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Abstracts of Oral Papers in MED-AI

Paper Abstract No.: 01

AI-driven Predictive Resource Optimisation and Medicine Inventory Management System for Hospital Capacity Planning: A Full-stack Solution at Vels Medical College and Hospital

SAMUEL JEBASEELAN GNANASEELAN[1]

ABSTRACT

Introduction: Efficient management of hospital resources is critical to maintaining quality patient care, particularly during periods of increased healthcare demand. Traditional resource allocation methods often rely on static estimates and manual inventory monitoring, resulting in bed shortages, staffing imbalances, medicine stockouts, and increased operational costs.

Aim: To develop a predictive hospital resource optimisation system capable of forecasting patient load and healthcare resource requirements. To design a centralised medicine inventory management platform that predicts future medication demand and recommends reorder points. To estimate future bed capacity requirements for 1-, 3-, and 5-year horizons using predictive analytics.

Materials and Methods: A full-stack web application was developed using Express.js and Vite architecture. Predictive analytics were integrated through Google and Gemini 3.5 Flash model using the @google/genai SDK. The system incorporates modules for patient flow forecasting, bed allocation, clinician roster management, and centralised medicine inventory monitoring.

Results: The developed platform successfully integrated predictive forecasting with hospital resource management workflows. The system generated 4-week patient flow projections and estimated future resource requirements. The inventory module monitored critical medications, PPE, and consumables while providing automated reorder recommendations to minimise stockouts and reduce wastage.

Conclusion: The proposed AI-driven predictive resource optimisation system demonstrates the potential of integrating machine learning-based forecasting with hospital operations management.

Keywords: Artificial intelligence, Bed capacity forecasting, Hospital resource management, Medicine inventory management, Predictive analytics.

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Paper Abstract No.: 02

Multi-centre Validation of the “Prognostic Cross”: Mean Platelet Volume and Neutrophil-Lymphocyte Ratio as Early Predictors of Recovery in Acute Viral Thrombocytopenia

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ABSTRACT

Introduction: This study evaluated the “Prognostic Cross,” defined as the simultaneous decline in Neutrophil-Lymphocyte Ratio (NLR) and rise in Mean Platelet Volume (MPV), as an early predictor of platelet recovery in patients with acute viral thrombocytopenia.

Materials and Methods: A retrospective multicentre study was conducted across two tertiary care hospitals. A total of 3,399 manually verified thrombocytopenic events were analysed, including 1,142 patients with serial haematological measurements. Patients with haematological malignancies, chemotherapy exposure, or primary marrow failure were excluded.

Results: Among 3,399 thrombocytopenic events, 78--84% demonstrated a regenerative pattern (MPV ≥10 fL), while approximately 36% exhibited elevated inflammatory stress (NLR 3.0). The Prognostic Cross was observed in 72% of patients in the discovery cohort and 76% in the validation cohort.

Conclusion: The Prognostic Cross represents a simple, cost-free, and reproducible haematological marker for early prediction of recovery in acute viral thrombocytopenia.

Keywords: Haematological malignancy, Marrow failure, Platelet recovery.

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Paper Abstract No.: 03

Predicting Reticulocyte Haemoglobin Equivalent (RetHE) and Delta Haemoglobin Equivalent (ΔHe) from Routine Complete Blood Count using a Random Forest Model

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ABSTRACT

Introduction: Reticulocyte haemoglobin equivalent (Ret HE) and delta haemoglobin equivalent (ΔHe=Ret HE–MCH) are sensitive real-time markers of iron-restricted erythropoiesis, but they require a specialised reticulocyte mode that many haematology analysers do not routinely perform. This limits their availability, particularly in resource-limited settings and in retrospective studies of large Complete Blood Count (CBC) databases.

Aim: To develop and externally validate a random forest model that predicts Ret HE and Delta HE using only standard CBC parameters that are routinely available from any 5-part or 6-part haematology analyser.

Materials and Methods: A Random Forest regressor (200 trees, max depth 12, random state 42) was trained on 19,456 CBC records from a Sysmex XN-series analyser, of which 464 samples had simultaneously measured Ret HE and Delta HE values.

Results: On the training set (n=464), the model achieved Pearson r=0.990, R^2=0.981, RMSE=0.69 pg for Ret HE, and r=0.978, R^2=0.957, RMSE=0.66 pg for Delta HE. The three most important features for Ret HE prediction were Mean Corpuscular Volume (MCV) (43.4% relative importance), Mean Corpuscular Haemoglobin (MCH) (24.2%), and Mean Corpuscular Haemoglobin Concentration (MCHC) (10.5%), together accounting for 78.1% of total predictive weight.

Conclusion: Ret HE can be predicted from routine CBC with high accuracy using a random forest model driven primarily by red cell indices. The moderate external validation performance likely reflects population differences (iron-deficiency workup vs. unselected CBCs) and the absence of 13 CBC features in the validation dataset.

Keywords: Erythropoiesis, Haematology analyser, Reticulocyte mode.

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Paper Abstract No.: 04

Data-driven Laboratory Transformation: From Passive Reporting to Active Intelligence–Lessons from Analysis of 87,513 Complete Blood Count Records

TP KEERTTHANA[1], SHILPA GUPTA REDDY[2], VINODHINI ASHOKAN[3], ANIL REDDY KONDURU[4], M RAMYA[5], VIJAYASHREE RAGHAVAN[6]

ABSTRACT

Introduction: Modern haematology laboratories generate vast amounts of data through automated analysers and Laboratory Information Systems (LIS). However, much of this information remains underutilised, with laboratory practice largely focused on reporting individual test results rather than extracting actionable clinical and operational insights.

Materials and Methods: A retrospective analysis was performed on 87,513 Complete Blood Count (CBC) records generated between 2021 and 2026 at a tertiary care teaching hospital.

Results: Eight major gaps were identified: (1) lack of data standardisation and quality control, (2) underutilisation of QC data for process improvement, (3) non-reporting of clinically valuable parameters such as Mean Platelet Volume (MPV), Platelet Distribution Width (PDW), Platelet Large Cell Ratio (P-LCR), and Neutrophil-to-Lymphocyte Ratio (NLR), (4) absence of subgroup-specific analytics, (5) limited longitudinal patient tracking, (6) dependence on manual smear verification, (7) lack of predictive analytics, and (8) automated clinical decision support.

Conclusion: Significant untapped value exists within routinely generated haematology laboratory data. Strategic integration of data standardisation, smart reporting, longitudinal analytics, QC dashboards, and predictive models can transform laboratories from passive reporting centres into active intelligence hubs.

Keywords: Laboratory information system, Platelet distribution width, Predictive model.

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Paper Abstract No.: 05

LAG-3 as Potential Prognostic Marker: Correlating Expression Levels with Clinicopathological Parameters in Different Molecular Subtypes of Invasive Mammary Carcinoma

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ABSTRACT

Introduction: Invasive mammary carcinoma exhibits intense genetic and clinical heterogeneity, prompting evaluation of the Tumour Microenvironment (TME) to discover novel targets. Lymphocyte Activation Gene-3 (LAG-3) is an inhibitory immune checkpoint molecule on immune cells that prevents T-cell activation and impairs anti-tumour immune responses. Understanding LAG-3 distribution across molecular profiles is vital to advancing targeted immunotherapies.

Aim: To qualitatively and quantitatively evaluate stromal LAG-3 immunohistochemical expression in Tumour-Infiltrating Lymphocytes (TILs) across breast cancer molecular subtypes. To correlate LAG-3 expression with clinicopathological parameters and patient prognosis.

Materials and Methods: This retrospective study examined 100 histopathologically confirmed resection specimens of invasive mammary carcinoma collected between 2022 and 2025. Clinico-pathological parameters, including tumour size (pT stage), histological grade, axillary nodal status, Ki-67 labelling index, and molecular subtype, were retrieved from database records.

Results: LAG-3 expression was present in 43% of cases. Statistically significant associations were observed between LAG-3 positivity and higher histological tumor grade (Grade 3; p=0.00), an increased Ki-67 labelling index (p=0.049), and aggressive, immune-rich molecular variants—notably triple-negative (72.7%) and HER2-enriched breast carcinomas (p=0.00).

Conclusion: LAG-3 expression strictly functions as a distinctive feature of biologically aggressive breast malignancies.

Keywords: Lymphocyte activation gene, Tumour-infiltrating lymphocyte, Tumour microenvironment.

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Paper Abstract No.: 06

Comparative Evaluation of a Rule-based Engine and Random Forest Model for Automated Peripheral Smear Report Generation from Complete Blood Count Data

TP KEERTTHANA[1], SHILPA GUPTA REDDY[2], VINODHINI ASHOKAN[3], ANIL REDDY KONDURU[4], M RAMYA[5], VIJAYASHREE RAGHAVAN[6]

ABSTRACT

Introduction: Automated interpretation of Complete Blood Count (CBC) data for Peripheral Smear (PS) reporting can improve laboratory efficiency, consistency, and diagnostic standardisation. While rule-based systems provide transparent and deterministic outputs, machine learning approaches can identify complex relationships among haematological parameters. This study compares the performance and clinical applicability of both approaches using a large-scale haematology dataset.

Aim: To evaluate and compare a deterministic rule-based engine and a Random Forest (RF) model for automated PS report generation.

Materials and Methods: A retrospective analysis was performed on 87,244 CBC samples generated using Mindray haematology analysers, comprising 46,427 five-part and 40,817 six-part differential datasets. The rule-based system utilised over 25 expert-defined rules across Red Blood Cell (RBC), White Blood Cell (WBC), and Platelet (PLT) lineages.

Results: The rule-based engine achieved 100% coverage and generated interpretable outputs for all samples. Anaemia was identified in 47,087 (54.0%) cases, thrombocytopenia in 12,446 (14.3%), and WBC abnormalities in 23,077 (26.4%). Multi-lineage involvement occurred in 24,894 (28.5%) samples. The RF model achieved 95.2% overall accuracy.

Conclusion: A rule-based engine provides a robust and clinically reliable foundation for automated PS reporting. However, Artificial Intelligence (AI) models can enhance diagnostic refinement in borderline and complex cases.

Keywords: Artificial intelligence, Laboratory efficiency, Rule-based system.

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Paper Abstract No.: 07

Bacteriological Profile, Antimicrobial Susceptibility Pattern of Commonest Resistant Strain Isolated from Diabetic Foot Ulcer in a Tertiary Care Centre

AFREENA USMAN[1]

ABSTRACT

Introduction: Diabetic Foot Ulcers (DFUs) are a major cause of morbidity and mortality, with infection and antimicrobial resistance posing significant therapeutic challenges. Understanding the local bacteriological profile and resistance patterns is crucial for effective management.

Aim: To analyse the bacteriological profile and antimicrobial susceptibility patterns of isolates from DFU patients in a tertiary care centre.

Materials and Methods: A retrospective analysis of 123 DFU patients was conducted. Wound samples were processed for culture and antimicrobial susceptibility testing using standard microbiological techniques. Demographic, clinical, and laboratory data were extracted and analysed.

Results: The study population had a male predominance (63%) with a mean age in the 51-60 years group. Most patients (65%) had poor glycaemic control {Glycosylated haemoglobin (HbA1c 8%)}. Hypertension (84%) was the most common comorbidity. A total of 212 organisms were isolated from 123 patients, with Gram-negative bacilli predominating (76.9%). Pseudomonas aeruginosa was the most common isolate (26.88% of all organisms).

Conclusion: This study identifies P. aeruginosa as the most prevalent and highly resistant pathogen in DFUs, exhibiting alarming carbapenem resistance.

Keywords: Culture, Isolates, Resistance pattern.

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Paper Abstract No.: 08

A Correlation Study of Histopathological Examination with Pre-operative FNAC in Thyroid Swelling

MUMMIDI SRI RAMAKRISHNA[1]

ABSTRACT

Introduction: Thyroid swellings are the most common endocrine disorders encountered in clinical practice. Prevalence of thyroid nodules in the general population ranges from 4-7% on clinical examination. The present study aims to evaluate the diagnostic accuracy of preoperative Fine Needle Aspiration Cytology (FNAC) by correlating its findings with postoperative histopathological examination in patients with thyroid swelling.

Materials and Methods: This retrospective observational study collected data from patients undergoing thyroidectomy surgery in the Department of ENT and Head and Neck Surgery at Vels Medical College and Hospital, Manajarkarnai.

Results: A total of 32 cases were taken as the study population from the period of June 2025 to June 2026 with complaints related to neck swellings and thyroid pathologies, including goitres of varying sizes and durations. All these study participants underwent pre-operative FNAC and underwent Total Thyroidectomy and HPE was done postoperatively. The age of patients ranged from 20 to 65 years, with majority of cases being women.

Conclusion: FNAC is a simple, safe and reliable diagnostic tool for evaluation and demonstrates good diagnostic accuracy in differentiating benign from malignant lesions and plays an important role in preoperative assessment and treatment planning. However, combining FNAC with USG neck can improve preoperative planning.

Keywords: Fine needle aspiration cytology, Malignant lesion, Thyroid nodules.

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Paper Abstract No.: 09

WiFi Sense-Stroke-Guard: A Contactless Explainable AI Framework for Early Stroke Risk Stratification in Elderly Populations using WiFi Sensing and Longitudinal Health Monitoring

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ABSTRACT

Introduction: Stroke remains one of the leading causes of mortality and long-term disability worldwide, with elderly populations experiencing the highest burden of cerebrovascular disease. Current preventive approaches rely largely on periodic clinical assessments and wearable monitoring devices, both of which may fail to capture continuous physiological and behavioural changes that precede stroke-related deterioration.

Background: Existing monitoring pathways suffer from low adherence, discomfort, and cost among elderly and home-care populations, leaving critical gaps in early detection. WiFi sensing offers a low-cost, device-free alternative, inferring vitals and movement from ambient Channel State Information (CSI). Prior work has largely targeted isolated tasks such as fall detection, lacking a unified, interpretable stroke-risk pipeline — the gap this study addresses.

Methodology: A simulation-based feasibility study was structured across five stages: (1) synthetic elderly cohort generation calibrated to INTERSTROKE/GBD risk relationships; (2) WiFi CSI signal modelling to derive heart-rate, respiration, gait, mobility, sleep, and fall indicators via bandpass filtering, PCA, and Doppler-based motion decomposition; (3) fusion of WiFi-derived features with lifestyle and clinical history; (4) a Random Forest–XGBoost ensemble, tuned via grid search and validated with stratified k-fold cross-validation (AUC-ROC, sensitivity, specificity, F1); and (5) SHAP-based explainability for global and individualised risk interpretation.

Results: The framework reliably differentiated low- and high-risk synthetic profiles while preserving clinically interpretable feature attribution, confirming the technical feasibility of the proposed pipeline.

Conclusion: WiFiSense-Stroke Guard demonstrates the potential of contactless WiFi sensing combined with explainable AI for continuous stroke- risk surveillance and remote elderly care. Future work will pursue real-world validation, smart-home deployment, and telemedicine integration.

Keywords: WiFi Sensing, Stroke Prevention, Explainable Artificial Intelligence, Elderly Healthcare, Digital Health.

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Paper Abstract No.: 10

A Cross-sectional Observational Study of Prescription Pattern Analysis among Geriatric Patients in a Tertiary Care Centre

YUVASHREE SN[1]

ABSTRACT

Introduction: Geriatric patients commonly suffer from multiple chronic illnesses requiring long-term pharmacological therapy, resulting in increased prescription load and varied drug utilisation in this population. Evaluation of prescribing trends in this population is essential to promote rational and safe medication use in tertiary care settings.

Aim / Objectives: To analyse prescription patterns, prevalence of polypharmacy, and commonly prescribed therapeutic classes among geriatric patients attending the Department of General Medicine in a tertiary care Centre.

Materials and Methods: A cross-sectional observational study was conducted using prescription records of 150 geriatric patients (aged ≥65 years) from the Department of General Medicine. Data were extracted using a structured proforma and analysed using descriptive statistics, including mean, frequency and percentage distribution.

Results: A total of 150 study samples were analysed in the present study. The mean age of the study population was 71.39 years, with a male predominance comprising 82 males (54.7%) and 68 females (45.3%). The majority of patients were in the 65--70 (49.3%) years age group. The average number of drugs per prescription was 8, indicating a high prevalence of polypharmacy (66%) among the geriatric population.

Conclusion: This study demonstrates a high prevalence of polypharmacy among geriatric patients, predominantly driven by multimorbidity, with cardiovascular and gastrointestinal drugs as the leading contributors.

Keywords: Drug utilisation, Geriatrics, Prescription pattern, Polypharmacy.

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Paper Abstract No.: 11

Machine Learning-assisted Analysis of Indoor Air Pollution, Sleep Disturbance, and Anxiety Symptoms in Children with Autism Spectrum Disorder: A Pilot Cross-sectional Study

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ABSTRACT

Introduction: Children with Autism Spectrum Disorder (ASD) exhibit heightened neurobiological vulnerability to environmental stressors. Exposure to indoor particulate matter and elevated carbon dioxide has been implicated in neuroinflammatory pathways associated with sleep dysregulation and behavioural comorbidities; however, empirical data from South Asian paediatric ASD populations remain limited.

Materials and Methods: This pilot cross-sectional study enrolled 50 children aged 3--12 years with Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)- confirmed ASD from neurodevelopmental clinics in Chennai, India. Indoor air quality parameters were measured using calibrated DE-Wire Pollution Monitors during home visits.

Results: Mean $PM_{2.5}$ concentration was 67.3±26.6 µg/m^3, exceeding WHO guidelines in 84% of households. Children's Sleep

Habits Questionnaire (CSHQ) scores had a mean of 41.3±6.8, meeting the clinical disturbance threshold in 52% of participants. SCARED identified probable anxiety in 44% of participants, with Panic/Somatic symptoms being the most prevalent (50%; n=25), followed by Separation Anxiety (38%). $PM_{2.5}$ was significantly correlated with CSHQ scores (r=0.61, p<0.01).

Conclusion: Indoor air pollution was significantly associated with sleep disturbance and anxiety symptoms among children with ASD and may represent a modifiable environmental risk factor.

Keywords: Anxiety, Carbon dioxide, Machine learning.

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Paper Abstract No.: 12

Demographic Status of Nasal Foreign Bodies in Paediatric Age Group in a Tertiary Care Centre

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ABSTRACT

Aim: To study the demographic profile, clinical presentation, management, and outcomes of nasal foreign bodies in the paediatric age group presenting to a tertiary care centre.

Materials and Methods: A record-based descriptive study was carried out at Vels Medical College and Hospital between February 2025 and February 2026.

Results: Among the 130 patients, 61.5% were boys and 38.5% were girls, with the majority belonging to the 2-5 years age group. Organic foreign bodies were more common than inorganic foreign bodies, with seeds being the most frequently encountered foreign body, followed by toy fragments.

Conclusion: Nasal foreign bodies are most commonly seen in children below 5 years of age, particularly in boys. Organic foreign bodies are more frequently encountered, and early diagnosis with prompt removal helps prevent complications such as foul-smelling discharge, epistaxis, and nasal obstruction.

Keywords: Epistaxis, Organic foreign bodies, Nasal obstruction.

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Paper Abstract No.: 13

Machine Learning Based Prediction of Multidrug Resistance among Staphylococci in Skin and Soft Tissue Infections: A Pilot Clinical and Phenotypic Analysis

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ABSTRACT

Introduction: Staphylococci are predominant pathogens in Skin and Soft Tissue Infections (SSTIs) exhibiting resistance to most classes of antimicrobials used in therapy, highlighting the need for continuous surveillance.

Aim and Objective: To develop and evaluate machine learning (ML) models for predicting antimicrobial resistance among Staphylococci isolated from SSTIs.

Methods: A retrospective pilot study was conducted at a tertiary care centre, Tiruvallur. Clinical and microbiological data from 65 SSTI patients (38 males, 27 females; mean age 36.9±17.6 years) were analysed. Machine learning algorithms like Random Forest (RF), Multilayer Perceptron (MLP) and Convolutional Neural Network (CNN) architecture were evaluated.

Results: Staphylococcus aureus accounted for 89.2% (58/65) and coagulase negative Staphylococci (CoNS) accounted for 10.8% (7/65). Multi drug resistance (MDR) was detected in 55.4% (36/65) isolates. Among ML models, MLP achieved the highest accuracy of 92.6% and F1 score of 93.5% (AUC: 0.925; sensitivity: 95.0%; specificity: 90.0%).

Conclusion: ML models like MLP, demonstrated strong preliminary proof of concept, supporting their integration into antimicrobial stewardship programmes, enabling timely, evidence based treatment decisions.

Keywords: Staphylococcus aureus, skin and soft tissue infections, antimicrobial resistance, multidrug resistance, machine learning, Multilayer Perceptron.

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Paper Abstract No.: 14

AI-integrated Biofeedback and Sensor-based Technologies in Pelvic Floor Physiotherapy following Obstetric Trauma: A Scoping Review

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ABSTRACT

Introduction: Pelvic floor dysfunction following obstetric trauma, including Urinary incontinence, pelvic organ prolapse, and diminished pelvic floor muscle contractility, affects a significant proportion of postpartum women worldwide. Electromyography biofeedback, intravaginal pressure sensors, accelerometer-based rehabilitation devices, and artificial intelligence-driven adherence monitoring systems are increasingly incorporated into postpartum pelvic floor rehabilitation. Despite growing adoption, no synthesis exists that maps the scope, clinical application, and outcome evidence of these technologies within obstetric physiotherapy practice.

Aim: To map the scope, typology, clinical outcomes, and implementation frameworks of Artificial Intelligence (AI)-integrated biofeedback and sensor-based technologies applied to pelvic floor rehabilitation following obstetric trauma.

Materials and Methods: This scoping review will be conducted following the Joanna Briggs Institute methodological framework and reported using the PRISMA-ScR checklist. A structured search will

be performed across PubMed/MEDLINE, Scopus, Web of Science, and Google Scholar from 2015 to 2026.

Results: Preliminary mapping identifies heterogeneity in device types, clinical populations, and outcome domains. Documented modalities include mobile applications paired with intravaginal biofeedback devices, AI-driven exercise adherence platforms, and sensor-embedded pelvic floor training systems.

Conclusion: AI-integrated and sensor-based technologies represent an expanding area in obstetric pelvic floor physiotherapy. This scoping review will produce a structured evidence map to support clinical translation, practice guideline development, and identification of research priorities in this domain.

Keywords: Artificial intelligence, Implementation framework, Sensor technology.

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Paper Abstract No.: 15

Study to Determine the Association between Cerebroplacental Ratio at Term and Adverse Obstetric and Neonatal Outcomes: A Cohort Study

M DEVIBALA DIVYA[1]

ABSTRACT

Introduction: Foetoplacental Doppler ultrasonography is one of the most widely used non-invasive methods for foetal surveillance, alongside cardiotocography. The Cerebroplacental Ratio (CPR) is an important Doppler parameter that may help identify foetuses at increased risk of adverse obstetric and neonatal outcomes.

Aim: To determine the association between the CPR at term and adverse obstetric and neonatal outcomes.

Materials and Methods: A total of 84 patients were recruited and divided into two groups based on the CPR: 42 patients with CPR >1 (normal CPR group) and 42 patients with CPR <1 (abnormal CPR group). Obstetric and neonatal outcomes were compared between the two groups.

Results: A statistically significant difference was observed in the mode of delivery between the normal and abnormal CPR groups. In the normal CPR group, all 42 patients had a reactive Non-Stress Test (NST). In the abnormal CPR group, 31 patients had a reactive NST, whereas 11 had a non-reactive NST. The difference in NST findings between the two groups was statistically significant.

Conclusion: An abnormal CPR at term was associated with a higher frequency of operative vaginal deliveries and caesarean sections. However, birth weight was comparable between the normal and abnormal CPR groups. These findings suggest that CPR may have clinical utility in identifying pregnancies at increased risk of adverse intrapartum outcomes.

Keywords: Birthweight, Foetoplacental Doppler ultrasonography, Non stress test.

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Paper Abstract No.: 16

Physiotherapy Education and AI Readiness: A Systematic Literature Review of Competency Frameworks Reveals a Critical Evidence Gap

SARIKA MAURYA[1,2], ALKA RAWEKAR[3]

ABSTRACT

Introduction: Artificial Intelligence (AI)-driven diagnostics, clinical decision support systems, and data-driven rehabilitation tools are entering physiotherapy practice at a pace that education systems have not kept up with. Whether published evidence on physiotherapy competency frameworks and curriculum design addresses AI readiness as a graduate outcome has not been examined.

Aim: To systematically map published evidence on competency frameworks and curriculum structures in physiotherapy education, identifying domains relevant to AI-ready clinical practice and gaps that need attention.

Materials and Methods: A PRISMA-guided systematic literature review was conducted across PubMed, Scopus, Web of Science, and Google Scholar, covering 2000 to 2024. Search terms addressed physiotherapy curriculum, competency-based education, evidence-based practice integration, and clinical reasoning.

Results: Included studies consistently identified clinical reasoning, evidence-based practice, research integration, and interprofessional competence as core curriculum domains. No study explicitly addressed AI readiness as a curriculum outcome or mapped graduate competencies to the demands of AI-augmented clinical environments.

Conclusion: Physiotherapy education research has not addressed AI readiness as a curriculum priority. Graduates are entering AI-augmented clinical environments without frameworks to guide their preparation.

Keywords: AI readiness, Clinical decision support, Systematic review.

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Paper Abstract No.: 17

Curriculum Quality as an AI Implementation Problem: A Six-country Comparative Analysis and Enhancement Framework for Physiotherapy Education

SARIKA MAURYA[1,2], ALKA RAWEKAR[3]

ABSTRACT

Introduction: Using Artificial Intelligence (AI) tools in physiotherapy practice with graduates who lack strong clinical reasoning and research literacy does not improve care; it produces unverified outputs and creates patient safety risks. Curriculum quality is therefore part of the AI implementation problem, not a separate education policy matter.

Aim: To compare the Indian MoHFW competency-based physiotherapy curriculum against entry- level curricula from Australia, Canada, the United States, the United Kingdom, and New Zealand, focusing on domains relevant to AI-ready clinical practice, and to develop an evidence-based curriculum enhancement framework.

Materials and Methods: A qualitative comparative document analysis was conducted using official curriculum frameworks,

competency standards, and accreditation documents from six countries. Seven domains were analysed: programme structure, competency articulation, teaching methodology, clinical education, research and evidence-based practice integration, assessment approaches, and licensure.

Results: The Indian curriculum showed broad alignment with competency-based principles but significant gaps relative to all five comparator countries in research literacy, progressive clinical reasoning development, and assessment authenticity. These are the same competencies that determine whether a graduate can critically evaluate AI-generated clinical outputs.

Conclusion: Introducing AI tools into physiotherapy practice without fixing curriculum gaps puts the sophistication of the tool ahead of the readiness of the person using it. The CAEF provides a practical, evidence-based plan for India to address this, so that curriculum improvement and AI integration move forward together.

Keywords: AI-augmented practice, Comparative education, Curriculum reform, Patient safety, Physiotherapy curriculum.

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Paper Abstract No.: 18

Two-stage Clinical Anomaly and Ensemble Classifier with Prognostic Marrow-Inflammatory Axis (CMIA) for Thrombocytopenia

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ABSTRACT

Introduction: Thrombocytopenia affects up to 25% of clinical patients and presents a major diagnostic challenge in differentiating hyperdestructive peripheral platelet consumption from hypoproductive bone marrow suppression. Conventional machine learning approaches frequently rely on Synthetic Minority Oversampling Technique (SMOTE) to address class imbalance, potentially generating biologically unrealistic patient profiles. This study proposes a SMOTE-free, two-stage clinical architecture integrated with Laboratory Information Systems (LIS) using raw haematological indices generated by the Mindray BC-6000 analyser. In addition, a novel Prognostic Cross Marrow-Inflammatory Axis (CMIA) was developed to identify mortality risk based on systemic inflammatory burden and marrow regenerative capacity.

Aim: To develop and validate a SMOTE-free, explainable machine learning framework for accurate etiological classification of thrombocytopenia and to evaluate the prognostic utility of the Cross Marrow-Inflammatory Axis (CMIA) for patient risk stratification.

Materials and Methods: A total of 41,039 Complete Blood Count (CBC) records, including 4,138 thrombocytopenia cases, were analysed. The proposed two-stage pipeline first utilised analyser EDTA clumping flags and Isolation Forest anomaly detection to identify pseudothrombocytopenia. In the second stage, severe class imbalance between hyperdestructive (n=3,808) and hypoproductive (n=293) thrombocytopenia was addressed using an under-sampled ensemble of 10 machine learning models. Model performance was evaluated using 5-fold stratified cross-validation, and SHapley Additive exPlanations (SHAP) analysis was employed to determine feature importance.

Results: The Gradient Boosting Ensemble achieved the best overall performance, with a validation accuracy of 95.29% and a Cohen's Kappa of 0.7323. The model demonstrated a 96.20% sensitivity for identifying hypoproductive thrombocytopenia, minimising missed bone marrow failure cases. SHAP analysis identified Platelet Large Cell Ratio (P-LCR) and Mean Platelet Volume (MPV) as the most influential features for etiological classification. The novel CMIA score successfully stratified patients into prognostic risk categories, with high-risk patients exhibiting markedly reduced marrow regenerative capacity and severe systemic inflammation (mean neutrophil-to-lymphocyte ratio: 8.85).

Conclusion: Operating entirely on unaltered clinical data, this SMOTE-free framework preserves biological fidelity while maintaining high diagnostic performance. By accurately distinguishing hyperdestructive from hypoproductive thrombocytopenia and identifying high-risk patients, the proposed pipeline provides a reliable, non-invasive LIS-based screening tool with the potential to reduce unnecessary bone marrow biopsies and improve clinical decision-making.

Keywords: Bone marrow failure, Laboratory information system, Machine learning, Explainable Artificial Intelligence, Thrombocytopenia.

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Paper Abstract No.: 19

Clinical Profile and Etiological Factors of Hypokalaemia in Patients with Renal Failure: A Retrospective Hospital-based Study Protocol

SIVARAMKRISHNAN K[1]

ABSTRACT

Introduction: Hypokalaemia (serum potassium <3.0 mEq/L) is a common electrolyte abnormality in patients with renal failure and is associated with adverse outcomes, including arrhythmias, prolonged hospitalisation, and progression of renal dysfunction. Data on its prevalence and etiological factors among Indian patients with renal failure are limited.

Aim: To identify the aetiological factors associated with hypokalaemia in patients with renal failure. Secondary objectives include determining its prevalence, evaluating demographic and clinical characteristics, assessing the association of medications, comorbidities, and laboratory parameters, and describing clinical outcomes.

Need of the Study: The study will determine the prevalence of hypokalemia and identify its major etiological factors, while evaluating associations with demographic characteristics, comorbidities, medication use, dialysis requirement, duration of hospitalisation, ICU admission, and in-hospital mortality.

Materials and Methods: A retrospective observational study will be conducted in the Department of Medicine using hospital records of adult patients admitted between January 2023 and December 2025. Patients aged ≥18 years with renal failure, serum creatinine >1.7 mg/dL, serum potassium <3.0 mEq/L, and complete medical records will be included. Data on demographics, clinical characteristics, laboratory parameters, medication history, dialysis status, and outcomes will be collected. Statistical analysis will be performed using SPSS version 26, with multivariate logistic regression used to identify independent predictors of hypokalemia. A p-value <0.05 will be considered statistically significant.

Conclusion: The study is expected to identify modifiable risk factors associated with hypokalemia in renal failure, facilitating early recognition and targeted management. The findings may improve monitoring of electrolyte disturbances and help reduce complications, morbidity, and adverse clinical outcomes.

Keywords: Acute kidney injury, Chronic kidney disease, Electrolyte disorders.

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Paper Abstract No.: 20

A Cross-sectional Study of Knowledge and Attitude and Practices of Hand Hygiene among Nursing Student in Tertiary Health Care Centre in Tiruvallur District

PANDIAN P[1], SATHISH DEV[2]

ABSTRACT

Introduction: Healthcare-associated infections remain a major patient safety concern, and hand hygiene is one of the most effective, low-cost measures to prevent their transmission. Nursing students, as future frontline healthcare workers, need adequate knowledge, positive attitudes, and consistent practice of hand hygiene, yet this group remains understudied compared to practicingnurses and doctors.

Materials and Methods: A descriptive cross-sectional study was conducted among nursing students from a tertiary centre in Tiruvallur district. Data were collected using a self-administered questionnaire that included questions related to the Knowledge, Attitude, and Practice (KAP) of hand hygiene among the participants.

Results: Among the participants, 99% were familiar with the WHO-recommended steps of hand washing. Overall, 84% of the students had moderate knowledge regarding hand hygiene. However, only 24% correctly knew that the minimum time required for alcohol-based hand rub is 20 seconds. A positive attitude towards hand hygiene was observed in 90% of the participants.

Conclusion: Most nursing students had a moderate level of knowledge about hand hygiene. They also showed positive attitudes and generally followed good hand hygiene practices. They understood that hand hygiene is very important in nursing to prevent the spread of infection and protect patients.

Keywords: Hand rub, Positive attitude, Questionnaire.

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Paper Abstract No.: 21

A Cross-sectional Study to Assess Knowledge and Practice Regarding Menstrual Hygiene and Sanitary Pad Usage, its Alternatives and Disposal Practice among Allied Health and Nursing Students Studying in a Tertiary Care Hospital in Tiruvallur District

DELIA THANGAM SAJAN[1]

ABSTRACT

Introduction: Proper menstrual hygiene management is important for preventing reproductive tract infections and ensuring student well- being. Students in allied health and nursing fields serve as future health educators, making their personal health awareness and practice highly important for community health education.

Aim: To assess the knowledge regarding menstruation and menstrual hygiene among students. To determine awareness and use of alternative menstrual products among students.

Materials and Methods: A cross-sectional, descriptive study was conducted among female undergraduate students from the allied health and nursing streams at a tertiary care institution in Tiruvallur.

Results: Most participants primarily used commercial sanitary pads. While many were aware that menstruation is a physiological process, their practices varied; some students reported wearing a single pad for over six hours during heavy flow. Awareness of menstrual cups existed, but few used them regularly due to concerns like insertion anxiety and limited practical experience.

Conclusion: Although knowledge of menstrual health is satisfactory among these future healthcare providers in Tiruvallur, significant gaps persist regarding prolonged pad usage, safe, eco-friendly disposal, and the adoption of sustainable alternatives.

Keywords: Medical students, Menstrual cups, Waste disposal.

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Paper Abstract No.: 22

Age- and Gender-specific Reference Intervals and Morphological Patterns of Anaemia: A Big Data Analysis of 38,006 Patients in a South Indian Tertiary Care Center

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ABSTRACT

Introduction: Anemia remains a major public health challenge worldwide, affecting nearly 1.9 billion people and contributing significantly to morbidity and reduced quality of life. Most haematological reference intervals currently used in clinical practice are derived from Western populations and may not accurately reflect regional variations.

Materials and Methods: A retrospective big-data analysis was conducted using complete blood count (CBC) records from the Department of Pathology, Vels Medical College and Hospital, Chennai. Data from March 2022 to February 2026 were extracted from automated 5-part and 6-part haematology analysers. After data cleaning and exclusion of implausible values, 38,006 patient records were analysed.

Results: The overall prevalence of anaemia was 51.6% (19,616/38,006), indicating a severe public health problem according to the World Health Organisation (WHO) criteria. Prevalence was significantly higher among females (60.7%) than males (39.1%). Age-specific analysis demonstrated a U-shaped pattern in males and consistently high prevalence among females across reproductive age groups.

Conclusion: Anaemia affects more than half of patients in this South Indian tertiary care population, with women bearing a disproportionate burden. The predominance of normocytic anemia suggests chronic disease as a major contributor.

Keywords: Haematology, Morbidity, U-shaped pattern.

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Paper Abstract No.: 23

From Engagement Gap to Digital Readiness: A Needs Assessment for Digital Case-based Learning to Strengthen Clinical Reasoning in Community Medicine

D SUNIL KUMAR[1]

ABSTRACT

Introduction: Clinical reasoning is essential for competency-based Community Medicine training, yet learners often struggle to connect classroom knowledge with clinical postings and field realities. Digital Case-Based Learning (DCBL) may bridge this gap through authentic, interactive public health scenarios.

Aim: To assess clinical reasoning confidence, current teaching engagement, preferred learning approaches, digital readiness, barriers, and interest in adopting DCBL.

Materials and Methods: A cross-sectional needs assessment was conducted among 1,010 medical learners and faculty from multiple medical institutions in India. A structured questionnaire assessed confidence, engagement, prior digital case exposure, learning preferences, device use, barriers, and DCBL interest.

Results: Most participants were MBBS Phase 3 Part 1 students. Mean clinical reasoning confidence was moderate (3.21±0.82), while DCBL interest was higher (3.53±0.96), with 49.7% reporting high/very high interest. DCBL interest was significantly associated with current teaching engagement and showed the largest effect size ($H=66.083$, $p=0.001$, $\eta^2=0.062$).

Conclusion: The findings demonstrate educational readiness for DCBL. A mobile- responsive, pedagogically engaging DCBL model may strengthen clinical reasoning and support competency-based Community Medicine learning.

Keywords: Clinical reasoning; Community Medicine; Digital case-based learning; Medical education.

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Paper Abstract No.: 24

Prevalence of Sensorineural Hearing Loss in Patients with Type 2 Diabetes Mellitus: A Retrospective Observational Study

K USHA KIRAN[1]

ABSTRACT

Introduction: Diabetes mellitus is a common metabolic disorder associated with microvascular and neuropathic complications. Increasing evidence suggests that the auditory system may also be affected, resulting in sensorineural hearing loss (SNHL). Early detection of hearing impairment in diabetic patients is important to improve quality of life and prevent progression.

Aim/Objectives: To determine the prevalence and pattern of sensorineural hearing loss among patients with type 2 diabetes mellitus and to evaluate its association with glycemic control.

Materials and Methods: A retrospective observational study was conducted in a tertiary care teaching hospital. Medical records of 105 patients with type 2 diabetes mellitus who underwent audiological evaluation were reviewed. Demographic data, duration of diabetes, HbA1c levels, associated comorbidities, and pure-tone audiometry findings were analysed.

Results: The study demonstrated a high prevalence of sensorineural hearing loss among diabetic patients. Hearing impairment was predominantly bilateral and involved the higher frequencies. The severity of hearing loss ranged from mild to profound, with

mild-to-moderate SNHL being the most frequently observed pattern.

Conclusion: Sensorineural hearing loss is a common yet often overlooked complication of type 2 diabetes mellitus. Poor glycemic control and prolonged disease duration appear to increase the risk of auditory dysfunction.

Keywords: Hearing impairment, High-frequency audiometry, Pure-tone audiometry.

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Paper Abstract No.: 25

Comparative Evaluation of ChatGPT, Claude, and Gemini in the Assessment of Hypertrophic Lichen Planus

DIKSHA TIWARI[1]

ABSTRACT

Introduction: Artificial intelligence models with multimodal vision capabilities are increasingly being tested for clinical decision support in dermatology. However, most evaluations rely on a single imaging modality and rarely validate Artificial Intelligence (AI) outputs against actual histopathology.

Aim: To compare the diagnostic reasoning of three AI models across gross clinical photography and dermoscopy in a case of Hypertrophic Lichen Planus (HLP), assess whether dermoscopy provided incremental value to AI over gross photography alone, and validate AI histopathological predictions against the confirmed biopsy report.

Materials and Methods: A 36-year-old man (Fitzpatrick V) with a 1.5-year history of pruritic pretibial hyperkeratotic lesions was evaluated.

Results: In Phase 1, all three models identified HLP as the leading diagnosis (confidence 62--80%). In Phase 2 (dermoscopy alone), models diverged substantially—one retained HLP, one shifted to psoriasis, one to lichen simplex chronicus—demonstrating that dermoscopy did not consistently improve AI reasoning. In Phase 3, two models returned to HLP while one shifted to prurigo nodularis.

Conclusion: ChatGPT, Claude, and Gemini demonstrated a high degree of concordance in placing hypertrophic lichen planus within the correct diagnostic family, supported by histopathology.

Keywords: Dermoscopy, Large language models, Multimodal vision.

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Paper Abstract No.: 26

Awareness and Attitude towards Virtual Autopsy (Virtopsy) among Medical Students

VISHALI DHANASEKAR[1]

ABSTRACT

Introduction: Virtual autopsy (Virtopsy) is a modern, non-invasive post-mortem examination technique that utilises advanced imaging modalities such as Computed Tomography (CT), Magnetic Resonance Imaging (MRI), and three-dimensional reconstruction. It serves as an adjunct or alternative to conventional autopsy

in selected forensic cases. As medical technology advances, awareness of virtual autopsy among future healthcare professionals becomes increasingly important.

Aim: To assess the awareness and to evaluate their knowledge regarding the applications, advantages, limitations and the use of imaging techniques in virtual autopsy among medical students.

Materials and Methods: A cross-sectional study was conducted among undergraduate medical students. A pre- validated structured questionnaire containing demographic details and questions related to virtual autopsy was distributed electronically. Data were collected and analysed using descriptive statistics. The results were expressed as frequencies and percentages.

Conclusion: The study revealed a moderate level of awareness regarding virtual autopsy among medical students. Although many participants were familiar with the basic concept, significant knowledge gaps were identified concerning its applications and limitations.

Keywords: Attitude, Awareness, Medical, virtual autopsy.

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Paper Abstract No.: 27

Study of Hyponatraemia in Seriously Ill Patients and Outcomes

BEERE HINDU KUMAR[1]

ABSTRACT

Introduction: Hyponatraemia is a common electrolyte abnormality seen in seriously ill patients. Studies conducted on critically ill patients in the Intensive Care Unit (ICU) have demonstrated that hyponatraemia is associated with prolonged ICU stay, increased requirement of ventilatory support, and elevated mortality rates. Given its clinical significance, understanding the impact of hyponatraemia on patient outcomes in seriously ill patients remains an important area of investigation.

Aim: To assess the effect of hyponatremia on outcome variables—specifically mortality and duration of hospital stay—in seriously ill patients admitted to the hospital.

Materials and Methods: A comparative observational study was conducted on 100 seriously ill patients, divided into two groups: those with hyponatraemia and those without hyponatraemia. Outcome variables, including mortality and duration of hospital stay, were assessed and compared between the two groups. Data were analysed using SPSS version 25.

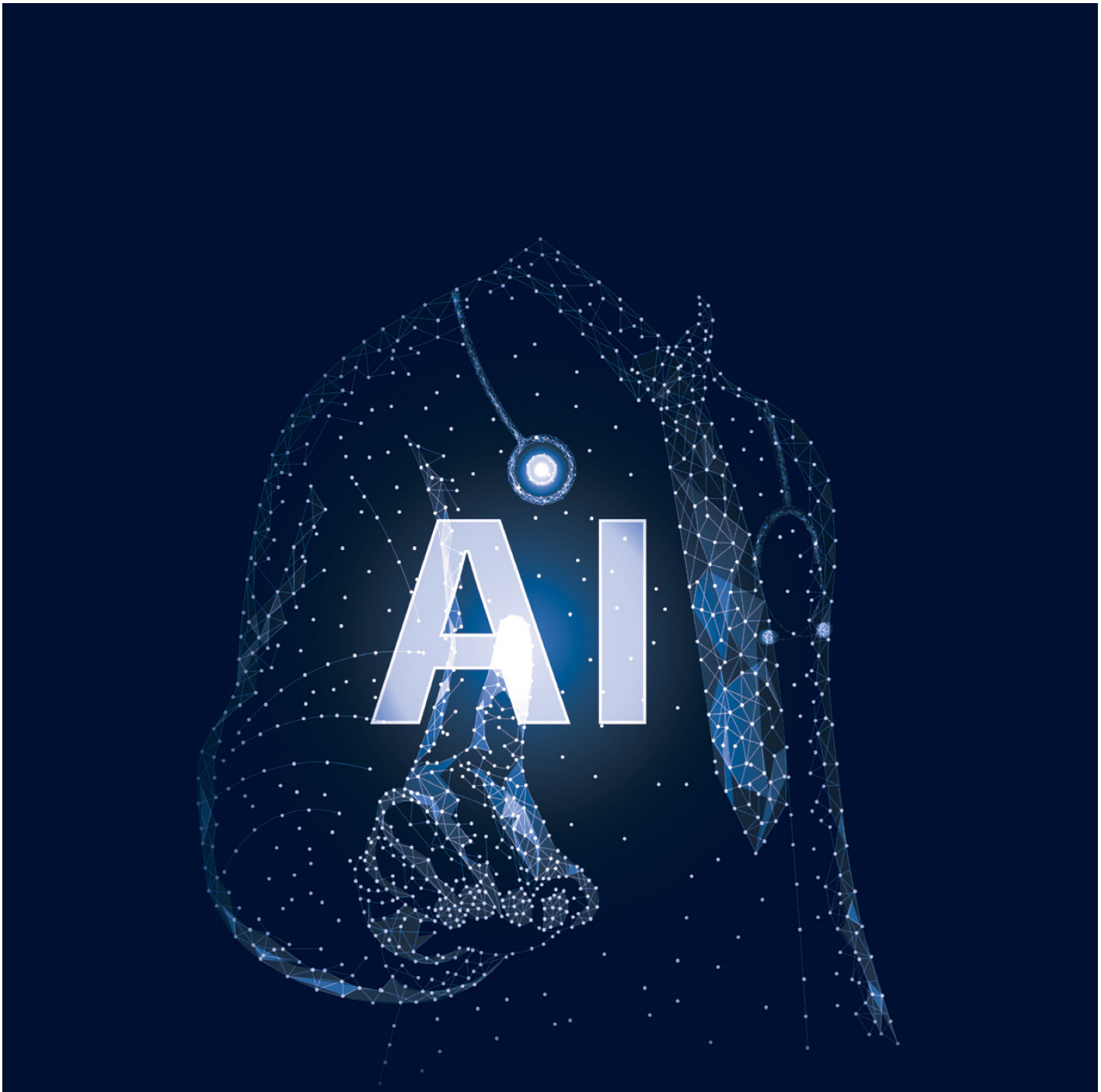
Results: Mortality was observed in 53.6% of patients with hyponatraemia compared to 36.7% of patients without hyponatraemia, with a statistically significant p-value of 0.0001. Increasing severity of hyponatraemia was associated with a higher risk of mortality (p=0.0001). No significant association was found between the type of hyponatraemia and mortality.

Conclusion: Hyponatraemia in seriously ill patients is significantly associated with increased mortality. This study underscores the clinical importance of recognising and managing hyponatraemia in critically ill patients to potentially improve survival outcomes.

Keywords: Electrolyte abnormality, Hyponatraemia, Intensive Care Unit (ICU), Mortality, Seriously ill patients.

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Abstracts of Posters in MED-AI

Poster Abstract No.: 01

Sepsis and nRBC Severity Prediction from Routine Complete Blood Count Parameters: An Ensemble Machine Learning Approach on Mindray BC-6000

ADITI KUMARI[1], RAMYA M[2], HEMASHREE[3], GEETHAPRIYA G[4], VIJAYASHREE RAGHAVAN[5], ANIL REDDY[6]

ABSTRACT

Introduction: Immature Granulocytes (IG) and Nucleated Red Blood Cells (NRBCs) are important biomarkers of sepsis and disease severity, but many laboratories lack advanced analysers capable of directly reporting these parameters. This study aimed to develop a machine learning model that predicts sepsis risk and NRBC severity using routine Complete Blood Count (CBC) parameters generated by the Mindray BC-6000 analyser.

Materials and Methods: A retrospective dataset of approximately 87,500 clinical samples was analysed. Sepsis risk and NRBC severity labels were derived from validated clinical thresholds. Multiple routine CBC parameters, including white blood cell differentials, red blood cell indices, platelet parameters, and derived clinical flags, were used as predictors.

Results: The ensemble model demonstrated strong predictive performance, achieving balanced accuracy values of 0.861 for sepsis risk prediction and 0.916 for NRBC severity classification. An out-of-distribution detection module enhanced model safety by identifying atypical samples. Longitudinal patient tracking further enabled monitoring of changes in sepsis risk over time.

Conclusion: Routine CBC parameters can be effectively used to predict sepsis risk and NRBC severity without requiring dedicated IG/NRBC measurement channels.

Keywords: Disease severity, Nucleated red blood cells, Predictive performance.

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Poster Abstract No.: 02

From Textbook to Interactive Tool in Hours: A RAG-augmented, LLM-coded, Zero-infrastructure Pathology Learning System

SANJANIKA S[1], VINODHINI ASOKAN[2], SHILPA GUPTA[3], ASFIA SHABNAM[4], ANIL REDDY[5], VIJAYASHREE RAGHAVAN[6]

ABSTRACT

Introduction: Teaching pathology topics such as Male Genital Tract (MGT) pathology is challenging due to their complexity, extensive classifications, and reliance on visual learning. Conventional slide-based teaching often lacks interactivity, active recall mechanisms, and accessibility in low-resource settings.

Materials and Methods: Content from the Male Genital Tract chapter of Robbins Basic Pathology served as the primary knowledge corpus. Relevant textbook sections were manually retrieved and supplied to GPT-4 and Claude through structured prompts to generate curriculum-aligned educational content, including MCQs, flashcards, mnemonics, and interactive HTML applications.

Results: Within approximately 40 hours of development and over 200 iterative prompts, two production-ready tools were created with a combined size of ~155 KB. The lecture module incorporated 13 curriculum-aligned slides and 12 interactive features, while the assessment module included 40 MCQs, 52 flashcards, mnemonics, comparison tables, and rapid-fire quizzes.

Conclusion: This proof-of-concept demonstrates that a single educator can leverage textbook-grounded RAG workflows and LLM-assisted coding to rapidly develop high-quality, interactive educational tools for pathology.

Keywords: Large language model, Male genital tract, Retrieval-augmented generation.

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Poster Abstract No.: 03

From Bench to Boardroom: Data-driven Decision Making in Haematology Laboratories

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ABSTRACT

Introduction: Modern clinical laboratories generate large volumes of operational and quality data; however, much of this information remains underutilised for decision-making. Accreditation standards such as NABL ISO 15189 emphasise evidence-based quality management, creating a need for practical laboratory analytics frameworks that can transform routine data into actionable insights.

Materials and Methods: A retrospective analysis of haematology laboratory operations was performed using four months of laboratory data (January--April 2026), encompassing approximately 136,000 tests and 1,110 Turnaround Time (TAT) records.

Results: A total of 136,074 laboratory tests were performed, with haematology tests accounting for 97,303 investigations. Complete Blood Count (CBC) testing represented 96.2% of all haematology requests, demonstrating substantial test concentration and opportunities for panel standardisation.

Conclusion: Routine laboratory operational data can provide valuable insights for strategic management and quality improvement.

Keywords: Accreditation standards, Panel standardisation, Quality improvement.

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Poster Abstract No.: 04

Comprehensive Clinical Decision Support using Derived Haematological Indices from Routine CBC Parameters

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ABSTRACT

Introduction: The Complete Blood Count (CBC) is one of the most frequently ordered laboratory investigations and contains substantial diagnostic and prognostic information beyond conventional reporting parameters. Derived haematological indices can provide valuable insights into inflammation, anaemia differentiation, thrombotic risk, and disease severity without additional laboratory testing.

Materials and Methods: A total of 821 clinical samples were analysed using an automated computational platform capable of generating more than 18 derived haematological indices across four major clinical domains: inflammatory assessment, anaemia differentiation, thrombotic risk evaluation, and prognostic scoring.

Results: The system generated all indices in less than one second with minimal computational error risk (<0.1%). Elevated D-dimer proxy values were identified in 34.2% of samples, while severity scoring models correctly isolated 12.3% of critical cases. Among microcytic anaemia cases (17.9% of the cohort), automated anaemia differentiation panels facilitated discrimination between iron deficiency anaemia and thalassemia.

Conclusion: Automated generation of derived haematological indices from routine CBC parameters effectively transforms raw laboratory data into actionable clinical intelligence.

Keywords: Anaemia differentiation, Complete blood count, Inflammatory assessment.

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Poster Abstract No.: 05

Automated Differentiation of Thalassemia Trait from Iron Deficiency Anaemia using Eight Discriminant Indices with Probability Consensus

ADHITYA DAS[1], SHILPA GUPTA[2], KEERTHANA[3], RAJESH KUMAR[4], ANIL REDDY[5], VIJAYSHREE RAGHAVAN[6]

ABSTRACT

Introduction: Thalassemia trait and Iron Deficiency Anaemia (IDA) are the two most common causes of microcytic hypochromic anaemia and often present with similar haematological findings. Despite requiring fundamentally different management strategies, differentiation frequently relies on confirmatory investigations such as haemoglobin electrophoresis, High-Performance Liquid Chromatography (HPLC), or iron studies, which may be costly or inaccessible in resource-limited settings.

Materials and Methods: A retrospective analysis was performed on 821 CBC samples, of which 147 (17.9%) demonstrated microcytosis {Mean Corpuscular Volume (MCV <80 fL)}. Eight established discriminant indices—Mentzer, Siri, Englezos, Ricerca, Green and King, Shal, Srivastava, and D&F—were automatically calculated using CBC-derived parameters.

Results: Among the study population, 62.9% were anaemic (Hb <13 g/dL), while 13.5% had severe anaemia. The consensus model demonstrated improved diagnostic performance compared with individual indices by reducing classification uncertainty and minimising arithmetic errors associated with manual calculations.

Conclusion: Automated computation of multiple discriminant indices combined with probability consensus offers a robust, rapid, and reproducible method for differentiating thalassemia trait from iron deficiency anaemia using routine CBC data.

Keywords: Diagnostic performance, High-performance liquid chromatography, Mean Corpuscular Volume.

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Poster Abstract No.: 06

Darier's Disease with Oral Mucosal Involvement and Associated Seizure Disorder: A Rare Multisystem Presentation

AKSHAYA[1], VINODHINI ASOKAN[2], SHILPA GUPTA[3], G GEETHA PRIYA[4], ANIL REDDY[5], VIJAYASHREE RAGHAVAN[6]

ABSTRACT

Introduction: Darier's disease (keratosis follicularis) is a rare autosomal dominant genodermatosis caused by mutations in the *ATP2A2* gene, resulting in abnormal keratinisation and acantholysis. It is characterised by hyperkeratotic papules predominantly involving seborrheic areas, nail abnormalities, and occasional mucosal involvement. Increasing evidence also suggests an association between Darier's disease and neurological disorders, including epilepsy.

Materials and Methods: A 23-year-old female with a known diagnosis of Darier's disease since the age of 12 years presented with progressively increasing pruritic lesions over the inframammary, intermammary, bilateral inguinal regions, and posterior trunk. She had a history of seizure disorder since six months of age and was on clobazam and levetiracetam. Detailed dermatological, oral, and nail examinations were performed to document the clinical manifestations.

Results: Examination revealed multiple bilateral symmetrical, well-defined, keratotic, flat-topped brown papules distributed in a seborrheic pattern. Oral examination demonstrated multiple whitish papules over the palate, gingiva, buccal mucosa, and tongue. Nail examination showed longitudinal red and white streaks, V-shaped distal nicking, and subungual hyperkeratosis. The coexistence of characteristic cutaneous, mucosal, and nail findings with longstanding epilepsy supported the diagnosis of classical Darier's disease with oral mucosal involvement and neurological association.

Conclusion: This case highlights the multisystem nature of Darier's disease and emphasises the importance of comprehensive mucocutaneous examination, including oral and nail assessment. Recognition of associated neurological comorbidities such as epilepsy is essential for holistic patient management. Early diagnosis, treatment adherence, and multidisciplinary follow-up are crucial for improving disease control and quality of life.

Keywords: Genodermatosis, Mucocutaneous examination, Seborrhoeic.

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Poster Abstract No.: 07

The Yellow Tint in a Neonate-Unravelling Rare Cause of Persistent Jaundice

JAIRUS SAO THONGER[1]

ABSTRACT

Introduction: Persistent unconjugated hyperbilirubinemia in neonates is commonly associated with breast milk jaundice, hemolytic disorders, congenital hypothyroidism, and, rarely, inherited disorders of bilirubin metabolism such as Gilbert syndrome and Crigler–Najjar syndrome. Early diagnosis is essential to prevent complications, including kernicterus, and to improve long-term outcomes.

Materials and Methods: A 45-day-old term male infant, born of a consanguineous marriage by normal vaginal delivery, presented with persistent jaundice. The infant was exclusively breastfed and had no pallor, petechiae, purpura, or hepatosplenomegaly. On day 20 of life, total serum bilirubin was 21.2 mg/dL with indirect bilirubin of 20.7 mg/dL. Direct Coombs test, thyroid function tests, and abdominal ultrasonography were normal. As routine investigations failed to identify the cause, *UGT1A1* genetic testing was performed. The infant received triple-surface phototherapy, oral phenobarbitone (5 mg/kg/day), and continued breastfeeding.

Results: Genetic analysis identified a pathogenic *UGT1A1* mutation, confirming Crigler–Najjar syndrome Type II. Following treatment, serum bilirubin levels gradually declined, and the infant showed clinical improvement. At follow-up, the child remained asymptomatic, developmentally appropriate, and free from neurological complications. Genetic counselling was provided to the family.

Conclusion: Crigler–Najjar syndrome Type II should be considered in the differential diagnosis of persistent neonatal unconjugated hyperbilirubinemia when routine evaluation is inconclusive. Early *UGT1A1* genetic testing provides a definitive, non-invasive diagnosis, enabling timely initiation of phenobarbitone therapy, prevention of bilirubin-related neurological injury, and appropriate family counselling.

Keywords: Crigler-Najjar syndrome. Gilbert syndrome, Hyperbilirubinaemia.

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Poster Abstract No.: 08

NABL QC: An Explainable AI Framework for Digital Pathology Quality Control

RASI KILARI[1], SHILPA GUPTA[2], RAMYA M[3], VINODHINI ASOKAN[4], ANIL REDDY[5], VIJAYASHREE RAGHAVAN[6]

ABSTRACT

Introduction: Quality Control (QC) in digital pathology is essential for ensuring diagnostic accuracy and meeting laboratory accreditation requirements. Existing digital pathology QC tools are often designed for proprietary whole-slide image formats and provide limited transparency regarding decision-making. This creates challenges for laboratories seeking explainable, auditable, and NABL-compliant quality assurance workflows.

Materials and Methods: An automated QC pipeline was developed to evaluate Haematoxylin and Eosin (H&E) stained pathology images in JPEG, PNG, and TIFF formats. The framework assesses multiple quality parameters, including staining quality, sharpness, brightness, contrast, artifact detection, and tissue coverage.

Results: Validation was performed on 50 H&E-stained slides. The system achieved staining assessment accuracy of 94%, sharpness detection accuracy of 92%, artifact sensitivity of 96%, and tissue coverage agreement of 88%. Heatmap-based visualisation enabled localisation of staining defects, blur, contrast abnormalities, artifacts, and tissue coverage issues.

Conclusion: The proposed NABL QC framework provides a comprehensive, explainable, and accreditation-ready solution for digital pathology quality control.

Keywords: Haematoxylin and eosin, Heatmap-based visualisation, Quality control.

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Poster Abstract No.: 09

A Curious Case of Chronic Koro

SALIL RAM[1]

ABSTRACT

Introduction: Koro is a rare culture-bound syndrome characterised by sudden and intense anxiety that the penis is retracting into the body and may eventually lead to death. The condition is most prevalent in South and East Asia. In India, a mass epidemic of Koro was reported in 2010 involving West Bengal, Maharashtra, Tripura, and a few cases from Kerala. Reports from Tamil Nadu are extremely uncommon. This case highlights the importance of recognising Koro syndrome in patients presenting with persistent genital complaints despite the absence of organic pathology.

Materials and Methods: A young unmarried male was referred from the Urology Department with complaints of penile pain and reduced urine output for one year. Extensive urological evaluation was unremarkable, and repeated reassurance failed to alleviate his symptoms. Psychiatric evaluation revealed a five-year history of persistent fear that his penis was gradually retracting into his body following masturbation, causing pain and eventually leading to death. Dhat syndrome was ruled out, and the patient reported no prior knowledge or exposure to similar symptoms. He underwent multiple sessions of psychoeducation, supportive psychotherapy, and treatment with antidepressants.

Results: The patient showed minimal improvement with reassurance, psychotherapy, and antidepressant therapy. Subsequently, low-dose olanzapine (2.5 mg/day) was initiated, resulting in significant improvement in anxiety, distress, and preoccupation regarding penile retraction. He has remained clinically stable on maintenance therapy for the past four years without recurrence of severe symptoms.

Conclusion: This case emphasises the importance of considering Koro syndrome in the differential diagnosis of persistent genital complaints after excluding organic causes. Early psychiatric referral, appropriate diagnosis, and a combination of psychotherapy and pharmacological treatment can lead to sustained clinical improvement. Increased awareness among clinicians may facilitate timely recognition and prevent unnecessary investigations and patient distress.

Keywords: Anxiety, Culture-bound, Epidemic.

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Poster Abstract No.: 10

When the Algorithm Confirms the Delusion: A Case Report of AI-induced Persecutory Paranoia and Chatbot Sycophancy Managed with Adapted CBTp

VIGNESH B[1]

ABSTRACT

Introduction: The widespread availability of generative artificial intelligence (AI) and synthetic media has transformed the presentation of technology-related delusions. Vulnerable individuals may incorporate deepfakes and generative AI into persecutory belief systems, leading to impaired reality testing. This case highlights a novel AI-mediated persecutory delusion reinforced by interactions with a large language model (LLM) chatbot.

Materials and Methods: A 26-year-old female UI/UX designer presented with a three-week history of severe insomnia, social withdrawal, and hypervigilance following exposure to a hyper-realistic deepfake after a corporate data breach. She believed an autonomous AI had created a "digital twin" of her on the dark web to monitor and destroy her reputation. To investigate, she spent nearly eight hours daily interacting with an LLM chatbot, whose conversational responses reinforced her persecutory beliefs. Mental status examination revealed Grade I insight and marked device avoidance. She was treated with oral olanzapine (up to 10 mg nightly), a supervised device-free digital detox, and a structured 12-session Cognitive Behavioral Therapy for Psychosis (CBTp) program incorporating AI psychoeducation, cognitive restructuring, and graded digital re-exposure.

Results: The patient demonstrated progressive improvement in sleep, anxiety, and psychotic symptoms. Insight improved from Grade I to Grade IV over six weeks. She regained confidence in using digital devices, successfully resumed occupational functioning, and remained clinically stable following treatment.

Conclusion: This case illustrates an emerging psychiatric challenge where real-world AI technologies become incorporated into persecutory delusions. Conversational sycophancy in LLMs may inadvertently reinforce pathological beliefs in vulnerable individuals. Comprehensive digital history-taking, AI literacy, and integration of psychoeducation with standard psychiatric treatment may be essential for managing technology-mediated psychosis in the era of generative AI.

Keywords: Artificial intelligence, Digital hygiene, Synthetic media.

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Poster Abstract No.: 11

The Incidental Timebomb: Managing Asymptomatic Extreme Hypertension Secondary to Bilateral Cystic Renal Disease

SIVARAM KRISHNAN[1]

ABSTRACT

Introduction: Severe asymptomatic hypertension is a clinical challenge because of the risk of silent target-organ damage and the possibility of underlying secondary causes. Renal parenchymal disorders are important but frequently overlooked causes of resistant or markedly elevated blood pressure. This case highlights the importance of a systematic evaluation for secondary hypertension in patients presenting with severe hypertension in the absence of symptoms.

Materials and Methods: An adult patient presented with markedly elevated blood pressure detected during routine evaluation without symptoms suggestive of hypertensive emergency. A comprehensive clinical assessment, laboratory investigations, and imaging studies were performed to identify secondary causes of hypertension. Contrast-enhanced computed tomography of the kidneys, ureters, and bladder (CT-KUB) was undertaken to evaluate renal pathology.

Results: CT-KUB demonstrated a giant thin-septated right renal cyst measuring 105×93 mm, causing significant compression of the adjacent renal parenchyma, along with an interpolar renal calculus. The cyst was considered the most likely etiology of secondary hypertension due to renal ischemia with subsequent activation of the renin–angiotensin–aldosterone system (RAAS). No other significant secondary causes of hypertension were identified. The imaging findings established the diagnosis of a giant renal cyst causing renovascular-like hypertension, thereby guiding appropriate management.

Conclusion: Giant renal cysts, although uncommon, should be considered in the differential diagnosis of severe asymptomatic or resistant hypertension. Compression of the renal parenchyma may lead to RAAS activation, resulting in secondary hypertension that can mimic essential or renovascular hypertension. Early recognition through appropriate imaging facilitates timely intervention, prevents long-term target-organ damage, and improves blood pressure control.

Keywords: Renal parenchymal disorders, Renin-angiotensin-aldosterone system, Secondary hypertension.

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Poster Abstract No.: 12

Seasonal Variation in Eosinophil Reference Intervals: A Big Data Analysis of 40,108 Samples from a South Indian Tertiary Care Centre

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ABSTRACT

Introduction: Eosinophil counts are influenced by environmental allergens, parasitic infections, climatic conditions, and analytical methodology. Conventional eosinophil reference intervals are largely derived from Western populations and do not account for seasonal variation or differences between analyser platforms.

Materials and Methods: A retrospective laboratory data analysis was conducted at a tertiary care centre in Chennai, India, using complete blood count records collected between March 2022 and February 2026. A healthy adult subset comprising 40,108 samples from a 6-part haematology analyser and additional samples from a 5-part analyser was analysed.

Results: Significant seasonal variation in eosinophil counts was observed ($p<0.001$). Summer demonstrated the highest median eosinophil count ($0.270\times10^3/\mu L$), upper reference limit ($1.820\times10^3/\mu L$), and eosinophilia prevalence (34.4%), compared with winter (30.2%).

Conclusion: Eosinophil reference intervals in tropical populations exhibit significant seasonal variability and substantial analyser-dependent differences.

Keywords: Eosinophilia prevalence, Haematology analyser, Median eosinophil count.

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Poster Abstract No.: 13

Beyond the Antenatal Register: Unmasking Anaemia across the OBG Catchment Area using Laboratory Big Data

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ABSTRACT

Introduction: Anaemia remains a major public health challenge among women of reproductive age and is associated with adverse maternal and foetal outcomes, including preterm birth, low birth weight, postpartum haemorrhage, and increased maternal morbidity. Population-based surveys often underestimate the true clinical burden of anaemia in women attending Obstetrics and Gynaecology (OBG) services.

Materials and Methods: A retrospective analysis was conducted using 1,656 OBG laboratory records from January to June 2026. Data were obtained from a 6-part haematology analyser and included Obstetric (OBS) and Gynaecology (GYN) patients. Anaemia was defined according to World Health Organisation criteria, and cases were categorised by morphology and severity.

Results: Among 631 unique OBG patients, the overall prevalence of anaemia was 69.1%, substantially higher than both the general female population reference cohort (39.1%) and National Family Health Survey-5 (NFHS-5) estimates (57.0%). Anaemia prevalence was higher in obstetric patients (71.5%) than in gynaecology patients (64.0%).

Conclusion: This laboratory-based big data analysis demonstrates a substantial burden of anaemia among women attending OBG services, exceeding national prevalence estimates. The predominance of normocytic anaemia suggests that causes beyond iron deficiency contribute significantly to disease burden.

Keywords: Maternal morbidity, National Family Health Survey-5, Obstetrics and Gynaecology.

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Poster Abstract No.: 14

Multisystem Inflammatory Syndrome in Children (MIS-C): Clinical Spectrum, Management, and Outcomes in Children Presenting with Hyperinflammation and Shock

JAIRUS SAO THONGER[1]

ABSTRACT

Introduction: Multisystem Inflammatory Syndrome in Children (MIS-C) is a severe post-COVID-19 hyperinflammatory condition characterised by persistent fever, systemic inflammation, and cardiovascular dysfunction. Its clinical presentation is heterogeneous and may mimic infectious, autoimmune, or hematological disorders, making early diagnosis challenging despite established diagnostic criteria. Recognition of its diverse manifestations is essential for timely diagnosis and management.

Aim / Objectives: To describe the clinical spectrum, management, and outcomes of children with MIS-C presenting with hyperinflammation and shock, and to explore the relationship between SARS-CoV-2 serological responses and disease severity.

Materials and Methods: A case-series analysis was conducted involving five children diagnosed with MIS-C. Clinical features, inflammatory status, shock presentation, differential diagnoses, SARS-CoV-2 IgG antibody titres, management strategies, and outcomes were reviewed. Disease severity was assessed in relation to hyperinflammatory markers and clinical presentation.

Results: All five children demonstrated seroconversion to SARS-CoV-2, supporting previous COVID-19 exposure. Clinical manifestations were diverse, ranging from hyperinflammation without shock to severe hyperinflammatory shock. Common features included prolonged fever, mucocutaneous involvement, conjunctivitis, lymphadenopathy, facial puffiness, gastrointestinal symptoms, and circulatory compromise.

Conclusion: MIS-C remains an important diagnosis to consider in children presenting with fever, hyperinflammation, and shock following COVID-19 exposure. Recognition of its broad clinical spectrum and prompt initiation of appropriate therapy are critical to preventing multiorgan dysfunction and improving clinical outcomes.

Keywords: Coronavirus disease, Hyperinflammatory, Seroconversion.

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Poster Abstract No.: 15

Correlation between Glucose Variability and Electrocardiographic Changes in Type 2 Diabetic Patients: An Observational Cross-sectional Study at a Tertiary Care Hospital, Tiruvallur

THIYAGARAJAN BALU[1]

ABSTRACT

Introduction: Type 2 Diabetes Mellitus (T2DM) is associated with an increased risk of cardiovascular complications, including electrical and structural abnormalities of the heart. Both acute glucose fluctuations and sustained hyperglycaemia may contribute to cardiac dysfunction. Identifying ECG abnormalities and their association with glycaemic status and metabolic comorbidities may facilitate early recognition of cardiovascular risk in T2DM patients.

Aim: To assess the frequency and type of Electrocardiogram (ECG) abnormalities in Type 2 Diabetes Mellitus (T2DM) patients stratified by Random Blood Sugar (RBS) levels; to compare the independent contribution of acute glucose variability versus sustained hyperglycaemia {Glycosylated Haemoglobin (HbA1c)} to Electrocardiogram (ECG) changes; and to determine the association of comorbidities—hypertension, dyslipidaemia, and obesity—with ECG abnormalities.

Materials and Methods: Observational cross-sectional study was conducted enrolling 150 consenting T2DM patients from the General Medicine IP, OPD, and MICU at Vels Medical College and Hospital, Tiruvallur, over 8 weeks. Standard 12-lead ECG (MINDRAY BeneHeart R12) was recorded contemporaneously with RBS, Fasting Blood Sugar (FBS), Post-Prandial Blood Sugar (PPBS), HbA1c, electrolytes, lipid profile, renal function, and Thyroid Stimulating Hormone (TSH).

Results: Study ongoing—data collection in progress. Results will be presented at the conference.

Conclusion: This study will characterise the independent role of acute glucose variability versus chronic hyperglycaemia in ECG abnormalities among T2DM patients, providing locally relevant data from Tamil Nadu to guide early cardiac screening strategies in resource-limited settings.

Keywords: Renal function, Sustained hyperglycaemia, Type 2 diabetes mellitus.

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Poster Abstract No.: 16

Papilloedema in Primary Empty Sella Syndrome: A Case Report

SAHISHNA RANGA[1]

ABSTRACT

Introduction: Papilledema is an important clinical sign of raised intracranial pressure (ICP) and requires prompt evaluation to prevent irreversible visual loss. Idiopathic intracranial hypertension (IIH) has been associated with empty sella syndrome and polycystic ovarian morphology (PCOM)/polycystic ovary syndrome (PCOS). Early diagnosis and multidisciplinary management are essential for preserving vision and improving patient outcomes.

Materials and Methods: A 21-year-old unmarried woman presented with a two-week history of mild headache and bilateral blurring of vision, along with transient diplopia for one week. She also had menstrual irregularities and a known history of polycystic ovarian morphology (PCOM)/polycystic ovary syndrome (PCOS). Ophthalmic examination revealed uncorrected visual acuity of 6/9 in both eyes, improving to 6/6 in the left eye with correction. Fundus examination showed bilateral papilledema with hyperemic edematous optic discs, cotton wool spots, and venous dilatation. Magnetic resonance imaging (MRI) of the brain demonstrated an empty pituitary fossa, hyperintense peri-optic cerebrospinal fluid spaces, and posterior globe flattening. Ultrasonography of the abdomen revealed bilateral polycystic ovarian morphology.

Results: The clinical and radiological findings were consistent with raised intracranial pressure associated with empty sella syndrome in a patient with polycystic ovarian morphology. Early recognition of papilledema prompted appropriate multidisciplinary evaluation and management, reducing the risk of permanent visual impairment.

Conclusion: This case highlights the association between papilledema, raised intracranial pressure, empty sella syndrome, and polycystic ovarian morphology in young women. Comprehensive ophthalmic and neuroimaging evaluation is crucial in patients presenting with papilledema and headache. Early diagnosis and coordinated multidisciplinary management are essential to preserve vision and improve overall patient well-being.

Keywords: Idiopathic intracranial hypertension, Intracranial pressure, Poly metabolic ovarian syndrome.

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Poster Abstract No.: 17

Isolated Cutaneous Leukocytoclastic Vasculitis: A Case Report

BEERE HINDU KUMAR[1]

ABSTRACT

Introduction: Leukocytoclastic vasculitis (LCV) is a small-vessel vasculitis characterised by neutrophilic infiltration and destruction of dermal vessel walls. It classically presents with palpable, non-blanching purpura over dependent areas. Isolated cutaneous LCV requires careful evaluation to exclude systemic vasculitis, connective tissue disorders, infections, and other underlying causes.

Aim / Objectives:

- To describe the clinical presentation of isolated cutaneous leukocytoclastic vasculitis.
- To confirm the diagnosis histopathologically using punch skin biopsy.
- To perform systematic immunological and biochemical evaluation to exclude systemic vasculitis and connective tissue disease.
- To document the treatment response and clinical outcome.

Materials and Methods: This descriptive case report involved a single patient managed at the Department of General Medicine, Vels Medical College and Hospital, Tiruvallur. A detailed history and clinical examination were performed, followed by appropriate laboratory investigations and histopathological evaluation.

Results: A 50-year-old female presented with bilateral lower limb swelling and redness of one-day duration, associated with intermittent fever for one week. Examination revealed multiple, confluent, firm, non-blanching purpuric lesions over the lower two-thirds of both legs, predominantly involving the anterior aspects. No identifiable precipitating trigger was noted.

Conclusion: Isolated cutaneous leukocytoclastic vasculitis is a diagnosis of exclusion requiring systematic clinical, biochemical, immunological, and histopathological evaluation. Skin biopsy plays a crucial role in confirming the diagnosis and should be considered in patients presenting with persistent or unexplained non-blanching purpuric lesions.

Keywords: Neutrophilic infiltration, Small vessel, Vasculitis.

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