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19th Annual Scientific Meeting, College of Pathologists, Academy of Medicine of Malaysia: Pathology and Laboratory Medicine: Current, Advancement and Emerging Trends, co-organised by Department of Pathology, Hospital Melaka, Department of Clinical Diagnostic Laboratories, Hospital Universiti Teknologi MARA (HUiTM) and the College of Pathologists, Academy of Medicine of Malaysia and held virtually on 22nd-24th June 2022. Abstracts of K. Prathap memorial lecture, plenary, symposium and paper (oral and poster) presented are as follows:

K. Prathap Memorial Lecture: Viral infections of pregnancy, beyond diagnosis to treatments

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Advances in understanding viral infections such as congenital CMV continue to be introduced into clinical practice. There remain areas where additional data are needed to guide use of diagnostics, antivirals and vaccines. Areas of particular interest include i) the pathogenesis of congenital infection, particularly mechanisms of mother to child transmission (MTCT), placental cell infection, and viral genomic variability, ii) models of infection including multicellular human organ/organoid and animal models, iii) issues of transmission including screening of pregnant women routinely, biomarkers of transmission, timing of subsequent pregnancy post-primary infection, iv) clinical presentation and definitions, v) complications of infection, particularly the role in chronic disease, long term effects of infection on asymptomatic infants, long term effects of neonatal antiviral therapy, vii prevention strategies including education, primary prevention and universal newborn screening, and viii) vaccine delivery, models and new vaccines. My focus will be on diagnosis of infection, particularly in relation to congenital Cytomegalovirus (CMV). I will reflect upon how our studies of pathogenesis, prevention, and complications influences how we approach the diagnosis of congenital infection, particularly congenital CMV. Pathogenesis studies have advanced our understanding of the progress of infection during MTCT, with evidence of CMV dysregulation of cellular proteins showing specific pathways are altered. Diagnosis and complications of congenital CMV complications with new assays to identify symptomatic (mortality in 1-2%), and longer term adverse neurodevelopmental outcomes in otherwise asymptomatic infants. Prevention of CMV and CMV vaccines are occurring in many countries. This herald a new era in reducing the burden of congenital CMV in all countries.

Plenary 1: Digital Pathology and Artificial Intelligence: Embracing the Future of Modern Technology (Plenary)

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In-silico reporting holds significant advantages in relation to traditional, microscope-based reporting, including improvements in diagnostic accuracy, long-term cost-effectiveness, laboratory quality and accreditation, and other measures of diagnostic quality such as turn-around time. In addition, the opportunity of remote reporting has become increasingly relevant after situations such as the COVID-19 crisis. Indeed, digital pathology is able to facilitate remotely the full extent of the pathological routine: access to slides, laboratory requests and clinical information; intradepartmental consultations, sign-outs and resident teaching; attendance to multidisciplinary team meetings; remote interdepartmental expert consults and remote, extramural teaching. However, the main advantage of diagnostic digitisation in routine pathology is only beginning to be a practical realisation, holding significant promise to represent a true disruptive diagnostic approach: the application of digital pathology and artificial intelligence tools in diagnostics, either as clinical decision support tools or as automated diagnostic decision algorithms. These tools are beginning to emerge at many levels, applied to H&Es, immunohistochemistry or new, complex hybridisation approaches such as multiplex immunofluorescence. This plenary lecture will review this evidence in some detail, placing these developments in the overall evolution of microscopic pathology since its establishment as a clinical discipline.

CP13 Evaluation of frozen aliquots of Bio-Rad Lyphochek Diabetes Controls stability using Bio-Rad D-10 HbA1c analyser

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Introduction: Bio-Rad Lyphochek Diabetes Quality Control (QC) material is a human whole blood based, with a 3-year shelf life and 7-day reconstituted stability at 2-8°C. Thus, our aim is to evaluate the stability of open-vial (stored at 2 to 8°C) and frozen aliquots (stored at -20°C) if used beyond the recommended stability period. *Materials & Methods:* A total of 14 vials of each level were prepared and each vial of QC was reconstituted as per manufacturer recommendation. Triplicates of each QC level were run daily to determine repeatability, imprecision and bias (against respective peer group). Data was compared against appropriate quality specification for HbA1c; allowable imprecision of 2.5% (IFCC) and allowable bias minimum of 2.1% (EFLM, 2020). *Results:* Open vial QC (stored at 2 to 8°C) is still stable for up to 34 days (n=24). As for frozen aliquots, it demonstrates consistent stability throughout the study period of 93 days (n=63) for both QC levels. When compared to its peer group, frozen aliquot CV% was better suggesting that performance was acceptable. In terms of bias, frozen aliquot and extended days usage had higher bias of 2.1% and 1.73% respectively compared to manufacturer recommendation. *Discussion:* Open vial Bio-Rad Lyphochek Diabetes QC material is stable for up to 2 weeks if stored at 2 to 8°C while for frozen aliquoted kept at -20°C can be used up to 14 weeks. Users need to be cautious whenever there is a shift in QC trend once it exceeds the manufacturer recommended period.

CP14 Early neonatal death with Citrullinaemia type 1

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Introduction: Hyperammonaemia in neonates can lead to grave consequences if not treated early. *Case report:* An 8-day old baby boy, delivered uneventfully at 35 weeks+5 days, presented with lethargy and bradycardia. He was initially admitted on day 5 of life for phototherapy and then discharged the next day, to be followed up at a local clinic for jaundice monitoring. During the first follow-up, he was active and tolerated feeding well. However, he deteriorated the next day. He was immediately taken to the hospital, intubated, and treated for presumed meningitis. Initial investigations revealed mixed respiratory acidosis, high lactate (6 mmol/L), hyperammonaemia (1364 µmol/L) with normal liver function tests. He was hypotensive with neurological examination showing hypotonia and hyporeflexia. His ammonia level decreased to 524 µmol/L following administration of sodium benzoate, sodium phenylacetate and arginine. Plasma amino acid analysis revealed marked elevation of citrulline whilst urine organic acid analysis showed increased excretion of orotic acid. Dried blood spots also showed significant elevation of citrulline with normal arginine level. A diagnosis of Citrullinaemia type 1 was made. Unfortunately, he succumbed to death on day 10 of life. *Discussion:* Citrullinaemia type 1 is a rare autosomal recessive inherited metabolic disorder that occurs due to deficiency of arginosuccinate synthetase in the urea cycle. Although this patient was managed aggressively, he may have developed hyperammonemia coma due to the delayed presentation. For patients with inherited metabolic disease, early diagnosis, and management of their diseases are crucial to prevent irreversible organ damage and death.

CP15 Broad bands on serum protein electrophoresis: a diagnostic challenge

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Introduction: Serum protein electrophoresis (SPE) is one of laboratory investigations performed as part of multiple myeloma workup. Distinct band suggestive of presence of paraproteinaemia on SPE is usually proceeded with immunofixation to identify the clonality. However, the appearance of paraprotein bands on SPE may not be as straightforward to interpret. *Case report*: We described two different patients who had SPE performed as part of multiple myeloma investigation. Presence of broad bands were seen on respective SPE. Subsequent immunofixation electrophoresis (IFE) revealed presence of polyclonal differentiation of IgG, Kappa and Lambda light chains, and faint free lambda light chain in the gamma region for patient A. Whereas, IFE for patient B revealed presence of IgA Kappa paraprotein band in the background of polyclonal increase of gamma globulins migrating towards beta region ("band-in-band" appearance). Other laboratory findings including bone marrow examinations confirmed the polyclonality and monoclonality of these two cases, respectively. *Discussion*: It is crucial to differentiate monoclonal from polyclonal gammopathies. Monoclonal gammopathies are often associated with malignant or potentially malignant disease. This is usually demonstrated by a sharp peak and distinct band in the gamma region. In contrast, polyclonal gammopathies are often caused by inflammatory or infective causes, giving a broad band appearance in the gamma region. IFE is required to differentiate monoclonality from polyclonality of these gamma globulins. We highlighted the challenges in interpreting broad bands especially in identifying and quantifying the paraproteins.