^+, Cl^-), Calcium, Phosphorus and Magnesium In Hypothyroid Patients And Healthy Controls at SMS Medical College & Hospital, Jaipur

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Background: Hypothyroidism, a prevalent endocrine disorder characterized by insufficient production of thyroid hormones, has significant implications for various physiological processes, including metabolism, growth, and development. Electrolytes such as sodium (Na^+), potassium (K^+), and chloride (Cl^-) are essential for maintaining cellular function, fluid balance, and nerve conduction. Previous investigations found electrolyte abnormalities in hypothyroidism. This study aimed to evaluate and compare serum electrolytes (Na^+, K^+, Cl^-), calcium, phosphorus, and magnesium levels between hypothyroid patients and healthy controls and assess correlations with thyroid markers (fT3, fT4, TSH).

Method: This cross-sectional study was conducted at SMS Medical College and Hospital, Jaipur, involving 150 diagnosed hypothyroid patients and 150 age- and sex-matched healthy controls. Serum levels of electrolytes, calcium, phosphorus, magnesium and thyroid profile markers (fT3, fT4, TSH) were analyzed using a fully automatic chemistry analyzer. Statistical analysis included group comparisons using t-tests and correlation assessments using Pearson's correlation coefficient.

Results: Compared to controls, hypothyroid patients showed significantly lower serum sodium (132.23 ± 1.06 mmol/L vs. 136.66 ± 1.47 mmol/L, $p < 0.001$), serum potassium (4.18 ± 0.25 mmol/L vs. 4.36 ± 0.31 mmol/L, $p < 0.001$), serum chloride (101.23 ± 1.06 mmol/L vs. 102.66 ± 1.47 mmol/L, $p < 0.001$), calcium (7.45 ± 0.27 mg/dL vs. 10.99 ± 0.36 mg/dL, $p < 0.001$), phosphorous (2.17 ± 0.61 mg/dl vs. 3.91 ± 0.28 mg/dl, $p < 0.001$) and magnesium levels (1.79 ± 0.12 mg/dL vs. 2.41 ± 0.10 mg/dL, $p < 0.001$). Pearson's correlation analysis revealed a strong negative association between TSH and calcium ($r = -0.61$, $p = 0.005$) and phosphorus ($r = -0.67$, $p = 0.01$) and magnesium ($r = -0.238$, $p = 0.02$) in hypothyroid patients.

Conclusion: Hypothyroidism is associated with distinct alterations in serum electrolyte and mineral levels, which may have implications for the management of patients with this condition. Understanding these biochemical changes is crucial for clinicians in optimizing treatment strategies and monitoring potential complications related to electrolyte imbalances.

Keywords: Hypothyroidism, Serum Electrolytes, Calcium, Phosphorus, Magnesium, Thyroid Profile.

ORRD_21

A Cross Sectional Study For Association of Serum Vitamin D3 Levels with Mammographic Breast Density and Hormone Receptor Status in Women Presenting With Breast Lump at Sawai Man Singh Medical College & Attached Hospitals, Jaipur

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Background: Breast cancer is the most diagnosed cancer and leading cause of deaths occurring in females. During past few years, both incidence and mortality rates have been increased in developing countries like India and others. Among various pathways, vitamin D signaling pathway is potential candidate for elucidation of newer avenues in breast cancer management. It exerts its effects via VDR, which is found in breast epithelial cells. As breast epithelium is affected by vitamin D, it may have a direct effect on breast density and the risk of breast cancer. Our aim was to study the serum levels of vitamin D in women presenting with breast lump, and to study the association, if any, between vitamin D levels, mammographic breast density and molecular subtypes of breast cancer.

Aim: To study the association of Serum Vitamin D3 levels with mammographic breast lump density and hormone receptor status in women presenting with breast lump.

Method: A research study was conducted in 200 women presenting with Breast lump at Sawai Man Singh Medical College and associated Hospitals. The correlation of serum Vitamin D levels with Mammographic Breast Density and Hormone Receptor status was studied.

Results: Vitamin D levels were assessed in these females and a significant direct correlation was observed between lower levels of serum vitamin D3 with higher breast density and TNBC subtype.

Conclusion: Our study shows that vitamin D deficiency has a significant relationship with breast cancer (v. benign breast disease), high lump density (showing increased breast cancer risk) and poor prognosis triple-negative breast cancer. Vitamin D deficiency could be an important, potentially modifiable, risk factor for the prevention of breast cancer in susceptible populations.

Keywords: Breast cancer, Vitamin D, TNBC subtype, Breast lump density.

ORRD_22

Serum Vitamin D, Calcium, Parathyroid Hormone and Alkaline Phosphatase Levels in Acute Spinal Cord Injury Patients at A Tertiary Care Hospital in Jaipur

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Background: Vitamin D is a fat-soluble pro-hormone essential for calcium–phosphate homeostasis and musculoskeletal integrity. Spinal cord injury (SCI) leads to immobilization, reduced sunlight exposure, and metabolic alterations predisposing to vitamin D deficiency. Deficiency in turn contributes to bone loss, delayed fracture healing, and secondary hyperparathyroidism. Data on vitamin D status in acute-onset SCI patients from Indian populations—especially in North India—remain limited.

Aim: To evaluate serum vitamin D, calcium, parathyroid hormone (PTH), and alkaline phosphatase (ALP) levels in patients with acute onset spinal cord injury and to explore their inter-relationships.

Methodology: A hospital-based cross-sectional study was conducted in the Departments of Biochemistry and Physical Medicine & Rehabilitation, S.M.S. Medical College & Hospitals, Jaipur. A total of 200 patients (≥ 18 years) with acute (< 6 weeks) spinal cord injury were included after ethical approval and informed consent. Serum 25(OH)D, calcium, intact PTH, and ALP were measured using standard immunoassay and photometric methods (ADVIA Centaur XP system and AU-5811 Analyzer). Data were analyzed for mean ± SD, proportions, and correlation among biochemical variables using appropriate statistical tests.

Results and Conclusion: Mean serum 25(OH)D levels among acute SCI patients were 28.4 ± 9.6 nmol/L, with nearly two-thirds (≈ 65 %) exhibiting vitamin D insufficiency (< 50 nmol/L) and about one-quarter (≈ 23 %) showing frank deficiency (< 25 nmol/L). Serum calcium showed a mild downward trend, whereas PTH and ALP were significantly elevated in vitamin D-deficient subjects ($p < 0.05$), indicating early secondary hyperparathyroidism. A significant inverse correlation was found between serum vitamin D and PTH ($r = –0.41$, $p < 0.01$) as well as ALP ($r = –0.36$, $p < 0.05$). These findings suggest that vitamin D deficiency is highly prevalent in acute SCI patients even at admission, emphasizing the need for routine screening and timely supplementation to prevent long-term skeletal complications.

Keywords: Spinal Cord Injury, Vitamin D, Calcium, Parathyroid Hormone, Alkaline Phosphatase, Metabolic Bone Health

ORRD_23

An Observational Study to Find Out Association of Serum Prolactin and FSH with Disease Activity in Premenopausal Females with Rheumatoid Arthritis at S.M.S. Medical College and Attached Hospitals, Jaipur, Rajasthan

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Background: Rheumatoid arthritis (RA) is the most prevalent chronic inflammatory joint disease affecting 0.5% to 1% of people in industrialized countries. It occurs more frequently in women than in men, with a ratio of 2-3:1. Gonadal sex hormone dysfunction is frequently reported in patients with Rheumatoid arthritis (RA). The relationship of these hormones with disease activity is still not clear and whether the hormone imbalance leads to increased severity of RA is not well studied. The present study aimed to find out association of serum Prolactin and FSH with Disease activity in Premenopausal female with Rheumatoid arthritis.

Methodology: This is a hospital based cross sectional observational study. This study was conducted on 120 premenopausal females with definite Rheumatoid arthritis attending OPD of Department of Rheumatology attached to SMS Hospital Jaipur (rajasthan). Serum Prolactin and FSH level was evaluated along Routine Biochemistry and CBC.

Results: The current study shows a higher level of serum Prolactin and FSH with the Higher disease activity (as measured by DAS28) of Rheumatoid arthritis in Premenopausal females.

Conclusion: Our Study shows direct association of serum Prolactin and FSH level with the disease activity of Rheumatoid arthritis. Thus serum Prolactin and FSH level can be a useful marker to assess the disease activity in Rheumatoid arthritis patients.

Keywords: Serum Prolactin, FSH, Rheumatoid Arthritis (RA), Disease activity, Premenopausal female

ORRD_24

A Comparative Study of Serum Procalcitonin Levels in Bacterial and Viral Meningitis in Paediatric Patients at SMS Medical College & Attached Hospitals, Jaipur

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Background: Meningitis remains a significant cause of morbidity and mortality among children worldwide. The clinical features of bacterial and viral meningitis often overlap, making early differentiation difficult using conventional cerebrospinal fluid (CSF) parameters and inflammatory markers such as C-reactive protein. Serum procalcitonin (PCT), a peptide precursor of calcitonin, rises markedly in bacterial infections but remains low in viral infections. This difference makes PCT a promising diagnostic biomarker for distinguishing bacterial from viral meningitis in paediatric patients.

Aim: The present study was undertaken to compare serum procalcitonin levels in paediatric patients with bacterial and viral meningitis and to assess its diagnostic significance in differentiating between the two conditions.

Methodology: A hospital-based comparative observational study was conducted in the Departments of Biochemistry and Paediatrics, S.M.S. Medical College and Attached Hospitals, Jaipur. Seventy children aged 1–18 years diagnosed with meningitis were enrolled and divided equally into two groups—bacterial meningitis and viral meningitis—based on clinical features, CSF findings, and culture or PCR results. Serum procalcitonin levels were estimated using an automated chemiluminescent immunoassay analyzer, and data were statistically analysed using Student's t-test and chi-square test, with $p < 0.05$ considered significant.

Results and Conclusion: The mean serum procalcitonin level was significantly higher in bacterial meningitis (2.95 ± 1.85 ng/mL) than in viral meningitis (0.46 ± 0.24 ng/mL; $p < 0.001$). At a diagnostic cutoff of 0.5 ng/mL, PCT showed 95% sensitivity and 85% specificity in detecting bacterial meningitis, outperforming conventional markers such as C-reactive protein and total leukocyte count. Serum procalcitonin is a rapid, reliable, and specific biomarker for early differentiation between bacterial and viral meningitis in children. Incorporating PCT testing into routine diagnostic evaluation can improve accuracy, reduce unnecessary antibiotic use, and support timely clinical decision-making.

Keywords: Procalcitonin; Bacterial meningitis; Viral meningitis; Paediatric infections; Biomarker

ORRD_25

An observational study to compare serum gamma glutamyl transferase in stable and acute exacerbations of chronic obstructive pulmonary disease patients at SMS Medical College and attached hospitals, Jaipur

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Background: Chronic Obstructive Pulmonary Disease (COPD) is a heterogeneous lung disorder that is characterized by chronic respiratory symptoms (such as dyspnea, cough, sputum production, exacerbation) due to abnormalities of the airways and/or alveoli that cause persistent, often progressive airflow obstruction. COPD is significant cause of morbidity and mortality throughout the world.One of the most important factors in the pathogenesis of COPD (chronic obstructive pulmonary disease) is ox- idative stress. GGT (gamma-glutamyltransferase) has been regarded as a novel marker of oxidative stress over the last few years. This study aimed to compare the serum levels of GGT during stable and acute exacerba- tions of COPD at a single center.

Method– This was a prospetive observational study. This study was conducted on 20 stable patients of COPD and 20 acute exacerbation patients of COPD attending OPD of Department of Respiratory medicine attached to Sawai man singh hospital Jaipur (rajasthan). Serum GGT was evaluated along Routine Biochemistry and CBC.Methodology

Result– The current study shows a serum GGT was increased with increase in the severity of airflow obstruction in Chronic Obstructive Pulmonary Disease patients comparative to Stable COPD patients.Results

Conclusion: Our Study showed serum GGT is significant increase in acute exacerbation of Chronic Obstructive Pulmonary Disease Patient comparative to stable COPD patients. Thus serum GGT can be a useful marker to monitor the disease severity in addition to spirometric parameters like FVC, FEV1 and FEV1/FVC.

Keywords: Serum GGT, Chronic Obstructive Pulmonary Disease (COPD)

ORRD_26

A Comparative Study to Evaluate Serum Ferritin and Serum Iron Levels in Hypothyroid and Euthyroid Pregnant Women During the First Trimester of Pregnancy at Sawai Man Singh Medical College and Attached Hospitals, Jaipur

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Background: The association between hypothyroidism and iron-deficiency anemia (IDA) in pregnancy is not well established. Hence, this study aimed to investigate the association between hypothyroidism and IDA during the first trimester of pregnancy.
Aim:To compare Serum Ferritin and Serum Iron levels in Hypothyroid and Euthyroid pregnant women during the first trimester of pregnancy.
Objectives:
Primary objectives:
1.To determine Serum Ferritin, Serum Iron levels in Hypothyroid & Euthyroid pregnant women during the first trimester of pregnancy.
2.To determine Hemoglobin levels in Hypothyroid & Euthyroid pregnant women during the first trimester of pregnancy.
3.To compare Serum Ferritin and Serum Iron levels in Hypothyroid & Euthyroid pregnant women during the first trimester of pregnancy.
Secondary objective:
1.To find out the correlation of Serum ferritin and Serum Iron with Thyroid profile in the first trimester of pregnancy.
Methodology: A comparative study was conducted in the Department of Obstetrics & Gynaecology, SMS Medical college, Jaipur. In this study, a total of 60 pregnant women were included. Thyroid-stimulating hormone (TSH), free T4 (FT4), free T3 (FT3), and ferritin were measured. Based on TSH values, pregnant women were divided into the following two groups: euthyroid (n = 30) and hypothyroid (n = 30).
Results: There was a significant increase in TSH levels and a significant decrease in the levels of FT4, FT3, ferritin, iron, and hemoglobin (Hb) in hypothyroid pregnant women compared to euthyroid pregnant women. The correlation and regression analysis revealed a significant negative association of TSH and a positive association of FT4 with ferritin, iron, and Hb.
Conclusion: These findings demonstrate the association of hypothyroidism with IDA during the first trimester of pregnancy. Further studies with thyroxine therapy in hypothyroid pregnant women and its impact on IDA will open novel therapeutic approaches in the management of IDA during pregnancy. Further, measurement of serum ferritin during pregnancy may provide valuable information in the diagnosis and management of IDA.
Keywords: Hemoglobin, iron-deficiency anemia, ferritin, hypothyroidism, pregnancy

ORRD_27

Comparison Of Vitamin D Levels in Patients with Vitiligo And Healthy Controls at SMS Medical College, Jaipur, Rajasthan

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Background: Vitiligo is an autoimmune skin disorder characterized by the progressive loss of melanocytes, resulting in depigmented patches on the skin. the underlying cause of vitiligo remains largely unknown. The role of vitamin D in vitiligo has gained attention due to its potential influence on immune regulation and melanogenesis. This study aims to compare serum vitamin D levels between patients with vitiligo and healthy controls at SMS Medical College and attached hospital, Jaipur, Rajasthan, to assess the association between vitamin D deficiency and vitiligo.
Method: A total of 60 participants were enrolled in the study from the Department of Skin & VD, consisting of 30 patients diagnosed with vitiligo and 30 age- and sex-matched healthy controls. Serum levels of 25-hydroxyvitamin D (25(OH)D) were measured using enzyme-linked immunosorbent assay (ELISA). Unpaired t-test analysis was performed to compare the mean vitamin D levels between the two groups, with a significance level set at $p < 0.05$.
Results: The mean serum vitamin D level in the vitiligo group was found to be 15.2 ng/mL (± 5.1), while the healthy control group had a mean level of 28.6 ng/mL (± 6.3). The difference in vitamin D levels between the two groups was statistically significant, with a p-value of < 0.001.
Conclusion: The study demonstrates that patients with vitiligo have significantly lower serum vitamin D levels compared to healthy controls. This deficiency may contribute to the autoimmune mechanisms involved in vitiligo pathogenesis. Further research is warranted to explore the therapeutic potential of vitamin D supplementation in managing vitiligo and to understand its role in the disease's progression.

Keywords – Vitiligo, Vitamin D, Serum levels, Autoimmune disorder, Melanocytes.

ORRD_28

Critical Length for Intramedullary Nailing In Extra- Articular Distal Tibial Fractures: A Biomechanical Study

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Purpose: Distal tibia fractures are complex injuries with high complication rates, including delayed union, non-union, and wound-related issues such as dehiscence and infection. Locked intramedullary (IM) nailing and plating are the two commonly employed fixation methods, but controversy remains regarding their biomechanical superiority. Additionally, there is no consensus on the minimum fracture distance from the tibial plafond suitable for IM nailing. This study evaluates the effect of distal fragment length, relative to total tibial length, on the biomechanical stability of IM nailing in distal tibia fractures.

Method: A prospective biomechanical study was conducted using synthetic tibia bone models. Four experimental groups were created based on osteotomy at 12%, 15%, 20%, and 25% of the total tibial length (standardized at 38 cm) from the distal tibial articular surface (Groups A, B, C, and D). Mechanical testing was performed using a servo-hydraulic testing machine, assessing medio-lateral (ML) and antero-posterior (AP) bending via three-point bending tests and axial stability via sinusoidal loading.

Results: Bending stiffness was consistently lower in the AP plane than in the ML plane. Group A showed significantly lower AP stiffness, a higher AP neutral zone, and a greater AP peak fracture gap angle compared to Group D, indicating marked sagittal instability. No significant differences were noted in ML bending or axial compressive testing.

Conclusion: Comminuted extra-articular distal tibial fractures with a distal fragment length of 12% of total tibial length exhibit significant sagittal plane instability. Proper assessment of fragment length is crucial when considering IM nailing.

ORRD_29

A Comparative Study of Serum Insulin Levels and Insulin Resistance in Hypothyroid Patients and Healthy Controls

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Background: Hypothyroidism, a condition characterized by reduced thyroid hormone production, significantly impacts metabolic processes. Elevated serum insulin levels and increased insulin resistance are critical contributors to metabolic complications in hypothyroid patients.
These alterations exacerbate the risk of cardiovascular diseases and other metabolic disorders, necessitating the regular assessment of serum insulin and insulin resistance for effective management.

Aim: To assess and compare serum insulin levels and insulin resistance between hypothyroid patients and age-matched healthy controls.

Methodology: An observational study was conducted on sample size 80 ; 40 hypothyroid patients attending general medicine opd and 40 controls were taken , complying with inclusion and exclusion criteria.

Result And Conclusion: Hypothyroid patients showed significantly elevated insulin levels compared to healthy controls. The mean insulin levels in hypothyroid patients was 18.5 ± 4.2μIU/mL, whereas in healthy controls was 7.3 ± 1.82μIU/mL. Insulin resistance was markedly higher i.e 4.8 ± 1.1 in hypothyroid patients and 1.2 ± 0.3 in healthy controls indicating significant metabolic alterations. Elevated TSH and reduced free T3 and free T4 levels in hypothyroid patients were strongly associated with metabolic dysfunction. This study emphasizes the significant elevation in serum insulin levels and insulin resistance in hypothyroid patients. Regular evaluation of serum insulin and insulin resistance in hypothyroid patients is crucial for mitigating metabolic risks and optimizing management strategies.

Keywords: Hypothyroidism , Insulin resistance

ORRD_30

Comparative study of serum ghrelin and lipid profile in type 2 diabetes patients and healthy controls

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Background: Type 2 Diabetes Mellitus (T2DM) is commonly associated with hormonal imbalance and lipid abnormalities. Ghrelin, a gut peptide involved in appetite and metabolism, may influence lipid levels.

Aim: To compare serum ghrelin levels and lipid profile between T2DM patients and healthy controls, and to study their correlation.

Materials and Methods: A case-control study was conducted including 39 T2DM patients and 39 healthy controls aged 35-60 years. Sociodemographic details were recorded. History and Clinical examination, laboratory equipments will be used. Fasting serum glucose, HbA1c, lipid profile, a-amylase, and lipase were measured using standard biochemical methods. Ghrelin levels were compared between groups and correlated with lipid parameters.

Results and Conclusion: T2DM patients showed higher fasting glucose and HbA1c values compared to controls. Dyslipidemia was more common in diabetic patients. Ghrelin levels showed a correlation with LDL, HDL, TG. Lower ghrelin levels inversely associate wiith dyslipidemia in T2DM patients.

Keywords: Ghrelin, Type-2 Diabetes Mellitus

ORRD_31

Correlation Of Triglyceride–Glucose (Tyg) Index With Atherogenic Plasma Indices (Aip, Ac, Castelli Indices, Non-Hdl, And Lap) In Adults Attending MYH & Associated Hospitals, Indore

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Background: Dyslipidemia and insulin resistance are highly prevalent in urban central India, including Indore, contributing substantially to rising cardiovascular disease. The Triglyceride–Glucose (TyG) index is a validated surrogate marker of insulin resistance, while atherogenic indices such as Atherogenic Index of Plasma (AIP), Atherogenic Coefficient (AC), Castelli Risk Indices (CRI-I and CRI-II), Non-HDL cholesterol, and Lipid Accumulation Product (LAP) reflect lipid-related cardiovascular risk. This study evaluates the correlation of TyG with multiple atherogenic indices in adults attending M.Y. Hospital & Associated Hospitals, Indore.

Aim: To assess the correlation of the TyG index with AIP, AC, CRI-I, CRI-II, Non-HDL cholesterol, and LAP in adults attending M.Y. Hospital & Associated Hospitals, Indore.

Methods: A cross-sectional study was conducted among 360 adults. Fasting glucose, lipid profile (TC, TG, HDL), and calculated LDL (Friedewald formula for TG < 400 mg/dL) were analyzed on the Beckman Coulter AU5800 automated analyzer. Waist circumference was measured using standardized anthropometric procedures. TyG, AIP, AC, CRI-I, CRI-II, Non-HDL, and LAP indices were calculated. Pearson correlation was used to assess associations.

Results: The mean age was 45.0 ± 12.9 years; 58% were male. TyG showed a strong correlation with AIP ($r = 0.735$, $p < 0.001$) and a moderate correlation with LAP ($r = 0.420$, $p < 0.001$). Modest associations were observed with CRI-II ($r = 0.282$, $p < 0.001$) and Non-HDL ($r = 0.210$, $p < 0.001$), while AC and CRI-I showed no significant correlation.

Conclusion: TyG strongly correlates with AIP and moderately with LAP, CRI-II and Non-HDL. These findings support the use of TyG as a simple, cost-effective metabolic marker that complements lipid-derived atherogenic indices in cardiovascular risk prediction.

Keywords: TyG index, Insulin resistance, AIP, Castelli Index, LAP, Atherogenic indices.

ORRD_33

Study of Serum Total Calcium and Serum Calcium / Phosphorus Ratio in Essential Hypertension

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Background: Essential hypertension remains a major public health burden, influenced by multiple metabolic and vascular factors. Emerging evidence suggests that disturbances in calcium and phosphorus homeostasis may contribute to altered vascular tone and blood pressure regulation. This study evaluated serum total calcium, serum phosphorus, and the calcium-phosphorus (Ca/P) ratio in essential hypertensive patients and assessed their correlation with hypertension severity.
Aim: To estimate the levels of Total Serum Calcium and Serum Phosphorus in patients with essential hypertension
Methods: A cross-sectional comparative study was conducted among 100 adults, including 50 diagnosed cases of essential hypertension and 50 age- and sex-matched normotensive controls, at MGM Medical College, Indore (May 2024–April 2025). Blood pressure was measured using JNC VIII criteria. Serum total calcium and phosphorus were estimated using Arsenazo III and ammonium molybdate methods, respectively. Statistical analysis was performed using SPSS v23, employing the t-test, Chi-square test, and Pearson correlation. A p-value of <0.05 was considered significant.
Results: Mean serum total calcium was significantly lower in hypertensive cases (8.6±0.4 mg/dL) compared to controls (9.0±0.5 mg/dL, p=0.002). Serum phosphorus levels were also reduced in cases (2.8±0.6 mg/dL) versus controls (3.4±0.3 mg/dL, p=0.003). Conversely, the Ca/P ratio was significantly higher in hypertensives (3.1±0.63) compared to controls (2.53±0.20, p=0.001). Among hypertensive patients, 70% had Stage 1 and 30% had Stage 2 disease. Serum calcium ($r = –0.32$, $p = 0.008$) and phosphorus ($r = –0.14$, $p = 0.012$) demonstrated significant negative correlations with hypertension severity, whereas the Ca/P ratio showed a strong positive correlation ($r = 0.56$, $p = 0.001$).
Conclusion: Essential hypertension is associated with significantly lower serum calcium and phosphorus levels and a markedly elevated calcium-phosphorus ratio. The Ca/P ratio exhibits the strongest correlation with hypertension severity, suggesting its utility as a simple, cost-effective biochemical marker for risk stratification and clinical assessment.

Keywords: Essential hypertension, serum calcium, serum phosphorus, Ca/P ratio.

ORRD_34

Serum ADMA as a Marker of Coronary Artery Disease: Evidence from a Case–Control Study

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Background: Asymmetric dimethylarginine (ADMA) is a naturally occurring molecule that interferes with nitric oxide production and may reflect early changes in vascular health. Its role in coronary artery disease (CAD) is still being explored.

Objectives: To compare serum ADMA levels between CAD patients and matched healthy adults and to determine whether ADMA relates to angiographic severity.

Methods: Sixty adults aged 35–60 years were enrolled, including 30 CAD patients and 30 healthy controls matched for age and sex. ADMA levels were measured using ELISA. CAD severity was classified as single-, double-, or triple-vessel disease. Statistical tests included t-test, ANOVA, and Pearson correlation.

Results: Mean ADMA levels were higher in CAD patients compared with controls (0.82 ± 0.21 vs. 0.54 ± 0.17 μmol/L, $p < 0.001$). ADMA values increased from single- to triple-vessel disease, although this rise was not statistically significant ($p = 0.08$). ADMA showed a mild positive correlation with Gensini score ($r = 0.32$, $p = 0.07$).

Conclusion: ADMA levels were clearly elevated in CAD patients and tended to rise with disease severity. Although not statistically significant, these patterns suggest that ADMA may serve as an indicator of endothelial dysfunction.

Keywords: ADMA, coronary artery disease, endothelial dysfunction, biomarker, Gensini score

ORRD_35

A comaprative analysis of vitamin B12 and vitamin B9 levels in adults with depression and their association with depression severity : An analytical cross-sectional study

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Background: Major Depressive Disorder (MDD) is a common and disabling psychiatric condition influenced by multiple biological and nutritional factors. Vitamin B12 is essential for DNA synthesis and myelin formation, while Vitamin B9 (folic acid) plays a key role in the synthesis of neurotransmitters such as serotonin, dopamine, and norepinephrine. Deficiencies in these vitamins may contribute to the development and severity of depressive symptoms.

Aim:

- To compare the serum levels of vitamin B12 and vitamin B9 in adults with and without depression.
- To find out association of vitamin B12 and vitamin B9 with severity of depression in adults.

Methodology: This analytical cross-sectional study included adults diagnosed with MDD according to DSM-5 criteria attending the Psychiatry OPD and inpatient wards of a tertiary care center. A control group without depression was selected based on inclusion and exclusion criteria. Clinical evaluation was conducted using DSM-5 diagnostic criteria, Hamilton Depression Rating Scale (HAM-D-17), and Patient Health Questionnaire-9 (PHQ-9). Serum Vitamin B12 and Vitamin B9 levels were measured using standard laboratory methods.

Results: The study demonstrated a statistically significant association between reduced serum levels of Vitamin B12 and Vitamin B9 and the presence of depression. Additionally, lower levels of both vitamins were significantly correlated with increased severity of depressive symptoms.

Conclusion: Vitamin B12 and Vitamin B9 deficiencies are significantly associated with depression and its severity, highlighting the potential role of nutritional factors in the pathophysiology and clinical management of Major Depressive Disorder.

Keywords: Depression, Major depressive disorder, Vitamin B12, Vitamin B9

RESEARCH SCHOLARS

ORRS_01

Investigating the Impact of Essential Minerals on Anaemia in Pregnant Women of Eastern Uttar Pradesh

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Background: Essential mineral deficiencies affect all age groups, but pregnant women and children are especially vulnerable. Pregnancy increases metabolic demands, requiring adequate nutrients for placental, fetal, and maternal development, yet in low-resource settings these needs are often unmet.

Aim: This study assessed essential minerals; copper, zinc, selenium, iron, manganese, magnesium, molybdenum, cobalt, and calcium and their correlation with anemia severity.

Methodology: Total 599 pregnant women (323 anaemic, 276 non-anaemic). Anaemia severity was classified using WHO guidelines, and mineral levels were measured by inductively coupled plasma mass spectrometry.

Result: Gestational age was significantly lower in anaemic women (29.27 ± 3.76 weeks) compared to non-anaemic (29.93 ± 4.19 weeks; $p = 0.042$). Serum concentrations of copper (1799.0 ± 933.11 vs. 2125.10 ± 1245.67 µg/L; $p = 0.0003$), zinc (557.98 ± 482.84 vs. 704.07 ± 438.06 µg/L; $p = 0.0001$), selenium (148.57 ± 71.52 vs. 169.97 ± 118.88 µg/L; $p = 0.006$), iron (70.64 ± 52.69 vs. 113.72 ± 101.19 µg/dL; $p < 0.0001$), manganese (2.54 ± 1.55 vs. 4.36 ± 2.54 µg/L; $p < 0.0001$), magnesium (1.96 ± 0.54 vs. 2.08 ± 0.36 mg/dL; $p = 0.001$), molybdenum (0.97 ± 0.53 vs. 1.92 ± 1.73 µg/L; $p < 0.0001$), and cobalt (0.85 ± 1.97 vs. 3.03 ± 0.49 µg/L; $p < 0.0001$) were all significantly lower in the anaemic group. Mean mineral levels declined with increasing anaemia severity. Haemoglobin correlated positively with copper ($r = 0.219$), zinc ($r = 0.133$), selenium ($r = 0.289$), iron ($r = 0.180$), manganese ($r = 0.150$), cobalt ($r = 0.268$), and calcium ($r = 0.252$) (all $p < 0.05$).

Conclusion: These findings demonstrate that deficiencies in multiple trace elements impair hematopoiesis, contributing to anaemia and maternal–fetal risks. Early detection and targeted supplementation of essential minerals are critical to reducing anaemia and improving pregnancy outcomes.

Keywords: Essential minerals, Anemia, Pregnancy, ICPMS, Nutritional deficiencies

ORRS_02

Temporal Dynamics of Red Cell Distribution Width (RDW) and C-Reactive Protein (CRP) Across the Menstrual Cycle in Young Healthy Females

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Introduction: Menstruation is a normal process in fertile women, comprising three phases: Follicular, Ovulatory ,Luteal phases. Red Cell Distribution Width (RDW) and C-Reactive Protein (CRP) are increasingly recognized biomarkers of hematological variability and low-grade inflammation. However, their physiological fluctuations across the menstrual cycle remain poorly understood, leading to potential misinterpretation of laboratory values in reproductive-age women. This study examines the impact of menstrual cycle phases on RDW and CRP dynamics in young females.

Methodology: This study was conducted at Uttar Pradesh University of Medical Sciences involving 50 females aged 18 to 30 with regular menstrual cycles (28 ± 3 days). Ethical approval and informed consent were obtained. Blood samples (2 ml) were taken during three cycle phases: days 3-5 (Follicular), around day 14 (Ovulatory), and days 20-24 (Luteal). Red cell distribution width (RDW) and C-reactive protein (CRP) levels were measured using automated analyzers.

Results: RDW demonstrated a **significant rising trend** from the follicular to the luteal phase. In contrast, CRP **did not exhibit any consistent rising or falling pattern** across phases, and differences were **not statistically significant.** No correlation was found between RDW and CRP in any phase.

Conclusion: RDW shows clear temporal variation across the menstrual cycle, whereas CRP remains physiologically stable in healthy women. These findings suggest that RDW is a more sensitive biomarker for cycle-related hematological changes, while CRP is less influenced by menstrual physiology. Understanding these dynamics may improve interpretation of laboratory results in reproductive-age females.

Keywords: Menstrual Cycle Phases, Red Cell Distribution Width (RDW), C-Reactive Protein Biomarkers (CRP)

ORRS_03

DNA methylation as a prognostic factor in non-muscle-invasive bladder cancer: A systematic review and meta-analysis

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Background: Non–muscle-invasive bladder cancer (NMIBC) is characterized by high rates of recurrence and progression, making precise risk stratification a major clinical challenge. Epigenetic alterations viz. promoter DNA methylation leading to the silencing of tumor-suppressor genes, have been investigated as promising prognostic biomarkers; however, findings across studies have remained inconsistent. **Aim:** To determine whether DNA methylation can serve as a reliable biomarker for patient stratification and clinical decision-making in the management of NMIBC. **Methods:** A systematic search was conducted across major databases (PubMed, Embase, Web of Science, MEDLINE, and the Cochrane Library) for studies evaluating the prognostic value of DNA methylation in NMIBC patients (2010–2022). Following PRISMA guidelines, eleven studies comprising 3,065 NMIBC patients met the eligibility criteria. Hazard ratios (HRs) for progression-free survival (PFS), recurrence-free survival (RFS), and overall survival (OS) were pooled using random-effects models. Subgroup analyses were performed based on molecular pathways and geographic region. **Results:** Promoter methylation was significantly associated with poor progression-free survival (pooled HR=2.88; 95% CI=2.03–4.09; p<0.0001) and recurrence-free survival (pooled HR=2.65; 95%CI=1.93–3.63; p<0.0001). Although overall survival showed pathway-specific variation (pooled HR=0.96; 95% CI=0.36–2.60; p=0.94), methylation of adhesion and apoptosis-related genes demonstrated the strongest associations. Subgroup analyses indicated a greater prognostic impact in Asian cohorts (p<0.0001), suggesting regional differences in epigenetic susceptibility. **Conclusion:** DNA promoter methylation is a strong and consistent prognostic biomarker for recurrence and progression in NMIBC, with better effects in the Asian populations. Standardization of validated gene panels, assay thresholds, and cross-regional prospective validation will be essential for clinical translation. Integrating methylation-based classifiers into risk stratification models could improve individualized management and long-term outcomes in NMIBC.

Keywords: DNA methylation, NMIBC, Biomarker, Recurrence, Prognosis, Progression, Epigenetic markers

ABSTRACTS
POSTER
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POFA_01

Maternal Vitamin B12 and Perinatal Outcomes: An Observational Correlation Analysis

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Background: Vitamin B12 plays a vital role in maternal and fetal health, influencing neurological development, hematopoiesis, and pregnancy outcomes. However, the relationship between maternal Vitamin B12 status and neonatal outcomes remains inconclusive.

Methods: This study assessed the correlation between maternal Vitamin B12 levels and various neonatal and maternal parameters among 90 pregnant females during third trimester. Data were analyzed using Pearson's correlation coefficient, and $p < 0.05$ was considered statistically significant.

Results: Maternal Vitamin B12 levels showed no significant correlation with baby weight ($r = –0.097$, $p = 0.40$), APGAR score at 1 minute ($r = –0.027$, $p = 0.817$) and 5 minutes ($r = –0.025$, $p = 0.830$), fetal maturity ($r = –0.060$, $p = 0.605$), live or stillbirth status ($r = 0.036$, $p = 0.755$), resuscitation requirement ($r = 0.062$, $p = 0.593$), mode of delivery ($r = 0.045$, $p = 0.702$), congenital anomalies ($r = –0.090$, $p = 0.436$), or maternal hemoglobin ($r = 0.087$, $p = 0.677$).

Conclusion: No statistically significant association was found between maternal Vitamin B12 levels and neonatal outcomes or maternal hemoglobin in this cohort. Larger, multi-center studies are required to clarify the role of Vitamin B12 in perinatal outcomes.

POFA_02

Clinical Evaluation of Chromium and Magnesium in patients with development of Type 2 Diabetes Mellitus.

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Diabetes mellitus is a metabolic disease, leading inappropriately elevation in the blood glucose level. Type 2 diabetes mellitus is one of the most common forms of diabetes consisting 90% of the population worldwide. India gained the highest distinction of being the diabetes capital of the world. It is a chronic disorder of glucose homeostasis associated with insulin deficiency or/and resistance to the action of insulin. It is caused by the several factors such as aging, lifestyle, obesity and no physical activity leading to insulin resistance. Various metals are required for smooth functioning of many enzymes, protein, transcriptional factor and many other biochemical assays. Deficiency of Chromium leads to insulin impairment and diabetes. Providing individuals with chromium supplements will increase the chromium levels and might be decreasing the fasting glucose levels in the individuals. Magnesium deficiency is also inter-linked with insulin resistance, which is the core reason for the development of type 2 diabetes mellitus. By consuming Magnesium supplements, the level of magnesium gets increased in blood and also improves blood glucose level. Therefore, it is being required for more study in these nutritional supplements to the diabetic individuals in order to prevent diabetes. In the present study, 100 patients newly diagnosed with Type 2 Diabetes Mellitus will be included with oral administration of Chromium and Magnesium supplements and randomized into two subgroups. The patients will be assed clinically and biochemically after 12week or a pre-defined period of time. These supplements might be effectively showing a significant change in blood glucose level, HbA1c, serum insulin and C-peptide.

POFA_03

Effect of Endotrophin on Endothelial Lipid Metabolism

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Background: Coronary artery disease is a well-established co-morbidity associated with obesity. Endotrophin, an adipokine derived from adipose tissue collagen, has been hypothesized to be incriminated in deleterious lipid metabolism in obesity, and thus could play a vital role in atherosclerotic plaque development, but no conclusive evidence is available so far. This study aims to evaluate the effect of endotrophin on lipid handling in human umbilical vein endothelial cell line (HUVEC).

Methods: Morbidly obese subjects (BMI ≥ 40; n=25) aged 18-60 years undergoing bariatric surgery and their age matched controls (BMI < 25; n=25) were included. Serum endotrophin in both groups was estimated using ELISA based kit assays. Recombinant human endotrophin was cloned and used to treat HUVEC cultures. After treatment, HUVECs were analyzed for mRNA expression of VLDLR, LPL, FABP and HSL. Results were analyzed statistically by Student's t-test, and were also correlated with anthropometric parameters and lipid profile.

Results: Preoperative circulating levels of endotrophin were significantly higher in obese as compared to non-obese individuals ($p<0.001$***), and reduced significantly after bariatric surgery ($p<0.001$***). It also correlated significantly with BMI and lipid profile ($p<0.01$**). HUVECs grown in presence of endotrophin exhibited significantly different expression profile for the selected genes ($p<0.5$* for all).

Conclusions: Endotrophin correlates with a deranged lipid profile, and affects the lipid handling in endothelial cells. It could be a key player in development of atherosclerosis and coronary artery disease in morbidly obese individuals.

POFA_04

The Association of Toxic Elements in Pathogenesis of Hypertensive Disorders of Pregnancy

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Background: Hypertensive disorders of pregnancy (HDP) affects approximately 10% of pregnancies globally. HDP are a leading cause of maternal and fetal morbidity and mortality, with emerging evidence indicating that imbalances in trace elements may play a role in their pathogenesis.

Aim: To evaluate the association of trace elements **(**copper, selenium, molybdenum, manganese, and cobalt) with HDP.

Methodology: This case-control study included 190 patients diagnosed with hypertensive disorders of pregnancy (HDP)(cases) and 190 healthy pregnant women (controls)from Uttar Pradesh, North India. Serum levels of essential TEs (Cu, Se, Mo, Mn, and Co) were estimated using NexION 1000 ICP-MS in helium collision mode. The estimation of sFlt-1 (soluble fms-like tyrosine kinase-1) and PlGF (placental growth factor) on the cobas 6000 analyzer Roche diagnostics using commercially available kits from the same manufacturer, based on Electrochemiluminescence Immunoassay (ECLIA) technology.

Results: Higher Cu levels were associated with an increased risk of HDP. Compared to quartile 1(Q1: 71.17–2311.05 µg/L), quartile 4 (Q4:3739.4–8974.2 µg/L) had higher Odd's of HDP (3.33, 95% CI:1.86-5.97, p<0.001). Lower Mo levels were strongly associated with an increased risk of HDP, whereas higher levels appeared to be protective. Compared to the highest quartile (Q4:4.25–26.62 µg/L, reference), quartile 3 (Q3:2.36–4.21 µg/L) showed no significant difference in risk (OR = 1.75, 95% CI: 0.51–5.93, $p = 0.544$). The sFLT-1 (877.19 vs. 580.20 pg/mL, p=0.021) and SPR (116.61 vs. 52.13, p=0.043) were significantly higher in HDP cases than the controls. However, PlGF (116.61 vs. 52.13 pg/mL, p=0.035) was significantly reduced in HDP cases than the controls. HDP cases had higher copper (3180.89 vs. 2977.21 µg/L, $p < 0.001$) but lower selenium (122.93 vs. 133.87 µg/L, $p = 0.031$), molybdenum (1.50 vs. 2.00 µg/L, $p = 0.016$), and cobalt (0.66 vs. 1.18 µg/L, $p < 0.001$) compared to controls. Mn levels were not significantly different between the groups (p = 0.094)

Conclusion: Toxic elements do disrupt the angiogenic balance in pregnancy and hence, have strong association with hypertensive disorders of pregnancy.

Keywords: Hypertensive disorders of pregnancy (HDP), Toxic elements, angiogenic biomarkers, sFlt/PlGF ratio, Preclampsia

POFA_05

Prevalence of hypothyroidism in macroprolactinemia

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Background: Hyperprolactinemia is common in subjects with hypothyroidism. Prevalence of macroprolactinemia in hypothyroid people is unknown. Macroprolactin consists of monomeric prolactin complexed with immunoglobulins (IgA and IgG).

Objective: To determine the prevalence of hypothyroidism in subjects with macroprolactinemia.

Method: In this cross-sectional study, 330 patients of hyperprolactinemia(>25ng/ml) were assessed for macroprolactinemia. We performed polyethylene glycol (PEG) precipitation test for macroprolactinemia screening. Prolactin,FreeT4 and TSH levels were measured by enhanced chemiluminescent immunoassay(eCLIA)(Vitros Eci,Orthoclinical Diagnostics, USA).

Results: Total 47(14.2%) males and 283(85.8%) females with mean age ± SD(30.08±8.8) and (29.94±8.65) respectively were included in the study.Out of 330 patients 32 patients(9.6%) were true positive for macroprolactin,105 patients(31.8%) and 193 patients(58.48%) were borderline positive for macroprolactin and negative for macroprolactinemia respectively.21 females(8 females true positive and 13 borderline positive) and 1 male(borderline positive) had hypothyroidism with macroprolactinemia.Prevalence of positive macroprolactinemia cases was 16.33% in women with hypothyroidism(p=0.432),Prevalence of hypothyroidism in cases with Macroprolactinemia positive(recovery <40%) was 25%,Prevalence of hypothyroidism in patients borderline positive(recovery 40%-60%) for macroprolactinemia was 13.46% and prevalence of hypothyroidism in patients who were negative for macroprolactinemia(recovery >60%) was 13.92%.

Conclusion: Prevalence of hypothyroidism in macroprolactin positive patients is significantly higher compared to patients with borderline macroprolactin positive and patients negative for macroprolactin. Screening of hypothyroidism should be done in patients with macroprolactinemia.

Key words: Macroprolactinemia, Hypothyroidism, Prevalence

POFA_06

Characterization of Genetic Pathways Involved in Biofilm Formation in Methicillin-Resistant and Methicillin-Sensitive *Staphylococcus aureus* (MRSA and MSSA) Isolates

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Biofilm formation in *Staphylococcus aureus*, particularly in multidrug-resistant (MDR) strains, contributes significantly to chronic infections and antibiotic tolerance. This study investigated the nature of intercellular adhesion in MSSA and MRSA biofilms, focusing on polysaccharide intercellular adhesin (PIA)-dependent and fibronectin-binding protein A (FnBPA)-dependent pathways.

The objective was to characterize the icaA-D and FnBPA genes responsible for biofilm formation in MDR MSSA and MRSA isolates. Primers for icaA, icaD, and FnBPA were synthesized, and PCR was performed, amplification products were resolved, stained, and visualized using the DNR MiniBis Pro Bio-Imaging System. Gene presence was expressed as positive or negative.

A total of fifty-two isolates obtained from patients with device-related infections were analyzed, including 36 MRSA and 16 MSSA strains. All MRSA isolates showed resistance to penicillin, cefoxitin, tetracycline, doxycycline, clindamycin, and erythromycin, but remained susceptible to vancomycin, linezolid, and chloramphenicol. Biofilm-producing samples were separated from non-biofilm producers.

Biofilm synthesis is primarily driven by the ica operon, with icaA and icaD as key components. Among the 36 MRSA isolates, 11.1% possessed icaA, 22.2% had icaD, and 11% carried both genes, indicating a minority equipped for robust PIA-mediated biofilm formation. Isolates with both genes are likely proficient in PIA matrix production, enhancing infection chronicity. Partial operons (e.g., icaD alone) may confer reduced biofilm efficacy. These findings highlight the genetic variability in biofilm pathways among MDR *S. aureus* isolates, with implications for targeted therapeutic strategies against device-related infections.

Keywords: MRSA, MSSA, Antimicrobial resistance, Biofilm, Resistance genes, Device-related infections

POFA_07

Accidental Diagnosis of Homozygous Sickle Cell Anemia Co-Inherited with α-Thalassemia in a 70-Year-Old Female: Pedigree and Family Screening

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Background: Sickle cell anemia (HbSS) usually presents early in life with significant morbidity and reduced survival. Genetic modifiers like α-thalassemia may attenuate disease severity. Hemoglobin variant "windows" on HbA1c high-performance liquid chromatography (HPLC) can unmask underlying hemoglobinopathies.

Case Report: We present a 70-year-old woman undergoing routine health screening. HbA1c by HPLC showed absence of HbA peak and presence of an "S-window." Further testing with capillary electrophoresis and genetic analysis confirmed homozygous HbSS with co-inherited heterozygous α-thalassemia. Remarkably, the patient was asymptomatic until diagnosis. Hemoglobin electrophoresis revealed HbS 63.7%, HbF 35.3%, and HbA2 1%. Family screening identified sickle cell trait (HbAS) in her son, daughter, brother, and brother's grandson.

Discussion: This rare late-age diagnosis highlights how α-thalassemia may ameliorate HbSS severity, contributing to prolonged survival. Abnormal HbA1c "variant windows" should always prompt confirmatory evaluation for hemoglobinopathies. Family-based screening is critical for genetic counseling and preventive strategies.

Conclusion: Co-inheritance of α-thalassemia can significantly modify the phenotype of HbSS, enabling survival beyond the typical age. HbA1c variant detection serves as a valuable diagnostic clue, underscoring the importance of comprehensive laboratory evaluation and family counseling.

Keywords: Sickle cell anemia, α-thalassemia, HbA1c variant, family screening, pedigree

RESIDENTS

PORD_01

A comparative study between intraperitoneal instillation of bupivacaine and bupivacaine with dexmedetomidine for post operative analgesia in laparoscopic cholecystectomy

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Background: The study seeks to evaluate and compare the analgesic effects of bupivacaine infiltration alone and Bupivacaine infiltration with dexmedetomidine in patients undergoing laparoscopic cholecystectomy.

Methods: A total number of 60 patients of either sex undergoing elective laparoscopic cholecystectomy surgery were randomly divided into 2 groups of 30 patients each. Group A received intraperitoneal instillation with 40ml of 0.25% bupivacaine alone and Group B received intraperitoneal instillation with 40ml of 0.25% bupivacaine plus dexmedetomidine 1mcg/kg. Severity of post operative pain was assessed using NRS at 2,4,8,12,18 & 24 hours. The requirement of rescue analgesics was recorded.

Result: VAS at different time interval when compared in both groups bupivacaine + dexmedetomidine group had less vas score throughout. There was significant difference in the VAS score between bupivacaine and bupivacaine +dexmedetomidine(B+D) group with p value less than 0.05 during first 6 hours.

Conclusion: Based on the findings of this study, intraperitoneal infiltration of bupivacaine plus dexmedetomidine has reduce post operative pain better, reduction in rescue analgesia and with well-maintained haemodynamic postoperatively and superior satisfaction.

Keywords: bupivacaine hydrochloride, dexmedetomidine hydrochloride, intraperitoneal injection, pain, post-operative.

PORD_02
To assess the association between generalized anxiety disorder and thyroid profile status in Datia district of central India

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Background: To investigate the Thyroid hormone profile among patients diagnosed with Generalized Anxiety Disorder.

Introduction: Generalized Anxiety Disorder (GAD) is a prevalent and debilitating psychiatric condition. Clinically, a significant overlap exists between the somatic symptoms of GAD e.g., restlessness, fatigue, palpitations, difficulty concentrating and the symptoms of thyroid dysfunction. Existing research indicates that deranged thyroid profile is frequently associated with anxiety and mood disorders. There is no such kind of study in Central India, especially in Gwalior Region.

Methodology: A descriptive cross-sectional study of 32 patients (10 males, 22 females; age range: 18-65 years) newly diagnosed with Generalized Anxiety Disorder in a psychiatry outpatient department were screened for thyroid hormone profile. The screening utilized serum free triiodothyronine (FT3), free thyroxine (FT4), and thyroid stimulating hormone (TSH) levels. The reference cut-off values used were FT3: 2.5–3.9 pg/mL, FT4: 0.61–1.12 ng/dL, and TSH: 0.38–5.33 μIU/mL.

Results: In total, 9 out of 32 patients (28.1%) were found to have Subclinical Hypothyroidism (defined as elevated TSH with a normal FT4 level). The remaining 23 patients (71.9%) were Euthyroid (all hormones within normal range). The prevalence of thyroid dysfunction in this study is 28.1%, which is predominantly seen in females. A large cohort study (Bathla et al., 2016) found the prevalence of anxiety symptoms in patients with hypothyroidism (including subclinical forms) to be as high as 30–63%, with women generally exhibiting higher rates than men.

Conclusion: The results from this study demonstrate a high prevalence (28.1%) of thyroid dysfunction, specifically Subclinical Hypothyroidism. This finding underscores the important clinical association between anxiety and thyroid function. It suggests that routine screening of the thyroid hormone panel in patients presenting with GAD is a valuable diagnostic step. Future, larger-scale studies are warranted to clarify causality and guide integrated management strategies in psychiatry and endocrinology.

PORD_03

A cross-sectional assessment of Dyslipidemia among patients with allergic rhinitis at SMS Medical College, Jaipur, Rajasthan

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Background: Allergic rhinitis (AR) is a widespread chronic condition affecting approximately 10% to 20% of the global population, marked by inflammation of the nasal mucosa triggered by exposure to allergens. It has a substantial impact on quality of life, often disrupting sleep and reducing work productivity. Dyslipidemia, characterized by abnormal levels of serum lipids, has been linked to several allergic disorders, including AR. This study aims to analyze serum lipid profiles—total cholesterol, HDL-C, LDL-C, and triglycerides—in individuals with allergic rhinitis, determine the prevalence of dyslipidemia within this group, and explore the relationship between serum lipid levels and specific risk factors identified through skin prick testing (SPT).

Method: A cross-sectional study was carried out in the Department of ENT at the institute, enrolling 100 patients diagnosed with allergic rhinitis according to predefined inclusion and exclusion criteria. Blood samples were collected from each participant to assess serum lipid levels, and skin prick testing (SPT) was performed to identify specific allergen sensitivities. Based on standard guidelines, patients were classified into two groups: those with dyslipidemia and those with normal lipid levels.

Results: The mean serum lipid levels among patients with allergic rhinitis (AR) were as follows: total cholesterol at 210.5 ± 30.2 mg/dL, HDL-C at 40.10 ± 5.1 mg/dL, LDL-C at 140.1 ± 25.3 mg/dL, and triglycerides at 170.4 ± 40.5 mg/dL. Dyslipidemia was observed in 58% of the participants, defined by triglyceride levels above 150 mg/dL and/or total cholesterol levels exceeding 200 mg/dL. A significant association was identified between dyslipidemia and certain allergens detected through skin prick testing (SPT), particularly hay dust (81%) and mixed mites (73%), both showing statistically significant correlations ($p < 0.001$). Other allergens exhibited varied prevalence across the dyslipidemic and normal lipid profile groups.

Conclusion: The findings reveal a notable prevalence of dyslipidemia among individuals with allergic rhinitis, with certain allergens showing a significant association with abnormal lipid profiles. These results highlight the importance of routine lipid monitoring in patients with allergic rhinitis and suggest a potential link between allergen exposure and the development of dyslipidemia.

Keywords: Allergic rhinitis, dyslipidemia, serum lipids, skin prick test, risk factors, prevalence.

PORD_04

Lipid Peroxidation and Its Association with Metabolic Syndrome: A Study of MDA Level, Plasma Glucose in Metabolic Syndrome Patients

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Background: The aim of our study was to determine the significance of plasma MDA levels in patients with metabolic syndrome and compared to healthy controls with evaluate their correlation with plasma glucose.
Methods: A cross-sectional observational study was conducted on patients attending the outpatient department of Medicine of tertiary care hospital. A total number of 60 participants (metabolic syndrome cases and age-matched controls, defined as per NCEP-ATP III criteria) which includes the presence of at least three of the following: Waist circumference ≥102 cm in men or ≥88 cm in women, Triglycerides ≥150 mg/dL, HDL cholesterol <40 mg/dL in men or <50 mg/dL in women, Blood pressure ≥130/85 mmHg or on antihypertensive treatment, Fasting blood glucose ≥100 mg/dL or on antidiabetic treatment. 30 cases and 30 controls in the age group 15-75 years were selected randomly. 5ml of venous blood was collected in sterile tubes from all 60 subjects and were analysed Anthropometric data, blood pressure, fasting glucose measured. Plasma MDA levels estimated using a specific colorimetric assay kit as following the manufacturers instruction. Statistical analysis was using SPSS version 26.0. The student t-test used for the statistical evaluation and the Pearson's Coefficient is used for the correlation between two variables.
Results: The degree of lipid peroxidation was measured by plasma levels of malondialdehyde (MDA). In this study we observed that the level of systolic and diastolic blood pressure, fasting blood sugars, triglycerides significantly elevated and HDL-C level significantly low in metabolic syndrome patients when compared to healthy controls. The plasma MDA levels significantly elevated and correlated positively with plasma glucose, hypertension, waist circumference, triglycerides and negatively with HDL-C.
Conclusion: We conclude the early detection of people at risk for getting metabolic syndrome can be improved by measuring the MDA biomarker.
Keywords: Metabolic syndrome, oxidative stress, lipid peroxidation, malondialdehyde, MDA, HDL-C, SBP, DBP, waist circumference, Triglycerides.

PORD_05

An observational study of triglyceride-glucose index and glycated hemoglobin in type 2 diabetes mellitus patients at SMS Medical College and Hospital, Jaipur, Rajasthan

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Background: Diabetes mellitus now a days emerged as a significant global health challenge, with Type 2 Diabetes Mellitus (T2DM) being the most prevalent form, accounting for approximately 90% of all diabetes cases. This predominance is primarily due to a decreased sensitivity of target tissues to insulin.According to the International Diabetes Federation, the global prevalence of diabetes in 2019 was 9.3%, translating to around 463 million individuals affected worldwide.In India, over 62 million individuals were diagnosed with diabetes.Elevated TG levels are a significant risk factor for cardiovascular disease and metabolic syndrome, measuring the product of TG and glucose as the TyG index provides a
ual indicator of glycaemic control and complications of diabetes. Therefore, this study aims to investigate the association of the TyG index with HbA1c and insulin resistance in T2DM patients. Despite their utility, HbA1c and HOMA-IR assessments are often expensive, time- consuming and not readily available in many laboratories. Consequently, there is a need of simple and cost-effective marker that can reliably identify both glycaemic control and insulin resistance. This has led to the exploration of various surrogate indicators to assess glycaemic control in diabetic patients effectively. Recently indexes such as Triglyceride-Glucose (TyG) index and Body Mass Index (BMI) have shown promise as surrogate markers for insulin resistance assessment

Methods: This is a hospital based cross sectional observational study. This study was conducted on 40 Diabetes mellitus type 2 and healthy controls attending OPD of Department of General medicine at SMS Hospital Jaipur (rajasthan). Serum Fasting Blood Sugar,Serum Triglyceride and Glycated Hemoglobin level were evaluated along Routine Biochemistry and CBC.

Results: The current study shows a higher level of Triglyceride Glucose Index and higher level of Glycated Hemoglobin in Higher disease activity (poor control) of Diabetes Mellitus. Conclusion: Our Study shows association of Triglyceride Glucose Index with Glycated Hemoglobin in Type 2 Diabetes Mellitus patients and healthy Controls. Thus, Triglyceride Glucose Index may be a useful marker to assess the control of blood Glucose (severity of disease) in Diabetes Mellitus patients.

Keywords: Serum Fasting blood sugar,Serum Triglyceride,Glycated Hemoglobin, Diabetes Mellitus Type 2, Triglyceride Glucose Index.

PORD_06

A comparative study of serum uric acid and creatinine ratio in chronic obstructive pulmonary disease patients and healthy controls.

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Background: Chronic Obstructive Pulmonary Disease (COPD) is a heterogeneous lung disorder that is characterized by chronic respiratory symptoms (such as dyspnea, cough, sputum production, exacerbation) due to abnormalities of the airways and/or alveoli that cause persistent, often progressive airflow obstruction. COPD is significant cause of morbidity and mortality throughout the world.

Method: This was a prospetive case control observational study. This study was conducted on 20 patients (case) of Chronic Obstructive Pulmonary Disease and 20 Healthy Controls attending OPD of Department of respiratory medicine attached to Sawai man singh hospital Jaipur (rajasthan). Serum Uric acid and Creatinine were evaluated along Routine Biochemistry and CBC.

Results: Both Serum Uric Acid level and uric acid to creatinine Ratio increased with increase in the severity of airflow obstruction in Chronic Obstructive Pulmonary Disease patients comparative to Healthy Controls.

Conclusion: Our Study showed significant increase in Uric acid and Serum Uric acid to Creatinine ratio in Chronic Obstructive Pulmonary Disease Patient comparative to Healthy controls.
Thus, serum Uric acid/Creatinine ratio can be a useful marker to monitor the disease severity in addition to spirometric parameters like FVC, FEV1 and FEV1/FVC.

Keywords: Serum Uric acid, Uric acid/Creatinine ratio, Chronic Obstructive Pulmonary Disease (COPD)

PORD_07

Determine the level of Serum Cortisol and Blood Glucose in patients of Depression in Central India

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Aim: To assess the serum Cortisol and Random Blood Sugar status of patients diagnosed with depression attending the Psychiatry OPD of Medical College Hospital of Datia District.
Background: Depression is a significant health concern, and its association to endocrine and metabolic dysregulation is well-documented. Dysfunction of the hypothalamic-pituitary-adrenal (HPA) axis, often presenting as hypercortisolism, is a common biological finding in depression. This can, in turn, disrupt glucose metabolism, increasing the risk for metabolic syndrome and type 2 diabetes. There is no such kind of study in central India, specifically in Gwalior region.
Methods: This was a cross-sectional, descriptive study involving 32 patients diagnosed with depression at the Psychiatry OPD, District Hospital, Datia. Blood samples were collected to analyze serum cortisol (µg/dL) and random blood glucose (mg/dL) levels. Descriptive statistics, Pearson correlation, and independent t-tests were used to analyze the data, assess the relationship between cortisol and glucose.
Results: The study group (n=32) 22 females and 10 males, age group 18-75 years, and was predominantly females (68.8%). The mean serum cortisol level was found to be 18.63 µg/dL, which is at the upper limit of the normal morning reference range. The mean random blood glucose level was 122.25 mg/dL, which is in the high-normal range. A weak, non-statistically significant positive correlation was observed between serum cortisol and glucose levels ($r = 0.265$, $p = 0.130$). No significant differences were found in cortisol or glucose levels between male and female patients.
Conclusion: The findings suggest a trend of elevated cortisol and high-normal glucose levels in these patients, consistent with the established literature associating depression to HPA axis over activity and subsequent metabolic stress. These findings suggest that elevated cortisol indicating state of chronic stress, and the high-normal glucose indicating potential insulin resistance or a pre-diabetic state. This highlights the need for routine metabolic screening in patients with depression. The lack of a significant correlation is likely due to the small sample size and non-standardized (random) sampling

PORD_08

Association of hs-CRP, Serum Ferritin and Lipoprotein(A) With Type 2 Diabetes Mellitus

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Background: Type 2 Diabetes Mellitus (T2DM) is a major global health challenge characterized by insulin resistance and hyperglycemia. Increasing evidence suggests that inflammation plays a critical role in its pathogenesis. Among various biomarkers, high-sensitivity C-reactive protein (hs-CRP), serum ferritin, and lipoprotein(a) [Lp(a)] have been implicated in both the onset and complications of T2DM.

Aim: To evaluate the association of hs-CRP, serum ferritin, and Lp(a) with T2DM, and to explore their potential as markers of disease activity and cardiovascular risk.

Methodology: This case-control study will include 180 participants: 90 newly diagnosed T2DM patients (aged 30–50 years) and 90 age-matched healthy controls. Venous blood samples will be analyzed for hs-CRP (turbidimetric immunoassay), serum ferritin (Erba semi-auto analyzer), and Lp(a) (immunoassay). Statistical analysis will be performed using SPSS, with independent t-tests applied for group comparisons.

Result and Conclusion: In the present study, all evaluated biomarkers—hs-CRP, serum ferritin, and Lp(a)—were found to be significantly increased in patients with T2DM when compared to non-diabetic controls.

Elevated hs-CRP and serum ferritin levels indicate the presence of systemic inflammation and a higher degree of insulin resistance. Similarly, increased Lp(a) concentrations reflect a greater cardiovascular risk burden in T2DM individuals.

Keywords: Type 2 Diabetes Mellitus, hs-CRP, Serum Ferritin, Lipoprotein(a), Inflammation, Cardiovascular Risk

PORD_09

FEV1/FVC Ratio as a screening tool for COPD Patients in Datia

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Aim: To evaluate the diagnostic accuracy of the FEV1/FVC ratio as a screening tool for Chronic obstructive lung disease (COPD) patients in Datia district.

Methodology: A hospital-based cross-sectional observational study was conducted among 40 subjects (30 COPD and 10 non-COPD) attending Pulmonary Medicine OPD in Government Medical College and associated hospital, Datia (MP) after due ethical approval from IEC, GMC Datia. Spirometry was performed according to American Thoracic Society/European Respiratory Society guidelines (ATS/ERS) using a spirometer pod and labchart 8 software. Inclusion criteria for COPD were defined by a post-bronchodilator FEV1/FVC ratio of less than 0.70 as per Global Initiative for Chronic Obstructive Lung Disease (GOLD) criteria. Demographic data, smoking status, and spirometric parameters were recorded. Statistical analysis was performed using SPSS version 21 software, with results expressed as mean ±SD, percentages, and frequencies. Diagnostic accuracy was assessed by calculating sensitivity, specificity, positive and negative predictive values (PPV & NPV).

Result: Mean FEV1/FVC ratio recorded was 0.55±0.07 in COPD patients and 0.78±0.05 in non-COPD subjects ($p < 0.001$). Using a cutoff of <0.70, the sensitivity was 100%, specificity 90%, PPV 95.2%, NPV 100%, and overall diagnostic accuracy 96.7%.

Conclusion: The FEV1/FVC ratio is a simple, reliable, and cost-effective diagnostic marker for COPD detection. Its high sensitivity and diagnostic accuracy support its continued use for early diagnosis of COPD in underdeveloped tertiary healthcare settings like Datia.

PORD_10

Evaluation of Oxidative Stress marker & Dyslipidaemia in Type 2 Diabetes Mellitus patients: A Case control study

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Introduction: Diabetes is characterized by chronic hyperglycaemia & disturbances of carbohydrate, lipid and protein metabolism. In subtypes of Diabetes Mellitus, type II diabetes mellitus is the most common endocrine and metabolic disorder. DM is a condition of increased oxidative stress and requires antioxidant.

Aim: To assess the association between of oxidative stress and lipid abnormalities in type 2 diabetes mellitus patients in comparison with healthy subjects.

Materials & Method: This is a case control study, A total of 90 cases of type II diabetes mellitus & 90 cases of healthy subjects between the age of 30 and 60 years were enrolled in study. Fasting blood glucose, glycated haemoglobin (HbA1c), total cholesterol (TC), Triglycerides (TG), high density lipid (HDL) and malondialdehyde (MDA) levels were assessed.

Results: The mean age of type II diabetes mellitus cases were higher 55.2±10.1yr and 45±14 yrs in healthy subjects. The body mass index was higher 29.7±3.8 kg/m2 and 24.8±5.3 in healthy controls. Significant difference was observed in FBS, Hb1Ac, TC, TG, LDL, HDL along with VLDL & MDA. With TC, LDL, VLDL, FBS, HbA1c shows positive correlation between MDA and HDL.

Conclusion: Increased blood glucose levels along with dyslipidaemia in patients with diabetes causes oxidative stress leading to atherosclerosis. Early detection and treatment of lipid abnormalities may be used to minimize risk for atherogenic cardiovascular disorder & cerebrovascular accident in patients with diabetes.

PORD_11

Evaluation of TG/HDL Cholesterol ratio and non-HDL/HDL ratio as a marker of cardiovascular risk in Diabetes Mellitus

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Aim: To determine lipid profile levels in diabetics and non-diabetics and to evaluate cardiovascular risk using TG/HDLc ratio and Non HDLc/HDLc ratios.

Methodology: A hospital based cross-sectional study was conducted on 200 patients (100 Diabetics + 100 non-diabetics) in the age group 30-80 years. Out of the100 Diabetic cases (52 Male + 48 Female) and of the 100 non-diabetics 56 were males and 44 were females. All the participants underwent biochemical analysis - FBS, PPBS, HbA1c and lipid profile (TC, TG, HDL) performed on Automated Analyzer & LDL, VLDL and Non-HDL were calculated by computational methods. TG/HDLc ratio and Non HDLc/HDLc ratios were also calculated to assess cardiovascular risk. Biochemical & statistical analysis was done on all the selected 200 subjects.

Results: Total Cholesterol, TG, LDL & TG/HDLc ratio & Non-HDL/HDL ratio were found to be significantly increased in diabetics when compared with non-diabetics. HDL levels were found to be less in diabetics as compared to non-diabetics.

Conclusion: This study concludes that Non HDLc/HDLc ratio & TG/HDLc ratio can be used as early markers of cardiovascular risk.

Keywords: Diabetes Mellitus, Non HDLc, TG/HDLc ratio, Non-HDLc /HDLc ratio.

PORD_12

Study of lipase amylase ratio in acute pancreatitis

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Aim: To estimate serum amylase and serum lipase levels and to establish a correlation between lipase/ Amylase Ratio in Acute Pancreatitis using lipase and amylase as enzymatic markers.

Methodology: A hospital based cross-sectional study was conducted 130 cases (70 male and 60 female) and an equal number of controls 130 (70 male and 60 female) in the age group of 20-80 years were selected randomly for the study. Exclusion criteria was age less than 20years and more than 80 years, acute trauma, diagnosed cases of Diabetes mellitus, tuberculosis, Dyslipidaemia. 5ml blood was collected in sterile containers from all 260 subject and was analysed for serum Amylase and serum lipase on fully automated Biochemical Analyzer. Suitable Statistical analysis was done on all the selected subject.

Results: The mean values of Lipase levels were found to be much higher in male and female cases as compared to male and female controls respectively. Similarly, the mean values of serum amylase were higher in male and female cases than their respective controls. The Lipase/Amylase ratio in male and female cases were found to be higher than their respective controls.

Conclusion: Acute Pancreatitis is a serious disease with high mortality rate, but early detection and treatment results in better survival rate with good quality of life.

Keywords: Pancreatitis, Lipase, Amylase.

PORD_13

Delta bilirubin as a marker of Cholestasis.

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Aim: The aim of our study was to determine the significance of delta bilirubin in cholestasis and to establish a correlation with liver enzymes.

Methodology: A prospective study was conducted on patients attending the outpatient department of Medicine of tertiary care hospital. A total number of 60 cases and 50 controls in the age group 15-75 years were selected randomly. 5ml of venous blood was collected in sterile tubes from all 110 subjects (60 cases and 50 controls) and were analyzed for serum total bilirubin, direct bilirubin, indirect bilirubin, delta bilirubin, SGPT, SGOT, ALP and GGT.

Results: We observed that in cases of cholestasis there was an increase in the serum levels of delta bilirubin and conjugated bilirubin, ALP, GGT and Transaminases. The data was analyzed statistically and the values were expressed as (Mean+SD) and p-value was found to be highly significant.

Conclusion: We conclude that delta bilirubin plays a significant role in the diagnosis of different types of jaundice specially cholestatic jaundice.

Keywords: Cholestatic jaundice, Delta bilirubin, GGT, ALP, SGPT, SGOT.

PORD_14

Pneumatic Tube Validation: Enhancing Precision in Cancer Treatment at a Tertiary Care Hospital

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Aim: To compare the percentage variation among samples transported manually and through pneumatic Tube.

Methodology: Two methodologies were used to evaluate the impact on the 33 standard laboratory tests, which are recognized as the most sensitive parameters impacted.

The most common way of validating pneumatic tube systems is to compare blood samples transported by pneumatic tube systems to blood samples transported by hand. High speeds and rapid acceleration of blood samples can increase the risk of hemolysis and negatively affect sample quality and test results.

Six tubes of blood were drawn from 9 patients and placed in fluoride tube (for glucose) and plain vial for (Urea, Uric acid, Creatinine, Sodium, Potassium, Chloride, Bicarbonate, Calcium, Phosphorus, Magnesium, Total protein, Albumin, Alkaline phosphatase, Total bilirubin , Direct bilirubin , and Lactate Dehydrogenase (LDH),AST, ALT, Amylase, Lipase ,Iron, UIBC, Cholesterol, Triglyceride , HDL, LDL , CK-NAC, GGT, CKMB, Indirect bilirubin, Globulin.

Comparative research will be conducted on a sample size of twenty healthy adult volunteers to assess the integrity of the sample. The main objective of our study was to evaluate the effects of PTS transportation on laboratory results and whether is there any difference as compared to hand courier method.

Results: The percentage variation noted was between (-9.09 to 5) which is under the acceptance range. Hence, the pneumatic Tube validated as per the results with minimum variation obtained.

PORD_15

Correlation Between Serum Ldh And Framingham Risk Score [Frs] In Predicting Cardiovascular Disease [Cvd] In Patients Of Bundelkhand Medical College Sagar [Mp]

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Introduction: Cardiovascular diseases (CVD) are a major cause of morbidity in India. The Framingham Risk Score (FRS) is widely used for predicting 10-year CVD risk. Serum Lactate Dehydrogenase (LDH) is a biochemical marker of cellular injury and metabolic stress. Limited data exists correlating LDH with FRS in the Sagar population.

Aim: To assess the correlation between serum LDH levels and Framingham Risk Scores in predicting cardiovascular disease among patients attending Bundelkhand Medical College, Sagar (M.P.).

Methods: A cross-sectional study was conducted on 120 adult patients. Serum LDH was measured. FRS was calculated using age, sex, SBP, cholesterol, HDL, smoking, and diabetes. Patients were categorized into low (<10%), intermediate (10–19%), and high (≥20%) risk groups. Statistical analysis was done using Pearson correlation.

Results: Mean serum LDH increased progressively across FRS categories: Low risk: 202 ± 28 U/L, Intermediate risk: 244 ± 32 U/L, High risk: 298 ± 45 U/L.
A significant positive correlation was found between LDH and FRS
($r = 0.57$, $p < 0.001$). Smokers, hypertensive, and diabetic patients showed higher LDH levels.

Conclusion: Serum LDH correlates strongly with Framingham Risk Score and may serve as an inexpensive, supportive biomarker in early identification of cardiovascular risk, especially in resource-limited settings like Sagar.

Keywords: Framingham Risk Score, Cardiovascular Disease, Biomarkers

PORD_16

Comparison Of Serum Vitamin D Levels in Children With Beta Thalassemia And Normal Healthy Control

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Background: Beta thalassemia major is a genetically inherited (autosomal recessive) blood disorder characterized by the insuffiency and absence of haemoglobin beta chain synthesis resulting in the decrease in heamoglobin levels in red blood cells, reduction in the production of red blood cells and anemia. Anemia in beta thalassemia is caused by the reduced production and short lifespan of erythrocyte. This research work proposes to evaluate the association of vitamin D in children with beta thalassemia and normal healthy children.

Aims And Objectives: To determine the association between serum vitamin D levels in children with beta Thalassemia major.

Methodology: This study was conducted between age group of 5 and 17 years at department of Biochemistry of Sawai Man Singh Medical College and Hospitals in collaboration with Department of Pediatrics , JK Loan hospital. The correlation of serum Vitamin D levels was assessed.

Results: Body mass index was statistically significantly lower in the thalassaemic group ($P < 0.001$). It was observed that vitamin D levels were significantly lower in thalassaemic patients than in controls (P value < .0001). The mean serum 25-OH-vitamin D levels were 19.84 ±5.79 ng/ml and 44.98 ± 5.77 ng/ml, respectively; 22 cases (40%) had insufficient vitamin D, and 5 cases (9%) had deficient vitamin D. Regarding serum calcium and phosphorous, there was no significant difference between the thalassaemic and control groups.

Conclusion: Children with beta-thalassemia major had low body mass index and metabolic abnormality in the form of lower serum levels of vitamin D that signify the importance of therapeutic interventions

Keywords: Children, Phosphorous, Beta-thalassemia major, 25-OH- vitamin

PORD_17

Analytical Accuracy Of Glycated Albumin Surpasses Hba1c In Advanced Chronic Kidney Disease Patients

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Introduction: HbA1c is an established, long-term glycemic marker for Type 2 Diabetes Mellitus (T2DM). A key limitation is chronic kidney disease (CKD), which affects red cell turnover, causing underestimation of hyperglycemia. Glycated albumin (GA), a marker that reflects glycemic control for preceding 2-3 weeks, is an alternative.

Aim: To determine relative accuracy of GA and HbA1c in reflecting true glycemic status in advanced CKD patients

Methodology: This cross-sectional study included a cohort of N=50 adult T2DM patients meeting the inclusion criterion of Advanced CKD (KDIGO Stage G4/G5 i.e. eGFR<30). This group was chosen for the most severe red cell turnover abnormalities. The sample size was based on the CLSI guidelines for method comparison studies. HbA1c was measured by enzymatic assay on Beckman DxC 700 AU analyzer and GA was tested using ELISA. A Bland-Altman plot was used to quantify the magnitude of error between the two markers in this specific group.

Result: In the Advanced CKD patient group, the HbA1c values consistently depicted a large negative systematic error, averaging 1.5% lower than the GA values. This error was found to be statistically significant ($p<0.001$) and exceeds the Total Allowable Error for HbA1c, proving that it is unreliable for this patient population. GA proved to be accurate as it is independent of red cell turnover.

Conclusion: GA is superior to HbA1c for monitoring diabetes in patients with advanced CKD.

Keywords: Glycated Albumin, Advanced CKD, HbA1c, T2DM, Red Cell Turnover

PORD_18

Thyroid Profile (TSH, FT3, FT4) in Patients with Non-Alcoholic Fatty Liver Disease: A Pilot Cross-Sectional Study

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Introduction: Non-alcoholic fatty liver disease (NAFLD) is closely linked to metabolic dysfunction, and emerging evidence suggests a potential association between thyroid hormone imbalance and hepatic steatosis. Thyroid hormones play a key role in lipid metabolism, energy expenditure, and insulin sensitivity; however, their relationship with NAFLD in early clinical evaluation remains unclear.

Objective: To evaluate thyroid hormone levels—thyroid-stimulating hormone (TSH), free triiodothyronine (FT3), and free thyroxine (FT4)—in patients diagnosed with NAFLD and explore potential associations with disease presence and severity.

Method: A pilot cross-sectional study was conducted among adult patients with ultrasonographically confirmed NAFLD attending the outpatient clinic. Demographic data, metabolic parameters, and thyroid function tests (TSH, FT3, FT4) were recorded. Patients with known thyroid disease, alcohol use disorder, or hepatotoxic medication use were excluded. Thyroid parameters were compared with age- and sex-matched controls without NAFLD. Statistical analysis included t-tests/chi-square tests and correlation analysis.

Results: Patients with NAFLD demonstrated higher TSH levels compared with controls. FT3 and FT4 levels were either slightly lower or within the normal range, indicating a trend toward subtle thyroid dysfunction. The prevalence of subclinical hypothyroidism was higher in the NAFLD group. Additionally, higher TSH levels showed a positive association with the severity of hepatic steatosis on ultrasound.

Conclusion: The findings suggest that altered thyroid function, particularly elevated TSH, may be linked to NAFLD and its severity. Incorporating thyroid function assessment in NAFLD evaluation may help identify patients at risk for metabolic and endocrine disturbances. Larger studies are needed to confirm these observations.

Keywords: NAFLD, thyroid profile, TSH, FT3, FT4, subclinical hypothyroidism, metabolic dysfuction

PORD_19

Comparative study of serum homocysteine levels in COPD patients and healthy controls in Central India

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Aim: To estimate and compare the serum levels of homocysteine in COPD patients and healthy controls.

Methodology: A cross-sectional study was conducted over a period of 6 months in the Department of Biochemistry in collaboration with the Department of Respiratory Medicine, M G M Medical College & M Y Hospital, Indore. 70 diagnosed patients of COPD attending the OPD and IPD at M.Y. Hospital, Indore, were enrolled in the study after obtaining ethical approval and taking written informed consent. Age and gender-matched healthy individuals were taken as controls. 5 mL venous blood samples were collected under aseptic precautions, and serum homocysteine levels were measured. Data were expressed as mean ± SD and analysed using unpaired t-test and ANOVA. Statistical analysis was done using Epi Info software. p-value < 0.05 was considered significant.

Results: Most of the study participants were males under 70 years of age. Serum hepcidin levels were significantly higher in COPD patients compared to controls. The levels increased with the increasing severity of the disease.

Conclusion: Our study shows elevated levels of homocysteine in COPD patients, indicating that homocysteine might be involved in the disease pathogenesis.

PORD_20

Synovial Calprotectin: A Novel Biomarker In The Diagnosis Of Chronic Prosthetic Joint Infection – A Cross-Sectional Study

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Aim: To evaluate the role of synovial fluid calprotectin in the diagnosis of chronic prosthetic joint infection and to compare with conventional markers (CRP, ESR, synovial WBC count, cultures).

Methodology: Patients aged 18–75 years undergoing revision surgery for painful hip or knee prostheses were prospectively enrolled. Patients with recent intra-articular steroid injections or systemic inflammatory diseases were excluded. Synovial fluid was aspirated intra-operatively and blood samples were collected from the patients. Synovial fluid aspirates and Calprotectin levels were measured using ELISA. Diagnosis of chronic PJI was confirmed using Musculoskeletal Infection Society (MSIS) criteria. Diagnostic performance of calprotectin was compared with conventional markers (CRP, ESR, synovial WBC count, cultures). Sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of calprotectin were calculated.

Results: A total of 50 patients were included, of which 30 were diagnosed with chronic PJI. Mean synovial calprotectin levels were significantly elevated in the PJI group compared to aseptic group ($p < 0.001$). ROC analysis demonstrated an AUC of 0.92, with an optimal cutoff of 50-200 µg/mL yielding a sensitivity of 88.23%, specificity of 76.92%, PPV of 90.90% and NPV of 76.47%. Offering superior diagnostic accuracy compared to traditional serum markers and may serve as a valuable adjunct in the diagnostic algorithm of revision arthroplasty. Synovial calprotectin showed a better diagnostic accuracy superior to ESR, CRP, SF-WBC.

PORD_21

Serum Fetuin-A Levels in Patients with Psoriasis: A Case–Control Study

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Background: Psoriasis is a chronic immune-mediated inflammatory skin disorder associated with systemic inflammation and increased cardiometabolic risk. Fetuin-A, a glycoprotein synthesized by the liver, acts as a negative acute-phase reactant and plays a role in inflammation, insulin resistance, and vascular calcification. Altered Fetuin-A levels have been implicated in several inflammatory and metabolic disorders; however, its role in psoriasis remains inadequately explored.

Aim: To evaluate serum Fetuin-A levels in patients with psoriasis and compare them with healthy controls, and to assess its potential as a biomarker of disease-related inflammation.

Materials and Methods: This case–control study included 50 clinically diagnosed psoriasis patients and 50, age- and sex-matched healthy controls. Serum Fetuin-A levels were measured using enzyme-linked immunosorbent assay (ELISA). Routine biochemical parameters and inflammatory markers were also analyzed. Statistical analysis was performed using appropriate tests, and $p < 0.05$ was considered statistically significant.

Results: Serum Fetuin-A levels were found to be significantly lower in psoriasis patients compared to controls ($p < 0.05$). Reduced Fetuin-A levels showed an inverse association with markers of inflammation, suggesting its role as a negative acute-phase reactant in psoriasis.

Conclusion: Decreased serum Fetuin-A levels in psoriasis patients reflect underlying systemic inflammation and may contribute to the increased metabolic and cardiovascular risk associated with the disease. Fetuin-A may serve as a potential inflammatory biomarker in psoriasis, warranting further large-scale studies.

PORD_22

Role Of Hepcidin In Iron Deficiency Anemia Among Patients With Inflammatory Bowel Disease: A Prospective Observational Study

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Aim: To evaluate the role of hepcidin, a key iron-regulatory hormone, in the development of iron deficiency anaemia (IDA) among patients with inflammatory bowel disease (IBD).

Methodology: A cross-sectional observational study was conducted on patients diagnosed with IBD aged above 18 years. Subjects were classified into two groups: IBD patients with anaemia and IBD patients without anaemia and people having anaemia due to other causes were excluded. In patients clinical evaluation was done, complete blood count, serum iron studies, ferritin, C- reactive protein, and serum hepcidin levels were measured. Statistical correlation was performed to assess the relationship between hepcidin concentration, iron status, and inflammatory markers.

Results: Hepcidin levels were significantly higher in IBD patients with anaemia compared to those without anaemia. Elevated hepcidin showed a strong positive correlation with markers of systemic inflammation (CRP) and a negative correlation with serum iron and transferrin saturation. These findings suggest that inflammation-driven upregulation of hepcidin contributes to impaired iron absorption and sequestration, thereby aggravating iron deficiency anaemia in IBD patients.

PORD_ 23

A Study on Preanalytical Factors in Clinical Biochemistry: Reducing Errors for Improved Outcomes

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Aim: The study aimed to identify the specific profile and source of preanalytical errors prevalent in the high-volume environment of the Central Laboratory at MGM Medical College and MY Hospital, Indore, and to evaluate the effectiveness of a targeted quality improvement initiative in reducing these errors and improving clinical outcomes.

Methodology: This was a prospective interventional study conducted over six months (May to October 2025). In the Baseline Phase (May–July), reasons for sample rejection were meticulously tracked, focusing on Hemolysis, Insufficient Volume (QNS), and Clotting. An intervention was launched in August 2025, involving a focused, hands-on training workshop on proper venipuncture technique and adherence to the Order of Draw . The Post-Intervention Phase (Sept–Oct) monitored the Total Preanalytical Error Rate (TPER) and the median Turnaround Time (TAT) for critical tests.

Results: Baseline analysis showed a high TPER of 2.45%. Hemolysis accounted for the largest share of errors (51% of all rejections), primarily originating from the Emergency Room and ICUs. Following the intervention, the TPER dropped significantly to 0.95%, successfully meeting the laboratory's quality benchmark. The rate of Hemolysis decreased dramatically by 65%. This technical improvement directly resulted in a reduction of the median TAT for critical tests by an average of 20 minutes, enhancing the speed of clinical decision-making.

PORD_24

Comparison Of Analytical Throughput And

Turnaround Time of Two Hba1c Platforms In Routine Laboratory Practice

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Background: HbA1c measurement is a critical parameter in the diagnosis and long-term monitoring of diabetes mellitus, making analytical accuracy, throughput, turnaround time (TAT) essential factors in routine laboratory practice. With increasing sample volumes and the need for rapid reporting, laboratories often seek platforms that provide reliable results with optimal workflow efficiency. This study aims to evaluate and compare the operational performance of these two platforms.

Aim: To compare turnaround time for HbA1c analysis using Bio-Rad VARIANT II TURBO (HPLC) and Beckman Coulter DxC 700 AU (Enzymatic method) in a routine clinical laboratory.

Methodology: A cross-sectional analytical study was conducted on 120 consecutive EDTA samples. Identical pre-analytical handling was ensured. For both platforms, we noted the key time points: start of preparation, sample loading, time-to-first result, and time for completion of all 120 samples. Based on the recorded times, we computed key metrics such as hands-on time, analytical TAT, total batch TAT, and throughput measured in samples/min. Descriptive statistics and paired comparisons were performed.

Results: Preliminary observations indicated a substantially shorter analytical and batch TAT on DxC 700 AU compared to HPLC. Time-to-first result and throughput were higher on AU 700, whereas HPLC provided additional information such as chromatograms and variant flags. Workflow interruptions (QC, cartridge changes) had greater impact on HPLC.

Conclusion: In our setting, Enzymatic method demonstrated significantly faster TAT for routine HbA1c processing compared to Bio-Rad VARIANT II TURBO HPLC, making it operationally advantageous for high-volume laboratories. HPLC remains valuable for confirmatory testing and variant detection.

PORD_25

Early Biochemical Markers in Acute Pancreatitis: A Comparative Assessment of Amylase, Lipase, and Urinary Trypsinogen-2

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Background: Early diagnosis of acute pancreatitis is crucial for reducing morbidity and guiding timely management. Serum amylase and lipase are routinely used biochemical markers, but both have limitations in early presentations. Urinary trypsinogen-2, a marker released soon after acinar cell injury, has emerged as a promising tool for rapid diagnosis. This study compares the diagnostic performance of serum amylase, serum lipase, and urinary trypsinogen-2 in the early detection of acute pancreatitis.

Aim: To comparatively assess serum amylase, serum lipase, and urinary trypsinogen-2(uT2) as early biochemical markers in the diagnosis of acute pancreatitis.

Methodology: This cross-sectional analytical study was conducted over 8 months at M.Y. Hospital, Indore, comparing the diagnostic performance of serum amylase, serum lipase, and uT2 in 100 enrolled patients presenting with acute abdominal pain within 48 hours. Diagnosis of acute pancreatitis (AP) was confirmed using revised Atlanta criteria. Diagnostic accuracy metrics were calculated, and the DeLong test was used for formal statistical comparison of overall performance.

Results: Serum amylase showed moderate sensitivity (65%) and limited specificity. Lipase demonstrated higher overall diagnostic accuracy (82%). Crucially, uT2 exhibited the highest sensitivity (92%) and specificity (95%), yielding a strong Positive Likelihood Ratio (LR ~ 18). Statistical comparison confirmed that the overall diagnostic accuracy (AUC) of uT2 was significantly superior to both amylase and lipase ($P < 0.001$).

Conclusion: Urinary trypsinogen-2 is a statistically superior early biochemical marker for AP compared to amylase and lipase. It demonstrated high sensitivity and specificity confirming its robust diagnostic utility.

Keywords: Acute pancreatitis, lipase, amylase, urinary trypsinogen-2, early diagnosis, biomarkers

PORD_26

ABSTRACT

TOPIC: Difference between NGAL and cystatin c in CKD patients.

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Background:
Chronic kidney disease (CKD) is characterised by progressive nephron loss, involving both glomerular filtration decline and tubular stress. Traditional markers, such as serum creatinine and estimated glomerular filtration rate (eGFR), have several limitations for early disease detection. Cystatin C reflects glomerular filtration independently of muscle mass, whereas neutrophil gelatinase–associated lipocalin (NGAL) is released during tubular injury. Comparative evidence examining these two pathways across CKD severity remains limited.

Objectives:
To evaluate the cross-sectional association of serum NGAL, urinary NGAL, and serum cystatin C with eGFR across CKD stages, and to determine their diagnostic accuracy for identifying moderate-to-severe CKD.

Methods:
A cross-sectional analytical study was conducted among adults with CKD stages 1–5 attending a tertiary-care nephrology clinic. Participants underwent measurement of serum cystatin C, serum NGAL, urinary NGAL and serum creatinine. eGFR was calculated using the CKD-EPI 2021 creatinine-based equation. Associations with eGFR were assessed using Spearman correlations and multivariable linear regression, adjusting for age, sex, diabetes, hypertension and BMI. Diagnostic performance for identifying eGFR < 60 mL/min/1.73 m² was evaluated using ROC curves.

Results:
Among 220 participants (mean age 54.3 ± 13.7 years; 58% male), the median eGFR was 48.1 mL/min/1.73 m². Serum cystatin C demonstrated the strongest correlation with eGFR ($r = -0.82$), followed by serum NGAL ($r = -0.66$) and urinary NGAL ($r = -0.48$). In multivariable models, serum cystatin C exhibited the largest standardised regression coefficient ($\beta = -0.74$, $p < 0.001$). For detecting eGFR below 60 mL/min/1.73 m², the area under the curve (AUC) values were 0.93 for cystatin C, 0.86 for serum NGAL and 0.79 for urinary NGAL.

Conclusion:
Serum cystatin C showed a stronger association with renal function and the highest diagnostic accuracy for moderate-to-severe CKD. Serum and urinary NGAL offered additional insights into tubular stress, indicating complementary roles in comprehensive CKD assessment.

RESEARCH SCHOLARS

PORS_01

Role of Adipokine Omentin-1 and Oxidative Stress in type 2 Diabetes Mellitus patients with metabolic syndrome – a case-control study

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Background: In Type 2 Diabetes Mellitus, peripheral insulin resistance is largely due to a pronounced downregulation of insulin receptors. The condition is also characterized by elevated circulating levels of adipokines such as omentin, which may contribute to disruptions in glucose metabolism. However, the exact regulatory mechanisms governing the expression and activity of these adipokines remain unclear. Various factors—including metabolic syndrome, obesity, chronic inflammation, insulin resistance, and oxidative stress—have been proposed, but their specific contributions are still under debate.

Objectives: The aim of this work is to observe the role of adipokine omentin-1 and oxidative stress in type 2 diabetes mellitus patients with metabolic syndrome and controls and its correlation with other parameters.

Materials and methods: This case-control study was conducted on 294 individuals in the age group of 25-75 years, out of which 147 subjects were diagnosed with type 2 diabetes mellitus and 147 apparently healthy subjects serving as the control group. Participants underwent comprehensive history taking, detailed clinical examinations, anthropometric measurements, and both routine and specific laboratory investigations, including assessments of diabetic markers, lipid profile, serum omentin-1 levels and oxidative stress.

Results: The serum omentin-1 levels were significantly higher in the healthy controls in comparison with the case group ($p<0.0001$).

Conclusion: Decreased omentin levels in the case group might have contributed to the development of insulin resistance and diabetes mellitus.

Keywords: Omentin-1, Adipokines, Oxidative stress, T2DM, metabolic syndrome.

PORS_02

Estimation of MDA, GGT in non-alcoholic fatty liver patients

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Background: Non-Alcoholic Fatty Liver Disease (NAFLD) is a leading cause of chronic liver disease, strongly linked with obesity, diabetes, dyslipidemia, and metabolic syndrome. Oxidative stress plays a major role in its pathogenesis by promoting lipid peroxidation and hepatocellular injury. Malondialdehyde (MDA), Gamma-glutamyl transferase (GGT), and Glutathione (GSH) are key biochemical indicators reflecting oxidative damage and antioxidant status in NAFLD.

Aim: To evaluate serum glutathione as a potential antioxidant biomarker in patients with Non-Alcoholic Fatty Liver Disease (NAFLD). Objectives: To estimate serum glutathione (GSH) levels in NAFLD patients. To estimate serum malondialdehyde (MDA) levels. To estimate serum gamma- glutamyl transferase (GGT) levels and correlate them with disease severity.

Materials and Methods: A cross-sectional study was conducted in the Department of Biochemistry in association with General Medicine and Radiology, Rama Medical College Hospital & Research Centre. A total of 50 subjects were included—25 ultrasonographically diagnosed NAFLD patients and 25 age- and sex-matched healthy controls. Serum GSH was estimated by Ellman's method (DTNB, 412 nm), MDA by the Thio-barbituric acid method, and liver enzymes (ALT, AST) by IFCC- recommended methods. Statistical analysis was performed to assess differences and correlations among biomarkers.

Results: NAFLD patients showed significantly reduced serum glutathione levels compared to controls ($p < 0.001$), indicating impaired antioxidant defense. MDA and GGT levels were significantly elevated ($p < 0.001$), reflecting enhanced oxidative stress and hepatic injury. A strong negative correlation was observed between GSH and both MDA and GGT levels.

Conclusion: The findings suggest that oxidative stress plays a crucial role in NAFLD pathogenesis. Decreased GSH and elevated MDA and GGT levels can serve as non-invasive biochemical markers for assessing oxidative stress and disease progression in NAFLD.

Keywords: Non-Alcoholic Fatty Liver Disease, Glutathione, Malondialdehyde, Gamma-

Glutamyl Transferase, Oxidative Stress.

PORS_03

Biochemical and Proteomic Evaluation of Bacteriophage–Bacteria Interactions in Multidrug-Resistant *A. baumannii*

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Multidrug-resistant (MDR) *Acinetobacter baumannii* is a critical nosocomial pathogen exhibiting extensive resistance to current therapeutics, necessitating alternative antimicrobial strategies such as phage lytic proteins. These virion-associated proteins can degrade bacterial cell walls, disrupt cellular integrity, and facilitate targeted killing. The present study focuses on the extraction, precipitation, quantification, and comparative profiling of total bacterial proteins, whole-phage proteins, and phage-treated bacterial proteins to understand protein-level alterations during infection.

MDR *A. baumannii* isolates P1646 (Aci01) and ST1687 (Aci02) were cultured to mid-log phase, lysed using lysozyme–sonication, and the soluble fraction was precipitated using 20% TCA under chilled conditions. Whole-phage proteins from virions φAciA1R1 and φAciA1R2 were isolated using parallel non-denaturing and denaturing protocols, followed by TCA or cold acetone precipitation and dialysis. Total protein concentrations from bacteria, purified phage, and phage-treated lysates were determined using the Bradford assay with BSA as the standard. Comparative protein profiling was performed by SDS–PAGE, with samples normalized to 22 µg per lane and resolved on 10% polyacrylamide gels.

The BSA calibration curve exhibited strong linearity ($R^2 > 0.99$). Intact *A. baumannii* lysates showed the highest protein concentrations (1.220–1.237 mg/mL), whereas purified phages displayed the lowest (0.038–0.04 mg/mL). Mixed bacteria–phage samples exhibited marginal increases due to added phage protein mass. Post-lysis samples showed markedly reduced protein levels, indicating cellular degradation during phage infection. SDS–PAGE revealed nine distinct protein bands for Aci01 and Aci02, four for φAciA1R1 and φAciA1R2, and five bands in infected samples, reflecting significant protein loss following bacteriophage action.

In conclusion, the study demonstrates clear protein-level changes associated with phage-mediated lysis of MDR *A. baumannii*, supporting the potential of phage lytic proteins as targeted antimicrobial agents.

Keywords: *Acinetobacter baumannii*, phage lytic protein, protein precipitation, SDS–PAGE, TCA, multidrug resistance, bacteriophage proteins.

PORS_04

Comparative Analysis of Glucose and Lipid Profile Levels in Newly Diagnosed Breast Cancer Patients and Healthy Controls at SMS Medical College, Jaipur

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Aim: To evaluate and compare blood glucose and serum lipid profile levels in newly diagnosed breast cancer patients and healthy controls attending SMS Medical College & Attached Hospitals, Jaipur.

Methodology: A hospital-based comparative study was conducted in the Department of Biochemistry in collaboration with the Department of Oncology, SMS Medical College & Attached Hospitals, Jaipur. Forty-five newly diagnosed breast cancer patients and forty-five age-matched healthy controls were enrolled following informed consent and ethical clearance. Venous blood samples were collected under aseptic conditions to assess blood glucose levels and components of the lipid profile. Data were entered into Microsoft Excel. Continuous variables were presented as mean±standard deviation and compared using Student's t-test. Statistical significance was defined as $p < 0.05$.

Result: The mean blood glucose level in newly diagnosed breast cancer cases was found to be significantly increased compared to healthy controls. In contrast, total cholesterol and low-density lipoprotein (LDL) levels were significantly lower in cases than in controls. There was no significant difference in the levels of triglycerides, high-density lipoprotein (HDL), and very low-density lipoproteins (VLDL) between cases and controls. the altered metabolic profile observed in breast cancer cases suggests a potential link between glucose and lipid metabolism dysregulation in tumorigenesis. These findings highlight the importance of monitoring metabolic markers in breast cancer patients for better understanding of disease progression and management.

PORS_05

Simultaneous Quantification of Common Dietary Chemicals and Endocrine Disruptors in Human Serum and Food Matrix Using High-Throughput LC-MS/MS

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Introduction: Modern diets rely on processed foods, creating a 'chemical cocktail' of intentional preservatives, viz., sodium benzoate and/or packaging leachates (e.g., phthalates). While regulated individually, their cocktail effect poses potential synergistic toxicity. Current protocols typically isolate food safety testing from biomonitoring, obscuring the true exposure-response relationship.

Methodology: Based on a comprehensive literature review utilizing a dual-path extraction protocol to handle matrix diversity: protein precipitation with Solid Phase Extraction (SPE) for serum to ensure high recovery, and modified QuEChERS for food matrices. This workflow facilitates simultaneous quantification of preservatives and plasticizers on a high-throughput LC-MS/MS instrument, ensuring sensitivity while significantly reducing analytical time and costs compared to separate runs.

Results: Pilot data support this unified approach. Market basket analysis (n=50) revealed that 60% of packaged foods contained detectable levels of both Sodium Benzoate and Phthalates. Crucially, biomonitoring (n=20) demonstrated a significant positive correlation: participants with high serum benzoate consistently exhibited elevated phthalate burdens. These findings confirm a direct link between dietary intake and internal chemical load, suggesting diet is a primary driver of exposure.

Conclusion: This study demonstrates the clinical relevance of simultaneous contaminant monitoring. By bridging food safety analysis and human risk assessment, this unified LC-MS/MS protocol provides a resource-efficient framework for evaluating realistic chemical risks and 'cocktail effects' in everyday diets, offering data to inform future regulatory policies.

Keywords: LC-MS/MS; Biomonitoring; Cocktail effect; Synergistic Toxicity.

PORS_06

The association of TNF-β gene polymorphism in oral cancer risk

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Background: In India, where tobacco, areca nut use, alcohol, and poor oral hygiene are risk factors, oral squamous cell carcinoma is the most common oral malignancy and a major health issue. More evidence shows that chronic inflammation is crucial to carcinogenesis beyond these traditional exposures. Chronic inflammation causes oxidative stress, DNA damage, altered cellular signaling, angiogenesis, immune evasion, and tumor progression. The pro-inflammatory cytokine TNF-β, also known as lymphotoxin-α, plays a crucial role in immune regulation, apoptosis, and lymphoid tissue organization. Single nucleotide polymorphism (SNPs) of inflammatory genes, including the TNF-β −252 A>G polymorphism, can impact cytokine expression and cancer susceptibility. Limited and inconsistent data exist on the role of TNF-β polymorphisms in OSCC.

Methods: There were 55 healthy controls and 45 OSCC cases with histopathological confirmation in this case-control study. TNF-β −252 A>G variants were analysed using PCR-based genotyping and genomic DNA extraction. Chi-square test and strength of associations were estimated by odds ratio with 95% confidence intervals.

Results: Both OSCC cases (71.1%) and controls (65.5%) had the highest frequency of the AA genotype. When compared to AA, the GG genotype showed a non-significantly higher risk (OR = 1.50; 95% CI = 0.31–7.22; p = 0.70) whereas the AG genotype showed a non-significant protective trend (OR = 0.63; 95% CI = 0.25–1.63; p = 0.36).

Conclusion: In this group, there was no discernible correlation between OSCC risk and the TNF-β −252 A>G polymorphism. The results were not statistically significant, despite the fact that there were minor trends toward risk and protective effects for the GG and AG genotypes, respectively

Keywords: TNF-β, −252 A>G SNP, SNP, inflammation, genetic susceptibility. PCR-RFLP, oral cancer.

PORS_07

Impact of Endocrine Disrupting Chemicals on Fibroadenoma: Analyzing a Conserved Genomic Hotspot

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Introduction: Fibroadenoma, a common benign breast tumor, has limited understanding of its molecular etiology, including gene interactions, gene-environment interactions (involving hormone/growth factor/cytokine genes), and chemical exposures; EDCs (BPA, phthalates, pesticides) modulate cell regulatory pathways. This study aims to examine copy number variations (CNVs) and loss of heterozygosity (LOH) associated with fibroadenoma risk, as well as chemical exposures as risk modifiers of fibroadenoma in Indian women, to reveal gene-environment interactions for targeted prevention.

Methods: A systematic literature search on PubMed, Web of Science, Scopus, and MEDLINE identified 14 articles on fibroadenoma molecular studies and EDC exposures, published till 2025. Of these, 13 related to breast oncology and EDCs, while one focused on fibroadenoma, employing DNA extraction from fresh/FFPE tissues, PCR amplification, Sanger sequencing, pairwise alignment (EMBOSS Needle), 12 in silico pathogenicity tools (SIFT, PolyPhen-2, Mutation Assessor, TransFIC, etc.) with consensus scoring (>6/12), I-TASSER protein modeling, multiple sequence alignment (Muscle v.3.8.31), and Jalview v.2.8 visualization.

Results: One primary study found MED12 exon 2 mutations in 40% of Indian fibroadenomas (n=80) vs. 0% breast cancer controls (n=20) using DNA extraction, PCR-Sanger sequencing, in silico tools, and I-TASSER modeling (codon 44 hotspot). Synthesis of 13 papers linked EDCs (BPA: 0.4–4.2 µg/kg-bw/day; DDT/atrazine: 0.03–0.0123 µg/kg-bw/day) to estrogenic breast effects, lacking direct fibroadenoma evidence in Indian women.

Conclusion: This integrative genomic environmental approach will provide new insights into fibroadenoma pathogenesis, identify potential biomarkers for early risk assessment, and clarify how environmental endocrine disruptors interact with genetic background. The findings may support the development of precision screening strategies and promote public health awareness regarding modifiable EDC exposures in women's reproductive health.

Key words: Fibroadenoma; Genetic risk loci; Hormone signaling; Cytokines; EDC exposure; Gene environment interaction; Functional validation

PORS_08

P16 gene polymorphism and expression as a biomarker for oral diseases

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Background: Oral cancer progresses from normal epithelium to dysplasia, oral intraepithelial neoplasia, and finally invasive squamous cell carcinoma driven by genetic and environmental factors. This study investigated the association between *p16* gene and its 450 C>G (rs11515) polymorphism with risk of oral diseases.

Method: The study included 230 individuals with precancerous oral conditions (70 with leukoplakia, 90 with OSMF and 70 with lichen planus), 72 oral cancer patients and 300 cancer-free healthy controls. Genotyping of the *p16* 450 C>G polymorphism was analysed using PCR-RFLP methods, genotype and allele frequencies were conducted using chi-square test. While *p16* gene expression levels were measured by RT-PCR among oral patients and controls.

Results: The findings revealed that G allele of *p16* 450 C>G polymorphism significantly increased risk of oral diseases compared to C allele (OR 1.67, $p = 0.0001$). GG genotype was associated with higher risk of OSMF (OR 4.63, $p = 0.0001$), lichenplanus (OR 3.93, $p = 0.0002$), and leukoplakia (OR 2.38, $p = 0.02$) compared to CC genotype. Smokers and tobacco chewers carrying the G allele were at a significantly increased risk of developing precancerous oral lesions (OR = 3.78 and 2.89). Carrier of G allele, who were both smoker and tobacco chewer had an increased risk of oral cancer (OR 248.74, p=0.0001). Notably, *p16* transcript expression was significantly elevated (13.56-fold) in oral cancer patients compared to controls.

Conclusion: These findings suggest that *p16* gene polymorphism may be associated with risk of oral diseases.

Keywords: Oral cancer, Pre oral cancer, *P16*, Polymorphism

PORS_09

Simultaneous Quantification of Common Dietary Chemicals and Endocrine Disruptors in Human Serum and Food Matrix Using High-Throughput LC-MS/MS

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Introduction: Modern diets rely on processed foods, creating a 'chemical cocktail' of intentional preservatives, viz., sodium benzoate and/or packaging leachates (e.g., phthalates). While regulated individually, their cocktail effect poses potential synergistic toxicity. Current protocols typically isolate food safety testing from biomonitoring, obscuring the true exposure-response relationship.

Methodology: Based on a comprehensive literature review utilizing a dual-path extraction protocol to handle matrix diversity: protein precipitation with Solid Phase Extraction (SPE) for serum to ensure high recovery, and modified QuEChERS for food matrices. This workflow facilitates simultaneous quantification of preservatives and plasticizers on a high-throughput LC-MS/MS instrument, ensuring sensitivity while significantly reducing analytical time and costs compared to separate runs.

Results: Pilot data support this unified approach. Market basket analysis (n=50) revealed that 60% of packaged foods contained detectable levels of both Sodium Benzoate and Phthalates. Crucially, biomonitoring (n=20) demonstrated a significant positive correlation: participants with high serum benzoate consistently exhibited elevated phthalate burdens. These findings confirm a direct link between dietary intake and internal chemical load, suggesting diet is a primary driver of exposure.

Conclusion: This study demonstrates the clinical relevance of simultaneous contaminant monitoring. By bridging food safety analysis and human risk assessment, this unified LC-MS/MS protocol provides a resource-efficient framework for evaluating realistic chemical risks and 'cocktail effects' in everyday diets, offering data to inform future regulatory policies.

Keywords: LC-MS/MS; Biomonitoring; Cocktail effect; Synergistic Toxicity.

PORS_10

Upregulation of Circular RNAs and ER Stress Response Genes in Oral Carcinoma: Insights from Tissue and Blood Expression Profiling.

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Introduction: Oral carcinoma (OC), ranking as the sixth most common cancer globally, is closely associated with the dysregulation of endoplasmic reticulum stress response (ERSR) genes and circular RNAs (circRNAs). This study aims to elucidate their role in OC pathogenesis. The objective of this study was to investigate the expression of ERSR genes and circRNAs in OC.

Methods: We hypothesized that ERSR genes and circRNAs are dysregulated in OC, contributing to its malignant phenotype. To test this, we examined the expression of ERSR-related genes and two circRNAs in OC using qRT-PCR in tissue and blood samples from 35 OC patients and controls. The relative fold change in gene expression was calculated using the $2^{-(\Delta CT)}$ method.

Results: Our results revealed that OC patients, predominantly male, exhibited higher rates of alcohol consumption (38%), smoking (62%), and tobacco chewing (90%) compared to controls. A shift from rural (46%) to urban (54%) residences was also observed. The buccal mucosa was the common OC site (35%). Most tumors showed moderate differentiation (68%), with varying T stages (T0: 8%, T1: 4%, T2: 40%, T3: 28%, T4: 20%) and N stages (N0: 64%, N1: 4%, N2: 12%, N3: 5%). We observed significant overexpression of CirRNA-CDR1S in OC tissue (4.64-fold, $p=0.048$) and blood (1.89-fold, $p=0.042$). CirRNA10036 also showed higher expression in OC tissue (3.98-fold, $p=0.034$), with a slight increase in blood (2.0-fold, $p<0.05$). Among ERSR genes, GRP-78 showed a 3.2-fold ($p=0.03$) increase in tissue and a 3.1-fold ($p=0.046$) increase in blood. CHOP increased 1.93-fold ($p=0.043$) in tissue and 2.32-fold ($p=0.05$) in blood. ATF6 was overexpressed 3.8-fold ($p=0.036$) in tissue and 7.4-fold ($p=0.012$) in blood.

Conclusion: These findings underscore the potential role of ERSR genes and circRNAs in OC pathogenesis, highlighting their significance in the disease's molecular landscape.

Keywords: Oral carcinoma, Endoplasmic reticulum stress, circRNAs, GRP-78, CHOP, qRT-PCR

PORS_11

Interplay Between Toxic Metals, ER Stress Gene Expression, and Metabolic Dysfunction in Newly Diagnosed Type 2 Diabetes Mellitus.

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Background: Type 2 diabetes mellitus (T2DM) involves complex interactions between metabolic dysfunction, environmental exposures, and cellular stress pathways. Toxic metals such as arsenic and nickel can induce oxidative and endoplasmic reticulum (ER) stress, potentially aggravating insulin resistance and β-cell dysfunction. This study evaluated toxic metal burden and ER stress gene expression in newly diagnosed T2DM patients. Here, we assessed serum levels of toxic metals (Al, Ni, As, Hg, Pb, Cd), ER stress gene expression (GRP78, CHOP, IRE1, ATF4, ATF6, PERK, XBP1), and their associations with glycemic markers, lipid profile, and insulin sensitivity/resistance in T2DM.

Methods: A case–control study included 92 untreated T2DM patients and 63 age and sex-matched healthy controls. Toxic metals were quantified using ICP-MS, and ER stress gene expression in PBMCs was assessed by qRT-PCR. Biochemical parameters, insulin resistance (HOMA-IR), and insulin sensitivity (QUICKI) were evaluated. Correlations and multivariate regression analyses identified independent predictors of glycemic outcomes.

Results: T2DM patients had significantly higher FBS, HbA1c, fasting insulin, HOMA-IR, and dyslipidemia (all $p<0.0001$). Arsenic (1.85 ± 1.78 vs. 0.48 ± 0.3 ppb) and nickel (4.75 ± 2.45 vs. 0.65 ± 0.76 ppb) levels were markedly elevated in T2DM ($p<0.0001$). ER stress genes GRP78, CHOP, IRE1, ATF4, ATF6, and XBP1 were significantly upregulated, while PERK was downregulated. Arsenic and nickel showed strong positive correlations with insulin, HOMA-IR, HbA1c, and XBP1 expression. In multivariate analysis, arsenic ($\beta=0.28$; $p=0.007$) and XBP1 ($\beta=0.25$; $p=0.013$) independently predicted HbA1c.

Conclusion: Elevated arsenic and nickel levels are strongly associated with ER stress activation and poor glycemic status in T2DM. Upregulation of XBP1 and increased arsenic exposure independently contribute to higher HbA1c, suggesting a mechanistic link between environmental metal burden, ER stress, and early T2DM pathogenesis.

Keywords: T2DM; Toxic Metals; Endoplasmic Reticulum Stress Response (ERSR); XBP1; Insulin Resistance; Gene Expression.

PORS_12

CircRNA HIPK3 and CDC14A Expression Correlates with Infarction and Severity in Ischemic Stroke

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Background: Circular RNAs (circRNAs), generated through back-splicing of precursor mRNAs, are highly stable and functionally versatile non-coding RNAs. They modulate gene expression via post-transcriptional and translational regulation and have been implicated in the pathophysiology of various diseases, including ischemic stroke (IS). This study aimed to evaluate the expression profiles of circRNAs HIPK3 and CDC14A and their association with clinical indicators of IS severity.

Methods: In this prospective case-control study, 100 participants were enrolled: IS patients (n=50), normal controls (NC, n=25), and diseased controls (DC; seizures, migraines, headaches; n=25). Infarct volume was quantified via neuroimaging, and stroke severity was assessed using the NIH Stroke Scale (NIHSS) via the Medscape app. Circulating levels of circRNAs HIPK3 and CDC14A were measured using quantitative RT-PCR, and relative expression was calculated using the 2^−ΔCT method.

Results: The mean age of IS patients (57.16), disease controls (51.54), and normal controls (50.03). A strong positive correlation was observed between infarct volume and NIHSS score ($r = 0.791$, $p < 0.0001$). CircRNA HIPK3 and CDC14A are significantly upregulated in IS patients compared to both control groups. Both circRNAs were significantly upregulated in IS patients compared to controls. HIPK3 exhibited the highest differential expression (4.00-fold vs NC; 1.66-fold vs DC), followed by CDC14A (1.66-fold vs NC; 1.44-fold vs DC). Notably, HIPK3 expression showed a moderate negative correlation with infarct volume ($r = -0.502$, $p = 0.014$) and NIHSS score ($r = -0.427$, $p = 0.021$). CDC14A showed weaker, non-significant correlations with these clinical endpoints.

Conclusion: CircRNAs HIPK3 and CDC14A are significantly upregulated in IS patients, with HIPK3 showing a stronger association with infarct volume and neurological severity. These findings suggest their potential utility as circulating biomarkers for assessing stroke severity and guiding prognostic evaluation.

Keywords: Circular RNA, CircRNA HIPK3, CircRNA CDC14A Ischemic Stroke, NIHSS Score, Infarct Volume, Prognostic Biomarker.

PORS_13

Protective Efficacy of Quercetin in Cadmium-Induced Cognitive Deficits Associated with AMPA-R and STEP Signaling

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Background and Objective- Exposure to cadmium, a heavy metal distributed in the environment is a cause of concern due to associated health effects in population around the world. Recently, we observed that Cd induced cognitive deficits are associated with cholinergic and NMDA-R alterations in rat hippocampus. Continuing with the leads, the present study is aimed to identify targets in cadmium induced cognitive deficits with focus on to assess the integrity of α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA-R) receptors and STriatal Enriched protein tyrosine Phosphatase (STEP) signaling in rat hippocampus. Further, protective potential of quercetin, a natural bioflavonoid, was also assessed.
Methodology- Rats were randomly divided into four treatment groups and exposed to cadmium (5mg/kg, body weight p.o. for 28 days) or quercetin (25mg/kg body weight p.o. for 28 days) alone or simultaneously. A group of rats treated with vehicle that served as control was also included. Rats were sacrificed 24 hours after the last dose of treatment and hippocampus was dissected out and processed for transcriptional, translational and ultrastructural studies.
Results- A decrease in mRNA expression and protein levels of AMPA-R subunits (GluA1, GluA2, and GluA3) was observed in cadmium treated rats as compared to controls. Also, there was a decrease in the levels of proteins associated with AMPA-R downstream signalling: GRIP1, Synaptophysin, FyN/pFyN, PyK2/pPyK2, and PTPα/pPTPα in hippocampus of cadmium treated rats. These changes were associated with increase in the levels of STEP61/pSTEP61 that resist synaptic plasticity in hippocampus. Damage in myelin sheath, synaptic membrane and synaptic vesicles in hippocampus of cadmium treated rats was also evident in ultrastructural studies as compared to controls. Simultaneous treatment with quercetin was found to protect cadmium induced changes in rat hippocampus. The decrease in the expression of AMPA-R subunits and its signalling proteins associated with increased expression of STEP in hippocampus may be attributed to impaired learning and memory in cadmium treated rats.
Conclusion- It is interesting that quercetin has the ability to modulate these receptors/signaling targets and ameliorate cadmium induced synaptic and memory loss.
Acknowledgement- Financial support for the study provided by the CSIR – Indian Institute of Toxicology Research, Lucknow, Academy of Scientific and Innovative Research (AcSIR), Ghaziabad and Research Fellowship provided by Department of Science & Technology, New Delhi, India.

PORS_14

Environmental-metal induced angiogenic dysregulation in pathogenesis of hypertensive disorders of pregnancy

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Background: Hypertensive disorders of pregnancy (HDP) are a major cause of maternal and fetal morbidity and mortality. Evidences suggest that toxic element imbalance may contribute to HDP through disruption of angiogenic pathways. This study investigated the association between heavy metals (Ni, As, Hg, Al, Pb, and Cd), angiogenic markers (PlGF and sFlt-1), sFlt-1/PlGF ratio, and the risk of developing HDP.
Methods: In this study 203 women with HDP and 199 normotensive pregnant controls were selected from a tertiary care centre. Serum concentrations of trace elements were quantified using ICP-MS, while sFlt-1 and PlGF were measured on the Cobas Integra 6000 using manufacturer-provided assays.
Results: Women with HDP had significantly higher serum levels of Ni ($p<0.017$), As ($p=0.001$), and Hg ($p=0.001$) compared with controls. The median sFlt-1/PlGF ratio was significantly greater in the highest quartile (Q4: 50.27; IQR: 14.85–134.68) than in the lowest quartile (Q1: 34.61; IQR: 17.65–141.58) ($p=0.025$). In regression analysis, serum Ni ($\beta=4.47$; $p=0.001$), As ($\beta=0.08$; $p=0.001$), and Hg ($\beta=0.51$; $p=0.011$) emerged as significant independent risk factors for HDP. Gaussian process classifier and BKMR modelling indicated that Ni, As, and Hg increase the probability of HDP. Weighted Quantile Sum (WQS) regression further confirmed Ni as the predominant contributor (94%) to HDP risk, with Hg (1.4%) contributing moderately. Elevated levels of Ni, As and Hg are significantly associated with higher risk of HDP as well as with angiogenic biomarkers.
Conclusion: Elevated levels of Ni, As, and Hg are significantly associated with increased risk of HDP and correlate with dysregulation of angiogenic biomarkers, supporting a mechanistic link between toxic element exposure and impaired angiogenic balance in the pathogenesis of HDP.

Keywords: Hypertensive disorders of pregnancy (HDP), Toxic elements, Angiogenic biomarkers, sFlt-1/PlGF ratio, Preeclampsia

PORS_15

Association of toxic metals levels as a risk factor of type 2 diabetes mellitus in adults

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Introduction: Type 2 diabetes (T2DM) is a multifactorial disease influenced by the various endogenous and exogenous factors. Toxic metals may alter physiology of cells. The prevalence of diabetes is on surge after industrialization. Toxic metals have been implicated as risk factor for development of diabetes. However, the epidemiological data are disputed and limited. **Objective:** This study aimed to evaluate the level of cadmium (Pd), lead (Pb), aluminium (Al) and nickel (Ni) and its association with T2DM in Uttar Pradesh population. **Method:** A total 347 subjects were enrolled in this study from General Medicine OPD. 2 ml venous sample was collected each of EDTA and plain vials after 10-12 hours of fasting. Analysis of biochemical parameters (FBS, PP, and Lipid Profile) was done on Beckman coulter AU480. HbA1c was assessed through HPLC method (Bio-Rad Variant II Turbo). Fasting serum insulin was quantified through ECLIA method in Roche 601. QUICKI (Quantitative insulin sensitivity check index) was calculated using standard formula.Cd, Pb, Al and Ni levels was analysed through ICP-MS (Perkin Elmer 1000). The detectable level of metals considered as exposure group while non- detectable level considered as non-exposure. Risk was calculated by odds ratio (OR) and correlation between metals and diabetic markers was calculated by Pearson's correlation coefficient(r).

Result: Median of serum Al (206.16 µg/L), Cd (0.86 µg/L), Pb (0.57 µg/L) and Ni (1.61 µg/L) was significantly higher in T2DM as compared to control with $p<0.001$. Individuals having the cadmium (6.3-fold), lead (6.1-fold), aluminium (2.8-fold) and nickel (2.6-fold) were higher risk of T2DM compared to control. Al was correlated with HbA1c ($r=0.303$, $p<0.0001$), FBS ($r=0.354$, $p<0.001$).

Conclusion: Toxic metals levels (Cd, Pb, Al and Ni) were significant elevated and individuals at higher risk of T2DM.

Keywords: Aluminium, Nickel, Cadmium, Lead, Serum Insulin, QUICKI, Type 2 diabetes mellitus.

PORS_16

Unmasking CKDu in North India: A Pesticide Screening Study

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Background: Diabetes and hypertension are the primary contributors to chronic kidney disease (CKD) on a global scale; nevertheless, there are outbreaks of chronic kidney disease of unknown etiology (CKDu) occurring in north India, and other parts of the world. CKDu is more commonly seen in males working in agricultural occupations. According to recent studies, the states of Andhra Pradesh, Odisha, Goa, and Maharashtra in India have seen an upsurge in the number of people who have CKDu. The present study has been designed to screen pesticides in patients with CKDu as a possible cause in this area of the globe.

Methods: In this study, we have recruited 115 subjects (64 cases of CKDu and 51 age, sex & region matched control). The diagnosis of CKDu was established on the basis of KDIGO guideline. A panel of 131 pesticides were screened using Gas chromatography-tandem mass spectrometry (GC-MS/MS). Additionally, kidney function test (Urea and Creatinine) were estimated on a fully automated analyzer (Beckman Coulter, AU480). eGFR was calculated by using the CKD-EPI eGFR equation.

Result: Out of 131 pesticides, mean levels were significantly elevated in CKDu patients for 10 pesticides as compared to controls, namely 2-Phenylphenol (1.15±0.22 vs 0.16±0.06), fonofos (0.12±0.03 vs ND), transfluthrin (0.93±0.34 vs 0.25±0.11), p,p'-DDE (1.74±1.63 vs ND), sulprofos (0.29±0.09 vs ND), resmethrin (25.49±21.89 vs 2.80±1.32) ,tetramethrin (6.29±4.51 vs 0.05±0.01), azinophos (0.40±0.26 vs 0.10±0.08), permethrin (0.19±0.11 vs ND) and flucythrinate (46.11±21.53 vs ND) with $p<0.05$, respectively. Fonofos showed a positive correlation with urea ($r=0.461$, $p=0.035$) and creatinine ($r=0.454$, $p=0.039$). Similarly, sulprofos was negatively correlated with urea ($r=0.407$, $p=0.047$), and creatinine ($r=0.561$, $p=0.008$) while, positively correlated eGFR ($r=-0.496$, $p=0.022$). Tetramethrin also showed a positive correlation with the same (urea $r=0.40$, $p=0.033$; creatinine $r=0.481$, $p=0.027$)

Conclusion: The findings suggested that pesticides might have a causative factor in the development of chronic kidney disease.

Keywords: CKDu, Pesticides, GC-MS/MS, eGFR, CKD-EPI

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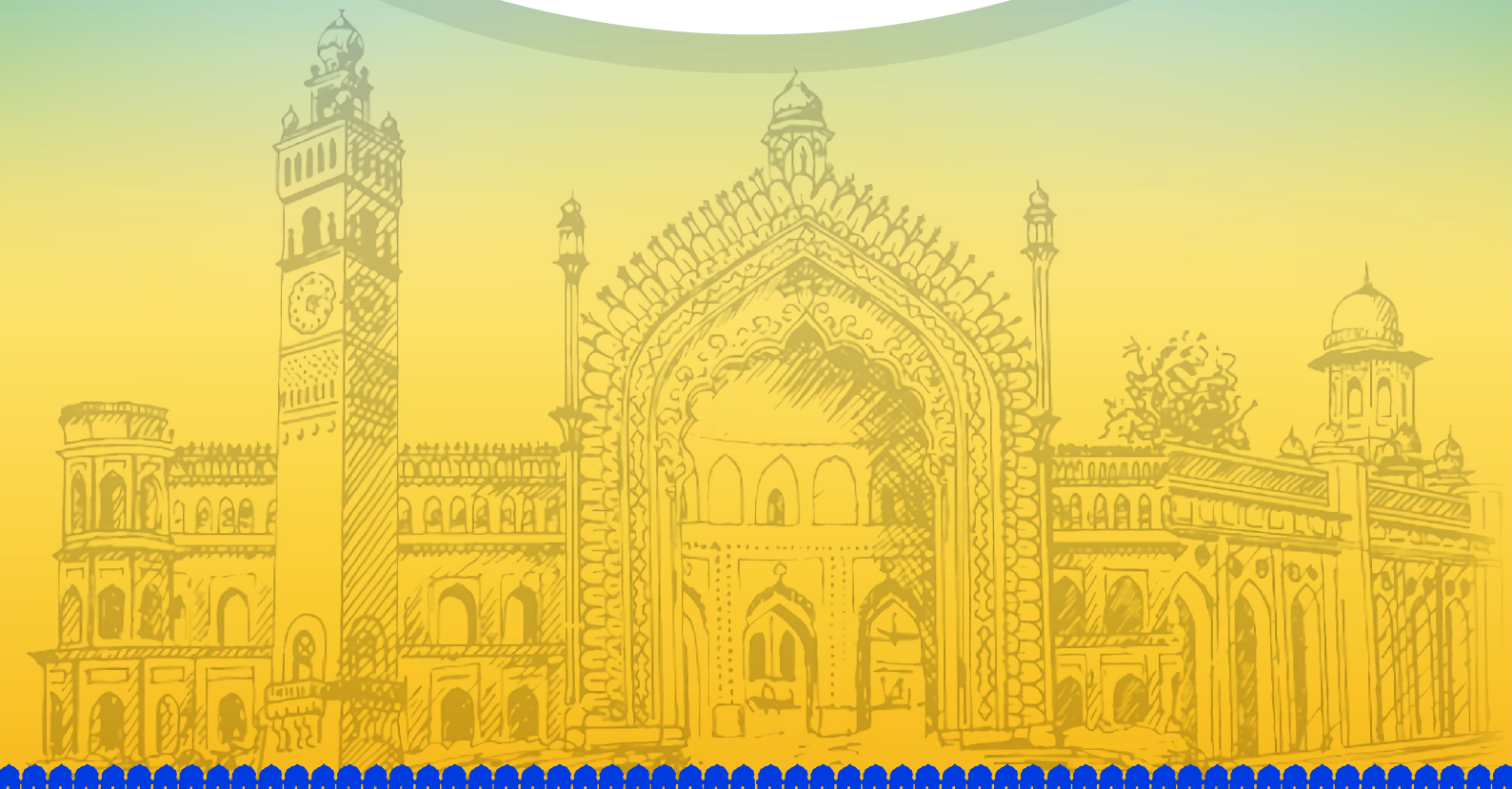

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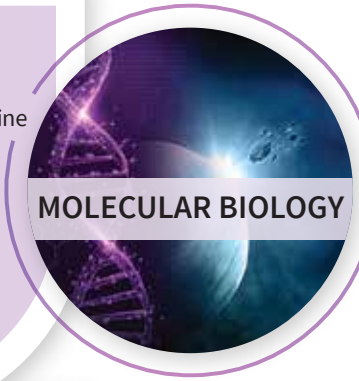

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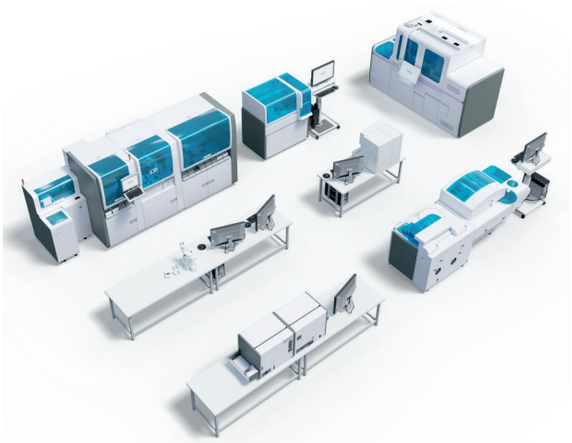

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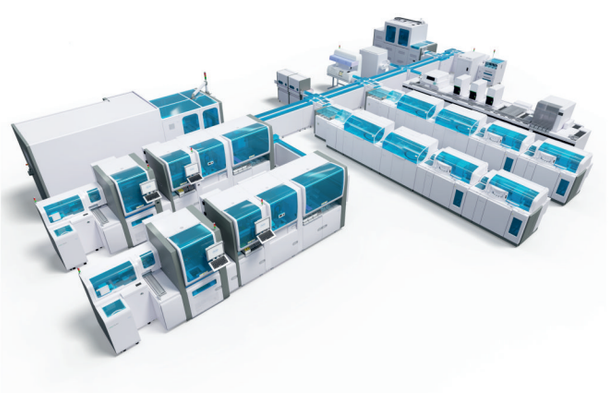

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LUCKNOW ATTRACTIONS

Rumi Darwaza

When you want to witness the grandeur of the Awadhi style of architecture, make your way to the Rumi Darwaza, an imposing gateway located between Bara Imambara and Chota Imambara. This gateway built in 1784 by Nawab Asaf-ud-Daula is about 60-feet tall and is generally used as the logo for Lucknow city. Since the gate is modeled after the Sublime Porte in Istanbul, it is sometimes referred to as the Turkish Gate.

Bhool Bhulaiyaa (Bara Imambara)

Counted among the top historical places in Lucknow, Bara Imambara aka Asafi Imambara is a historical monument that dates back to 1784. Built by Asaf-ud-Daula, one of the renowned Nawabs of Awadh, the complex comprises a large mosque (Asfi Mosque), a labyrinth (the Bhul Bhulaiya), and a stepwell with running water (Shahi Baoli). The structure boasts of two large gateways that will lead you to the central hall, which is touted to be the largest vaulted chamber in the world.

Janeshwar Mishra Park, Lucknow

An urban park located in Gomti Nagar, Janeshwar Mishra Park is dedicated to the late politician Janeshwar Mishra. It is designed after the Hyde Park in London and counts among the top eco-friendly parks in the country. There are two large water bodies within the park which attract lots of migratory birds all through the year. Complete with jogging and cycling tracks, walkways, play areas for kids, gondola rides, and lush green settings, the park serves as a green lung in the city where

Residency, Lucknow

Also called the Residency and the Residency Complex, the British Residency is a complex of buildings that once served as the residence of the British Resident General. Constructed in the last quarter of the 18th century, the place served home to over 3000 British residents during the Indian Rebellion of 1857. Currently, the Residency is in ruins and is a protected monument under the Archeological survey of India.

Ambedkar Park, Lucknow

A public park and memorial built across 107 acres in Gomti Nagar, Ambedkar Park honors Dr. Ambedkar, Jyotirao Phule, Kanshi Ram, Narayana Guru, and many other social reformers who worked for equality and social justice. A striking feature of the park is that the whole place is built using red sandstone bought in from Rajasthan. The key attractions here include the Ambedkar Stupa, Pratibimb Sthal with statutes of 62 elephants, the museum, and Dr. Bhimrao Ambedkar Samajik Parivartan Gallery, among others.

NEAR BY ATTRACTIONS

Ram Mandir, Ayodhya

Shri Ram Janmbhoomi Teerth Kshetra, which is the trust constituted to look after construction and management of Ram Temple in Ayodhya has set a target of letting devotees worship Ram Lalla in the new sanctum sanctorum of the temple from January 14, 2024. The temple's construction in Ayodhya started on August 5, 2020 after PM Modi laid foundation stone.

Kashi Vishwanath Temple, Varanasi

Kashi Vishvanath Temple is one of the most famous Hindu temples dedicated to Lord Shiva. It is located in Varanasi, Uttar Pradesh, India. The temple stands on the western bank of the holy river Ganga, and is one of the twelve Jyotirlingas, the holiest of Shivatemples. The main deity is known by the name Vishvanatha or Vishveshvara meaning Ruler of The Universe. Varanasi city is also called Kashi, and hence the temple is popularly called Kashi Vishvanath Temple.

Katrania Ghat, Lucknow

Katarniaghat Wildlife Sanctuary is located in the Upper Gangetic plains of Uttar Pradesh. It is a protected area marked for its Sal and Teak forests, green wetlands, swamps and wetlands. It is one of the only places in India where plenty of Gangetic dolphins can be found in Gairwa River. The wild residents of this sanctuary are tigers, leopards, antelopes, deer, crocodiles, turtles, different species of birds and a host of other mammals.

Jim Corbett National Park, Uttrakhand

The park is best known as a protected area for the critically endangered Bengal tiger of India. Tourism is allowed in selected areas of Corbett Tiger Reserve so that people get an opportunity to see its splendid landscape and the diverse wildlife living here. There are many accommodation facilities at Ramnagar as well as at the Corbett National Park. Being one of the most frequently visited parks in the country, the forest department and other agencies have their hotels, lodges, rest houses, log huts for the visitors.