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Abstract no. 1

Establishing indirect reference intervals for creatinine and urea in geriatric patients using data stored in the Laboratory Information System

Umi Khalsom Abd Aziz[1], Izzatul 'Aliaa Baharuddin[1], Dian Nasriana Nasuruddin[1], Hazlina Mahadzir[2], Noraidatulakma Abdullah @ Muda[3], Siti Sarah Mustapa[4], Munirah Md Mansor[1]

[1]Department of Pathology, Pusat Perubatan Universiti Kebangsaan Malaysia (PPUKM), Hospital Canselor Tuanku Mizan (HCTM); [2]Department of Medicine, Pusat Perubatan Universiti Kebangsaan Malaysia (PPUKM), Hospital Canselor Tuanku Mizan (HCTM); [3]UKM Medical Molecular Biology Institute (UMBI), The National University of Malaysia (UKM), Cheras, Kuala Lumpur, Malaysia; [4]Department of Pathology, Hospital Ampang.

Introduction: Many reference intervals are determined by recruiting young and middle-aged healthy individuals. This presents significant challenges in obtaining geriatric reference intervals for selecting healthy individuals, as the majority of seniors do not meet the 2018 C28-A3 Clinical and Laboratory Standards Institute guideline criteria (CLSI). The committee of Reference Intervals and Decision Limits (C-RIDL) of the International Federation of Clinical Chemistry (IFCC) encourages the use of an indirect method as an alternative. In this study, we established reference intervals for serum creatinine and urea in geriatric patients older than 60 years, using the indirect method. Materials and Method: Data was obtained from the Laboratory Information System (LIS) at Hospital Canselor Tuanku Muhriz from 1st January to 31st December 2020. Samples of serum creatinine and urea were examined using the kinetic alkaline picrate (kinetic Jaffe) method and urease enzymatic method, respectively. Our method for measuring serum creatinine is traceable to the standard method of isotope-dilution mass spectrometry (IDMS) as recommended by the National Kidney Disease Education Programme (NKDEP) Laboratory Working Group. After removing duplicate results, exclusion criteria, and outliers, a total of 14,967 and 13,542 serum creatinine and urea data points were analysed, respectively. Results: The reference intervals for serum creatinine and urea in geriatric patients are 52.9 – 107.1 μmol/L and 2.3 – 7.4 mmol/L, respectively. Female reference intervals for serum creatinine and urea are 51.4 – 89.5 mol/L and 2.2 – 7.3 mmol/L, respectively, which are lower than male reference intervals, which are 59.0 – 108.9 mol/L and 2.5 – 7.4 mmol/L. We also observed significant racial differences in the reference intervals. Conclusions: The established reference intervals for serum creatinine and urea vary according to age, gender and race. To prevent misdiagnosis, it is imperative to compare the patient's result to the appropriate reference intervals, ideally based on gender, age, and race.

Abstract no 2

Hepatitis C virus (HCV) genotype: Distribution and its relevance to patient management

Safiah Abdullah[1], Rosnaida Ghadzali[1], Nurul Asshikin Ruslan[1] & Rozainanee Mohd Zain[1]

Virology Unit, Infectious Disease Research Centre, Institute for Medical Research Block C, No.1, Jalan Setia Murni U13/52 Seksyen U13 Setia Alam 40170 Shah Alam, Selangor.

Introduction: With an advanced in the treatment of hepatitis C infection, hepatitis C virus (HCV) genotype testing is projected to becoming less popular test among the gastroenterologist. Since June 2021, the Drug Control Authority (DCA) Malaysia has granted conditional registration for Ravida® Tablet 200 milligram (Ravidasvir Hydrochloride 200mg), a pangenotypic drug for an effective HCV treatment. Traditionally, HCV Genotypes was required on every patient to assist in choosing the right HCV treatment regime. This study aimed to evaluate the distribution of HCV genotypes in Malaysia and discuss on its relevance clinically. Methodology: A total of 1388 samples were received for HCV genotype test at IMR from 2018 till 2022. The samples were subjected to cobas® HCV GT test, according to manufacturer's instructions. It is a highly sensitive, real-time PCR based test for the qualitative identification of HCV genotypes 1 to 6 and genotype 1 subtypes A and B for individuals with chronic HCV infection. Results: The analysis showed that HCV genotype 3 (67.5%) is identified as the main HCV genotype in the study population. While the second common genotype is HCV genotype 1 (31.6%). 7.6 % of samples were concluded as unable to determine genotype. Small percentage of samples produced invalid results. Discussion/ Conclusion: Genotype 1a and 3a were reported in 2020 to be the predominant genotypes in Malaysia, however, the sample size for the study was too low. Meanwhile in 2015, HCV genotype 3 was reported to be the predominant genotype with overall frequency of 61.9% and followed by genotypes 1 (35.9%), which is similar to our current findings. Currently, some guidelines still require determination of HCV genotype for cirrhotic patients' management, which means the test is still clinically relevant. In conclusion, HCV genotype assay remains to support the patient care for HCV.

Abstract no 3

Extramedullary hematopoiesis in the adrenal gland

Nor Akmar Sulaiman[1,2], Dr Nor Aizan Ab.llah @ Ariffin[1], Prof Madya Dr Maizaton Atmadini Abdullah[2], Dr Fauzah Abdul Ghani[2]
[1]Pathology Department, Selayang Hospital; [2]Pathology Department, Hospital University Putra Malaysia

Introduction: Extramedullary haemopoiesis is a compensatory mechanism for deficient formation or function of red blood cells. It typically occurs in the reticulo-endothelial system, which includes the liver, spleen, and lymph nodes, in conjunction with haematological diseases such thalassaemia major or hereditary spherocytosis or chronic haemolytic anaemia or myelofibrosis. Rarely, extramedullary haematopoiesis is discovered in the adrenal and kidneys. Case report: We report case of a 49-year-old female with underlying Alpha Thalassaemia intermedia, not on regular transfusion and had defaulted follow up. She had fatty liver with splenomegaly. She presented with haematuria and abdominal pain. CT scan revealed left adrenal mass measuring 4.5cm x 4.5cm. Thus, she underwent laparoscopic adrenalectomy. Grossly the adrenal mass is lobulated congested mass with attached fatty tissue weighing 20.4grams, measuring 70X40X30mm. The capsule shows focal disruptions and section shows-well-circumscribed brownish mass with focal congested and haemorrhagic cut surface. No obvious adrenal tissue seen grossly. Histology examination revealed the mass composed of mature haematopoietic elements, with a predominance of erythroid series. A few megakaryocytes and scanty adrenal tissue were noted. The histology findings suggestive of extramedullary haematopoesis of adrenal gland. Discussion: EMH in the adrenal gland is rare, with only a few case reports published in the literature. It is most commonly seen in patients with thalassaemia, myelofibrosis, and other chronic haematological disorders, Although the adrenal gland has a limited capacity for haematopoiesis, it can develop EMH in response to chronic anaemia or haematological disorders. EMH in the adrenal gland is usually asymptomatic and discovered incidentally on imaging studies which can mimic adrenal adenomas or metastatic tumours. Therefore, it may require biopsy to confirm the diagnosis to prevent unnecessary adrenalectomy. Treatment for EMH in the adrenal gland is typically not necessary, as it is usually asymptomatic and does not cause any functional impairment of the gland. Therefore, adrenal extramedullary haematopoiesis should include in the differentials of adrenal masses, particularly in those with haemoglobinopathies or marrow disorders.

Abstract no 4

Primitive neuroectodermal tumour (PNET) / Extraosseous Ewing's sarcoma of pancreas

Nor Akmar Sulaiman, Maalini Krishnasamy, Noor Afidah Mohamed Shabery
Pathology Department, Selayang Hospital

Introduction: Ewing sarcoma is a rare type of cancer that typically arises in the bones or soft tissues of children and young adults. However, Ewing sarcoma can also arise in other parts of the body, including the pancreas. However, primitive neuroectodermal tumour (PNET) of the pancreas is a rare tumour that often affects children or young adults. Extraosseous Ewing's sarcoma is peripheral primitive neuroectodermal tumour and known as the Ewing's family of tumours (EFT). The pathogenesis are produced by reciprocal translocation involving the FLI1 gene and EWSR1 gene at 22q12, or t(11;22)(q24;q12). The fusion gene EWS-FLI1 promotes the growth of malignant tumours by disrupting transcription and apoptosis. The MIC2 gene encodes the cell surface glycoprotein CD99, which is strongly expressed by the majority of EFT. Case report: We describe a case of a 33-year-old male, no medical illness, history of 1 week of worsening epigastric pain and vomiting. CT scan abdomen reveals obstructive duodenal mass complicated with perforation. Biopsy of duodenal mass shows small round blue cells and immunohistochemical study favoring Ewing/PNET. Patient underwent pancreatoduodenectomy procedure (Whipple resection). Histological findings of Whipple resection's specimen consistent with Extraosseous Ewing's sarcoma/PNET of pancreas metastasis to the duodenum with involved margin. The malignant cell is positive towards CD99, FLI-1 and NK2.2. Discussion: Ewing sarcoma of the pancreas is a rare and aggressive malignancy that typically presents with nonspecific symptoms and is diagnosed through imaging studies and biopsy. Prognosis for pancreatic Ewing sarcoma is generally poor, with a reported 5-year survival rate of less than 20%. However, the prognosis may be improved with aggressive multimodality therapy, including surgery, chemotherapy, and radiation therapy. Conclusion: Even though PNET in the pancreas is a very uncommon condition, it should be considered when making a differential diagnosis of pancreatic masses, especially in young individuals.

Abstract no 5

Presence of CD34+ in acute megakaryoblastic leukaemia (Myelodysplastic Syndrome transformation)

Nur Fatin Izati Ahmad Mustaffa, Sanada Abu Bakar, Nor Nazuha Mohamad@Manas, Faridah Hanim Zan, Abdul Kadir Mat, Nurul Atiqah Abdul Ghani
Hematology Unit, Department of Pathology, Hospital Taiping, Perak, Malaysia

Introduction: Acute megakaryoblastic leukaemia (AMKL) is a rare subtype of acute myeloid leukaemia (AML) which is defined as 50% or more of total blast cells are of megakaryocyte lineage. AMKL can be classified as primary or secondary to myelodysplastic syndrome (MDS) or myeloproliferative neoplasm (MPN). The tumour cells usually show negativity for myeloperoxidase (MPO) and CD34. Here we share a case of MDS transformed to AMKL with unusual positive CD34. Case report: A 52-years old Chinese man with underlying hypertension, presented with symptomatic anaemia for 3 weeks associated with unprovoked gum bleeding. Clinically, he was pale with no palpable lymphadenopathy or hepatosplenomegaly. Laboratory investigations revealed bicytopenia (haemoglobin (Hb): 6.7g/dL, platelet: 14 x10^9/L and white cell count (WBC): 9.6x10^9/L). Initial bone marrow aspiration and trephine biopsy done in private hospital revealed hypercellular marrow with presence of dysplastic megakaryocytes. He was referred to our hospital and induced with sc azacytidine for seven days and Tab Venclexta 400 mg OD for total 21 days. Repeated PBF (post-chemotherapy) showed leukoerythroblastic picture with occasional blasts. The bone marrow aspiration showed hypercellular marrow with trilineage dysplasia and 21% megakaryoblasts.

Bone marrow trephine biopsy showed marked increase in megakaryocytes and megakaryoblasts with immunoreactive to CD61 and CD34. Cytogenetic analysis of cultured bone marrow revealed a complex cytogenetic involving many numerical and structural abnormalities seen in all 20 cells. The patient was diagnosed with disease progression to AMKL. He passed away at about 5 months of diagnosis. Discussion: Adult AMKL remains extremely poor prognosis with median overall survival of 10 months. We discuss a rare case of MDS transformed to AMKL with unusual positive CD34. He did not respond to the standard treatment due to multiple risk factors such as advanced age, underlying MDS, aggressive disease biology and poor cytogenetic analysis.

Abstract no 6

Feline-transmitted lymphocutaneous sporotrichosis: A case series from a district hospital in Malaysia

Nor Akmal Mokhtar, Aswini A/P Nalla Mutthu Krishna Gandi, Nurul Haifa Mohamed Hafiz, Aziyani Hamzah, Emmi Eliana Esan, Ainon Mardhiah Mohd Daud
Hospital Teluk Intan, Perak, Malaysia

Introduction: Sporotrichosis is a subcutaneous mycosis infection caused by *Sporothrix schenckii*, a thermally dimorphic aerobic fungus. Sporotrichosis typically manifests as a subacute to chronic lymphocutaneous, fixed cutaneous, or cutaneous-disseminated infection. Despite being one of the most common mycosis implantations in the world, including Malaysia, it has been recognised as a neglected endemic mycosis. Case study: Case 1: A 69-year-old woman with type 2 diabetes presented with an erythematous, painless nodule on her left forearm. The patient described a two-month-old cat bite that resulted in a left thumb wound which progressively worsened, necessitating incision and drainage and eventually forming the lymphocutaneous tract of the left forearm. Case 2: A 33-year-old female presented with multiple painful swellings over her right upper limb that had worsened and spread to her right forearm and elbow over the previous two months. Further exploration revealed the history of cat scratching three years ago. Both patients were seen in the dermatology clinic on the same day. Fungal tissue culture and microscopy examination for both patients resembled *Sporothrix schenckii*. The diagnosis was supported by the presence of scanty yeast forms in PAS and GMS stains, as well as histopathological evidence of acute and chronic inflammatory infiltrates. Patients responded favourably to oral itraconazole. Discussion: Traditionally, sporotrichosis was referred to as 'Rose Gardener's disease'. Recently, however, feline sporotrichosis has been increasingly reported in Malaysia. A retrospective study in Kuala Lumpur reported 13/19 cases of sporotrichosis that were associated with preceding trauma, half of which were directly related to cat scratches or bites. Lymphocutaneous sporotrichosis has been identified as the most common clinical presentation of feline-related transmission as presented in both cases. This emphasises the fact that feline transmission of sporotrichosis can potentially cause a public threat therefore worth public health awareness.

Abstract no 7

Reference intervals for lysosomal enzymes activities in plasma and leucocytes sample – A Malaysian experience

Affandi Omar[1], Salina Abdul Rahman[1], Fatimah Diana Amin Nordin[1], Balqis Kamarudin[1], Nur Jannaim Muhamad[1], Noor Mohd Firdaus Othman[2], Nurul Izzati Hamzan[2], Nur Ainaa Afhandi[2], Julaina Abdul Jalil[1]
[1]Inborn Errors of Metabolism & Genetic Unit, Nutrition, Metabolism & Cardiovascular Research Centre (NMCRC), Institute for Medical Research, National Institutes of Health, Ministry of Health Malaysia, Jalan Setia Murni U13/52, 40170 Shah Alam, Selangor, MALAYSIA; [2]Biochemical Genetics Unit, Specialised Diagnostic Centre, Institute for Medical Research, National Institutes of Health, Ministry of Health Malaysia, 50588 Kuala Lumpur, MALAYSIA.

Introduction: Lysosomal storage diseases (LSDs) are inherited diseases that occur due to deficiencies of lysosomal enzymes (LEs), and timely diagnosis is crucial to enable appropriate medical intervention. The present study utilises plasma and leucocyte samples obtained from the Malaysian population to establish reference intervals for the activity of LE, which deficiencies underlies various disorders, including Mucopolysaccharidosis Type I, II, IIIA, IIIB, IIIC, IV, V, and V; Sandhoff; Aspartylglucosaminuria; β-mannosidosis, Fabry; Metachromatic Leukodystrophy; G_{M1} gangliosidosis; α-mannosidosis, α-fucosidosis, Neuronal Ceroid Lipofuscinosis; and Gaucher disease. *Methodology:* Plasma (n=580) and leucocytes (n=290) were collected from a cohort of healthy individuals. Biological samples were processed specific to each LE, fluorescently tagged and levels of LE were detected using spectrofluorometer detection. Total amount of specific LEs were determined based on a standard curve for each fluorescently tagged LE. The reference intervals were determined between 5th to 95th percentile using IBM SPSS software. *Results:* The reference intervals (expressed in nmol/ml/hour) for plasma LE are: β-hexosaminidase A+B (270–1529), aspartyl glucosaminidase (13–43), β-mannosidase (208–514), α-galactosidase (2–10), iduronate-2-sulphatase (16–50), chitotriosidase (<30), and α-N-acetylglucosaminidase. (16-70). Reference intervals for the measurement of LE in leucocyte samples (expressed in nmol/hour/mg protein) are as follows: arylsulphatase A (58-204), β-galactosidase (28-93), α-mannosidase (63-732), α-fucosidase (43-248), palmitoyl-protein thioesterase (17-123), β-glucosidase (3-12), α-iduronidase (16-52), sulphamidase (1.3-23.2), acetyl-CoA:glucosaminide N-acyltransferase (6-33), Galactose-6-sulphatase (0.4-1.7), arylsulphatase B (9-118), and β-glucuronidase (109-228). *Conclusion:* The present study successfully established reference intervals of 20 LE for the Malaysian population. Nonetheless, the findings demonstrate discrepancies between other laboratories highlighting the importance of establishing separate reference intervals for each center.

Abstract no 8

Decoding the immune response biomarkers in dengue infection via transcriptomic approach

Jeyanthi Suppiah[1], Safiah Sabrina Hassan[1], Nur Iman Fasohah Nadzar[1], Nor Abidah Mohd Narawi[2], Saiful Safuan Md Sani[2], Rozainanee Mohd Zain[1] & Ravindran Thayan[1]

[1]Virology Unit, Infectious Disease Research Centre, Institute for Medical Research, National Institutes of Health, Setia Alam, 40170 Selangor Darul Ehsan, Malaysia; [2]General Medicine Department, Hospital Kuala Lumpur, 50586 Jalan Pahang, Kuala Lumpur

Introduction: Dengue virus hijacks host cell mechanisms and immune responses in order to replicate efficiently. This interplay between host and virus has an impact on the host gene expression that remains largely uncharacterised. The present study profiled the host transcriptome as a proxy strategy for highly specific immune biomarkers for prediction of dengue. Methodology: High-throughput-RNA-sequencing was utilised to generate host transcriptome profile in 16 dengue patients and 10 healthy controls. Differentially expressed genes (DEGs) were identified between severe dengue and non-severe dengue (with/without warning signs) against healthy samples. Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) analyses were performed to elucidate the functions of upregulated (URG) and downregulated genes (DRG). Result: Overall, 2948 URG and 1802 DRG were identified in the dengue group in comparison to the healthy controls. Three major KEGG pathways involved are cellular processes (23.4%), metabolism (10.5%), signal transduction (10.3%) and a minority of others. Top 15-gene set related to host immune response and predictive of dengue infection were discovered. Syndecan-1 (SDC1) tops the URG list (log2=6.7) followed by chemokines (CXCL10, CCL8, CCL2, CXCL11, CCL7, CCL1, CCL25, CCL13), LOC102723407, LOC102724971, CASP3, TNFSF10 and interleukins (IL10&IL12A). Meanwhile, SH2DIB related to natural killer cell-mediated cytotoxicity was the most downregulated gene (log2=-1.8) followed by CXCR5, IL5RA, HLA-DOA, IL9R, HLA-DOB, ZMYND15, NCR3, CD244, NCR1, HLA-DQB1, HLA-DQA1, CXCL16, HLA-DPB1 and CCL5. The genes predictive of severe dengue are IL1A, IL1B, IL6, CCL20, CXCL2&3. Additionally, CCL7 is a potential biomarker for progression of severe dengue, expressed twice higher (log2=10.5) than non-severe group (log2=4.5). Discussion/ Conclusion: The discovery of the host immune response biomarkers via sequencing is highly affirmative, subjected for validation in bigger cohorts. The aforementioned biomarkers have great potential in point-of-care testing to complement the existing algorithm of dengue detection.

Abstract no 9

Severe primary refractory thrombotic thrombocytopenic purpura, beyond plasma exchange

Nurul Jawahir binti Mohd Zohdi[1], Fatin Akmal Baharom[2], Zuliana Jamli[3], Nur Afika Ashikin binti Rabit[1]

[1]Pathology unit Hospital Jasin, [2]Haematology unit, Pathology Department, [3]Clinical Haematology, Hospital Melaka

Introduction: Thrombotic thrombocytopenic purpura (TTP) is a rare, life threatening disorder with mortality up to 90%. Thrombocytopenia and microangiopathic haemolytic anaemia (MAHA) define the hallmark of TTP. The advent of plasma exchange (PEX) has changed the prognosis of TTP. It is crucial to identify failure of response to PEX as several studies have established the efficacy of rituximab as an adjunct therapy whether as upfront or in refractory disease. We present a case of severe primary refractory TTP with insufficient platelet response to PEX and rituximab therapy. Case Report/ Description: A 37-year-old lady, complaining of fever and malaise for two weeks. She had jaundice and petechial rash on her bilateral lower limb. Her haemoglobin was 8.9 g/dL; platelets 8 x 109 /L, with raised reticulocytes and LDH. Schistocytes and nucleated red blood cells were easily observed on peripheral blood smear. Throughout admission, she developed one episode of seizure in ward. This patient fulfils PLASMIC score of 7 thus, ADAMTS13 assay revealed 0% activity with >84.17 U/mL inhibitor level. Plasma exchange (PEX) immediately initiated together with corticosteroid. Regrettably, patient's platelets fail to improve despite 8 cycles of PEX. Trial of rituximab was given on Day 8, however she succumbed to death a day after. Discussion/Conclusion: Increased anti-ADAMTS13 IgG antibodies are associated with increased mortality in acute TTP especially in patients with very low ADAMTS13 antigen level. This patient's clinical outcome might improve if rituximab was started early as adjunct to PEX. Recent insights into TTP pathogenesis have led to the development of novel therapies targeting pathogenic antiADAMTS13 antibody production, von Willebrand factor (VWF)–platelet interactions, and ADAMTS13 replacement. It includes Caplacizumab, aim to reduce platelet aggregation and microvascular thrombosis. Other promising therapies are in development, including plasma cell inhibitors (bortezomib), recombinant ADAMTS13, N-acetyl cysteine, and inhibitors of the VWF–glycoprotein Ib/IX interaction (anfibatide). With more knowledge of these new treatments efficacy and success rate, they could be included to the growing literature and debate on reconsidering standardised treatment for TTP.

Abstract no 10

Determination of the cut off value for iron deficiency anaemia with full blood count indices in Hospital Slim River

Prathiba Balai Kerishnan[1,2], Mohd Jaamia Qaadir Mohd Badrin[1] Norpazila Yaacob[2]

[1]Faculty of Health Sciences, University Selangor, [2]Pathology Department, Hematology Laboratory, Hospital Slim River

Introduction: Anaemia can be characterised by a decrease in the total amount of haemoglobin or the number of red blood cells. Iron deficiency anaemia (IDA) is the most common cause of anaemia. Laboratory investigations for basic anaemia begins with full blood count which consist of red blood cell indices namely mean cell volume (MCV), mean cell haemoglobin (MCH), mean cell haemoglobin concentration (MCHC), red blood cell (RBC) and red cell distribution width (RDW) whereby, for the biochemical testing it is iron studies. Objective: The main objective of our study is to determine the cut off value for iron deficiency anaemia with full blood count indices in adult population of Hospital Slim River. Our study will be a practical guideline to the clinician for a faster diagnosis of IDA with the use of FBC indices and iron studies which are readily available from the automated blood cell counter. Methodology: This study analysed 98 iron studies results of adult

population aged 18-60 years old who have been investigated for IDA from January 2019-October 2020. All secondary data of above laboratory tests were entered in Statistical Package for Social Science (SPSS). Sensitivity, specificity, negative/positive predictive value, likelihood positive/negative and receiver operating characteristics (ROC) curve were calculated. Based on ROC curve analysis, all of the parameters investigated in this study yielded moderate accuracy and are acceptable for a screening tool of IDA. Results: The cut off value of RBC with > 4.48 is negative for IDA, RDW with > 18.5 is indicative of IDA. MCH and MCV were the highest accuracy with the cut off value of ≤21.2pg and ≤ 69.2fl to determine IDA. Area under curve (AUC) showed 0.80 and 0.78 respectively. Conclusion: The cut off value for IDA in HSR has been determined and the data in this study served as database in our laboratory practice.
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Abstract no 11

COVID-19 infection or vaccination triggers leukemogenesis/clonal lymphoproliferation in genetically predisposed individual. Myth or Fact?

Komalah Thevii Rajenderan[1], Kalaichelvi A.V Muthiah[1], Kamini Kirubamoorthy[2], Ho Sook Yee[2]
[1]Department of Pathology,Hospital Raja Permaisuri Bainun,Ipoh; [2]Department of General Medicine ,Hospital Raja Permaisuri Bainun,Ipoh

The coronavirus disease 19 (COVID-19) is a highly transmissible viral infection caused by SARS-CoV-2 virus, which caused global pandemic in early 2020. It was first reported in Wuhan, China causing cluster of pneumonia cases worldwide. The severity of the disease ranges from mild to fatal with severe acute respiratory distress syndrome and respiratory failure. It affects all age group. Most patient with COVID-19 recovers within 2-6weeks, however some patients have symptoms that lingers for months. A hypothesised theory was an abnormal immune response to viral infection indirectly trigger secondary mutational mechanism that promote leukemogenesis and lymphoproliferation. Meanwhile WHO and FDA initially approved 4 types of COVID-19 vaccines, they were Pfizer-BioNtech and Moderna (mRNA vaccines), Novavax (protein subunit vaccine) and Johnson & Johnson's Janssen Covid 19 vaccine (viral vector type) and subsequently Astra Zeneca, Sinovax, CansinoBio were introduced later. These vaccines have undergone the most intensive trials in United States of America (USA) and demonstrated a good safety profile in general population. Nevertheless potential haematological related complications were reported. It was also hypothesised that the chronic low-grade inflammation after COVID-19 infection cause DNA damage and multi-system delayed hyper- inflammatory syndrome contributed by COVID-19 vaccine especially with mRNA type vaccine have link for the development of malignancy. Many aspects of COVID-19 infection and vaccination related complication are still unclear. Herein we have 2 case reports a high-grade B-cell Lymphoma developed 1 month post Covid-19 infection and B-Lymphoproliferative disorder (Chronic Lymphocytic Leukaemia) developed 9 months after receiving COVID-19 vaccination (Pfizer-a mRNA type). In this context, we aim to raise concern on probable association and consolidate our knowledge.

Abstract no 12

IgG-4 related disease as a mimicker of paraprotein band

Muhamad Syahmi Nazli[1], Mohd Jamsani Mat Salleh[2]
[1]Chemical Pathology Unit, Department of Pathology, Hospital Pulau Pinang, Pulau Pinang; [2]Chemical Pathology Unit, Department of Pathology, Hospital Seberang Jaya, Pulau Pinang

Introduction: Immunoglobulin G4-related disease (IgG4-RD) is an immune-mediated fibro-inflammatory condition that is capable of affecting multiple organs. The exact prevalence of IgG4-RD is unknown, partly because of diagnostic challenges, however the recognition of the disease continues to grow recently. Case report: A 64-year-old man presented with rapid deterioration of kidney function and frothy urine, with normal haemoglobin and calcium level. Investigations to rule out myeloma were sent. Bone marrow aspirate shows patchy hypercellular marrow with 6% plasma cells, trephine biopsy shows patchy hypocellular marrow with scattered plasma cells and immunophenotyping shows 0.5% plasma cells. Initial serum protein electrophoresis (SPE) and immunofixation (IFE) show a sharp and discrete IgG Kappa-Lambda paraprotein band at fast-gamma region on background of polyclonal increase in gamma globulin with serum free Kappa/Lambda (κ/λ) ratio of 5.02. However, the renal biopsy shows acute on chronic tubulointerstitial nephritis with mature plasma cells exhibiting an increase in IgG4 staining admixed with fibrosis, in keeping with IgG4-RD. Serum IgG4 level done at a private lab shows a raised level (>3.93 g/L). He was started on oral Prednisolone 30mg daily and was responding well. The repeated SPE and IFE show a broad, homogenous band at fast-gamma region, suggesting the previously reported paraprotein band was a pseudo-paraprotein band. Discussion: The pathogenesis of IgG4-RD is unclear and the symptoms or signs are nonspecific. The hallmark of IgG4-RD is a dense, polyclonal, lymphoplasmacytic infiltrate enriched with IgG4-positive plasma cells, storiform fibrosis, obliterative phlebitis and elevated serum IgG4 concentrations. IgG4-RD has a characteristic SPE pattern that may mimic monoclonal paraprotein in the fast-gamma region and may show an increase in serum free κ/λ ratio, which can pose a substantial diagnostic pitfall for laboratory personnel. Hence, performing an appropriate biopsy and measuring serum IgG4 levels in a clinically suspicious patient can be helpful in diagnosing IgG4-RD.

Abstract no 13

A rare case of urinary tract infection caused by a mucoid *Salmonella Stanley* in a child with congenital megaureter and bilateral hydronephrosis.

Anis Roziana Mohmad[1], Muhammad Amirul Faris Zulkafli[1], Zarifah Zam[1], Julina Abdul Aziz[1]
[1]*Microbiology Unit, Department Of Pathology, Hospital Taiping, Perak, Malaysia*

Introduction: Non Typhoidal Salmonella (NTS) is primarily known to cause enteritis and rarely cause urinary tract infection (UTI). We report a boy with congenital megaureter with bilateral hydronephrosis who presented with UTI secondary to *Salmonella* enterica serovar *Stanley*. Case Report: An ex premature boy with congenital megaureter and bilateral hydronephrosis presented with history of passing out cloudy and foul-smelling urine. The urine culture grew a significant bacteria growth which appeared as mucoid, non-lactose fermenter, oxidase negative gram-negative bacilli. It was identified as *Salmonella* species by VITEK GN and MALDI-TOF. *Salmonella* serotyping was executed and detected as *Salmonella Stanley*. The patient was successfully treated with one week course of intravenous ceftriaxone and no growth was obtained on repeated urine culture. Discussion: *Salmonella* UTI is uncommon and majority of cases reported was highly associated with chronic diseases, immunosuppression, or structural abnormalities of the genitourinary tract. In this case we isolated an infrequently found mucoid *Salmonella* which can be misidentified as other Enterobacterales. Furthermore, as the diagnosis was UTI, *Salmonella* UTI was least suspicious as the colony morphology was not favouring *Salmonella* spp. Vitek GN, MALDITOF and serotyping confirmed the identification as *Salmonella* sp. *Salmonella* sp can cause UTI directly by haematogenous, fecal contamination of urethra, urolithiasis, or secondary intraluminal ascending infection. Hence mucoid colony in a patient with congenital genitourinary abnormality presented with UTI, *Salmonella* should be suspected and identified.

Abstract no 14

A case of acute Epstein Barr infection with aplastic anaemia

Chitranjini Nadaraja[1], Nurul Adani binti Annas [2], Law Boon Tat [2]
Hospital Teluk Intan.

Introduction: Aplastic anaemia is a marrow disorder characterised by pancytopenia. Here, we report a paediatric case. Case History: A 3-year-old boy presented with fever, bruising and headache. On examination, the child was pale, with palpable cervical lymph nodes and hepatomegaly. A full blood count noted pancytopenia with poor retic response. Blood film showed the presence of atypical lymphocytes. C-Reactive protein (CRP) was elevated. Trephine biopsy showed markedly hypocellular marrow spaces with no excess of blasts. Biopsy was concluded as aplastic anaemia. Epstein Barr Virus (EBV) IgM and EBV Polymerase chain reaction (PCR) were detected from serum. The child received blood product transfusions, remained pancytopenic and was referred to a haematologist. Discussion: Aplastic anaemia (AA) is an immune-mediated marrow failure. The pathogenesis of AA involves the activation of cytotoxic T- lymphocytes (CTL). AA associated with EBV infections may be persistent and curative treatment would be a marrow transplant. A case report published by Wasekar *et al*.[1] described the use of cyclosporin (CSA) and immunosuppressive therapy (IST) in a patient. Given the patient's age, he was further investigated to exclude inherited marrow failure. EBV infection is to be considered in young children when the presence of atypical lymphocytes is observed.

Reference:

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Abstract no 15

A case report: Challenges in diagnosing acquired thrombotic thrombocytopenic purpura in paediatrics

Syaimaa Ahmad, Mohd Zamri Mohd Hayat, Liza Dat, Noorliza Mat Arif
Hematology Unit, Department of Hematology, Hospital Tuanku Fauziah, Kangar

Introduction: Acquired thrombotic thrombocytopenic purpura (TTP) is rarely seen in paediatrics and is life-threatening without prompt treatment. This patient commonly comes with incomplete classic features of TTP/HUS, such as thrombocytopenia, microangiopathic haemolytic anaemia, acute kidney injury, fever, and central nervous system involvement. Hence prompt diagnosis without ADAMTS13 assay poses a huge challenge. **Case report:** A 10-year-old boy with normal Glucose-6-phosphate dehydrogenase status presented yellowish discoloration and anaemic symptoms only for three days without previous history of infection. Physical examination revealed pale, jaundice, and tachycardia. The full blood picture (FBP) showed severe anaemia with many nucleated RBCs, 6% reticulocytes and 16% schistocytes, and severe thrombocytopenia. His haemato-immunology test showed no clinically significant antibody present. An FBP impression of MAHA needs to be considered was given. In contrast, the serum creatinine is within normal levels, and mildly increased serum urea. His urine and blood culture were no growth. At the same time, immune markers were positive for ANA, anti-betaglycoprotein IgG, and Anti Sm. Then the patient was started with methylprednisolone for a provisional diagnosis of atypical haemolytic uremic syndrome and received nine packed red cell transfusions without plasma or platelet transfusion. His disease progression is plateauing. A week later, the clinician requested ADAMTS13 after no conclusive diagnosis of the haemolysis, and the result was an absence of activity with a present inhibitor of 39 U/ml. The diagnosis was then changed to acquired TTP. The patient's haemoglobin and platelet levels have normalised after immunosuppression was given for five months. Discussion: Such this case, pathologists must not exclude the diagnosis of acquired TTP in paediatrics even though the clinical history is not a classical finding. Other autoimmune diseases also can overshadow the underlying acquired TTP. Thus, an early assay for ADAMTS13 is vital since the prognosis is poor in late and improper treatment.

Abstract no 16

Prevalence Of G6PD deficiency in neonates and verification of cord blood reference range using OSMMR2000-D – A tertiary hospital experience

Sarah Abdul Halim[1], Dhamirah Nazihah bt Mohd Nasiruddin[1], Norlelawati A. Talib[1]
[1]Department of Pathology and Laboratory Medicine, Kuliyyah of Medicine, Sultan Ahmad Shah Medical Centre @IIUM, International Islamic University Malaysia, 25200, Kuantan, Pahang.

Introduction: Glucose-6-phosphate-dehydrogenase (G6PD) produces nicotinamide-adenine-dinucleotide-phosphate (NADPH), which protects against oxidative stress. The prevalence of G6PD deficiency in Malaysia is 3.4%. Our centre has opted for quantitative G6PD assay to overcome the disadvantages of the national screening method, the fluorescent spot test (FST). This study aims to verify the reference range for cord blood using OSMMR2000-D G6PD Assay, establish the prevalence of G6PD deficiency in our local population and compare the G6PD activity of female and male neonates. Methodology: This was a retrospective cross-sectional study involving 666 cord blood samples sent over a four-month period to the Haematology Laboratory of Sultan Ahmad Shah Medical Centre (SASMEC @IIUM) Kuantan for G6PD assay. The samples were assayed using OSMMR2000-D G6PD Assay. Verification of the reference range was done by analysing twenty random specimens. G6PD activities of each sample were recorded and analysed using the statistical package programme (SPSS) version 28.0. Results: This study population comprised 320 (48%) female and 346 (52%) male neonates. Most of the neonates were Malay (88.4%), followed by Chinese (8.4%), Indian (1.1%) and others such as Arab (2.1%). The reference range was verified as out of the twenty samples, no more than 2 samples fell outside the normal reported limit, hence the reference range was valid. The mean G6PD activity overall was 12.062 U/gHb. The mean G6PD activity for female neonates was 12.213 U/gHb, whilst for male neonates was 11.921 U/gHb. There was no significant difference between male and female neonates ($p>0.05$). The overall prevalence of G6PD deficiency when assayed using OSMMR2000-D is 3.9%. Discussion: This study has verified the reference range for our centre and confirms that G6PD prevalence in our local population is comparable to national prevalence. There is no significant difference between the mean G6PD activity of male and female neonates, indicating that no gender-adjusted reference range is necessary.

Abstract no 17

Acute myeloid leukaemia with BCR-ABL1 versus chronic myeloid leukaemia in blast crisis: A case series

Nor Nazuha Mohamad[1], Nurul Atiqah Abdul Ghani[1], Sanada Abu Bakar[1], Tan Jenq Tzong[2], Mimi Azura Aziz[3], Siti Sharum Muhamed Said[3], Noria Abdul Mutalib[4], Ermi Neiza Mohd Said[5]
[1]Hematology Unit, Pathology Department, Hospital Taiping; [2]Medical Department, Hospital Taiping; [3]Hematology Unit, Pathology Department, Hospital Tunku Azizah; [4]Genetic Laboratory, Pathology Department, Hospital Pulau Pinang; [5]Hematology Unit, Cancer Research Centre, Institute Medical Research

Introduction: Acute myeloid leukaemia (AML) with BCR-ABL1 is a provisional entity in the WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues Revised 4th Edition (2017); under sub type of AML with recurrent genetic abnormalities. Its features may overlapped with chronic myeloid leukaemia in blast crisis (CML-BC) especially in patient with no evidence of CML. Case Series: Case 1: A 45 year-old gentleman, presented with bleeding episode. Clinically no hepatosplenomegaly or lymphadenopathy. Full blood picture (FBP) showed marked leucocytosis with basophilia (2%) and 45% blasts. Bone marrow aspirate was dry tap; trephine biopsy and immunophenotyping study showed increase in blast consistent with acute myeloid leukaemia. Molecular and fluorescence in situ hybridisation (FISH) study detected BCR-ABL1 fusion gene. However, no Philadelphia (Ph) chromosome captured by cytogenetic analysis but revealed t(8;12)(q13;p13). Final diagnosis was AML with BCR-ABL1. Case 2: A 16-year-old boy, presented with fever. Clinically patient had lymphadenopathy and splenomegaly. FBP showed hyperleucocytosis with 44% blasts and eosinophilia. Bone marrow aspirate, trephine biopsy and immunophenotyping study were consistent with mixed-phenotype acute leukaemia T-/Myeloid. BCR-ABL1 fusion gene and Ph chromosome were detected. Final diagnosis was CML-BC. Discussion: BCR-ABL1 fusion gene is a hallmark for CML diagnosis. However, it can also be seen in acute lymphoblastic leukaemia (ALL) and rarely de novo AML with BCR-ABL1. Diagnosis of AML with BCR-ABL1 should only be made in patient with no evidence of CML and not meeting criteria for mixed-phenotype acute leukaemia (MPAL), therapy-related AML or other AML types with recurrent genetic abnormalities. Other than that, absence of splenomegaly and lower peripheral basophilia (<2%) make the diagnosis of AML with BCR-ABL1 is more likely. Differentiating AML with BCR-ABL1 and CML-BC is not straightforward but may influence course of treatment. More study and evidence are required to established criteria to confirm the diagnosis.

Abstract no 18

Hepatitis E infection in paediatric patients presenting with acute hepatitis of unknown aetiology

Safiah Abdullah[1] Nurul Asshikin Ruslan[1] Rosnadia Ghadzali[1] Sharifah Aina Afzan Syed Aminuddin[1] Rozainanee Mohd Zain[1]
1 Virology unit, Infectious Disease Research Centre (IDRC), Institute for Medical Research (IMR), National Institute of Health Complex (NIH).

Introduction: Hepatitis E virus (HEV) is a waterborne illness like Hepatitis A causing acute, fulminant hepatitis. According to WHO, there are about 20 million HEV infections worldwide yearly, causing about 3.3 million symptomatic cases of Hepatitis E. With rising cases of acute hepatitis among paediatric patients all around the world in 2022, this global disease burden must be investigated. Therefore, this study was done to determine the prevalence of HEV in paediatric patients presenting with acute hepatitis of unknown aetiology. Methods: A cross-sectional study was conducted at the Institute of Medical Research (IMR). Serum/plasma samples were collected from paediatric patients presenting with acute hepatitis symptoms with elevated transaminases from May 2022 until March 2023. A total of 72 samples were sent to IMR for the Hepatitis E virus IgM test from all hospitals in Malaysia. The serum/plasma was tested for anti-HEV IgM by an enzyme-

linked immunosorbent assay (ELISA) using the Wantai and BT LAB HEV IgM ELISA kit. Results: Out of 72 samples, 10 (13.9 %) were reactive for anti-HEV IgM. Most of the samples were non-reactive (86.1%). The ratio of male to female patients is 1:1. Analysis of ethnicity showed 75% of samples were Malay, followed by Chinese (15.3%), other ethnicities (5.6%), and lastly Indian (2.8%). Many samples came from Kuala Lumpur (38.9%) and it has the highest reactive HEV IgM test (40%). Preschool children (34.7%) were charted as the highest group of samples received and reactive for HEV IgM followed by infants and then school children. Discussion/ Conclusion: The prevalence of HEV in acute hepatitis of unknown aetiology among paediatric population of Malaysia is low (13.9%). Lower than the reported seroprevalence from a study done in Malaysia previously, hence ruling out HEV from the list of main culprits.

Abstract no 19

***Fereydounia khargensis*: An emerging multi-drug resistant yeast**

Thilagam A/P Rajandran[1]

[1]*Microbiology Unit, Department of Pathology, Hospital Bintulu, Sarawak.*

Introduction: The number of fungal infections associated with multi-drug resistant yeast is increasing, mainly due to growing population of immunocompromised patients and advanced identification techniques. We report to our knowledge, the first case of *Fereydounia khargensis* fungaemia in Hospital Bintulu. Case Report: A 62-year-old lady with diabetes presented to our hospital with worsening right hyphocondric pain. She was febrile and tachycardic upon admission. A CT-abdomen revealed evidence of gallbladder empyema with features of cholangitis and choledocholithiasis. The initial aerobic blood culture that was performed was positive after 72 hours incubation. Gram stain revealed yeast elements. Intravenous fluconazole was started. Patient underwent a percutaneous cholecystostomy on day five of admission and was keeping well following procedure. Blood was inoculated onto Sabouraud's Dextrose Agar (SDA) following gram stain findings. Colonies at 48 hours were noted to be cream coloured, dry with wrinkled margins. Days later, the colonies started producing melanin-like pigmentation. Further work out and assimilation tests were carried out with API 20C AUX (bioMérieux) in our laboratory. Results at 72 hours showed *Cryptococcus neoformans* (98% probability). We were not convinced with the identification, and therefore isolate was sent to reference laboratory for further confirmation. Primary team was informed and fluconazole was continued. Patient's clinical condition improved after ten days of antifungal. Polymerase chain reaction (PCR) was performed and resulted in a 99.9% match for *Fereydounia khargensis*. In vitro susceptibility testing exhibited resistances to polyenes and ecchinocandins; but sensitive to azoles. Discussion/Conclusion: In summary, *Fereydounia khargensis* is an uncommon opportunistic yeast. Observation of macroscopic and microscopic characteristics provides clue to their atypical features. We have to be aware that misidentification of this yeast can occur using API or VITEK 2 system. Correct identification is crucial for management and can be made possible by PCR sequencing.

Abstract no 20

Ocular sporotrichosis- Uncommon presentation

Susilahwati Muhammad[1], Ameerah Nabilah Bt Azhar Hilmy[1], Nurul Izzah Md.Din[1]

[1]*Department of Medical Microbiology and Parasitology, Hospital Raja Perempuan Zainab II, HRPZ, 15586 Kota Bharu, Kelantan, Malaysia*

Introduction: Ocular sporotrichosis is rare in Malaysia, but reports have been increasing in recent years. Case description: A 66-year-old woman with underlying hypertension presented with 2 weeks duration of painful swelling on the medial side of right lower lid. She had previous contact with fungal infected cat at her household. Otherwise, no specific history of injury. Ocular examination revealed granulomatous lesions involving the superior and inferior fornix of the right eye. She was initially treated with intravenous Amoxicillin-clavulanate for dacryocystitis. However, the lesion subsequently ruptured, necessitating bedside incision and drainage. Pus culture was yielded *Sporothrix schenkii* Complex based on white glabrous surface texture colony on PDA, while microscopically shows clusters of conidia at the apex of conidiophore which appears as "rosette-like" structure. She was treated for three weeks with oral fluconazole and itraconazole eye drop. Discussion: Sporotrichosis classically known as 'rose-gardener' disease since it is transmitted primarily via inoculation of contaminated soil. Zoonotic transmission is rare. Interestingly, majority cases in Malaysia transmitted via cat scratch and bites. *Sporothrix schenkii* is the prevailing causative agent of feline sporotrichosis. Ocular involvement is considered rare and usually preceded with history of trauma. Due to its rarity and various clinical manifestations, sporotrichosis is frequently misdiagnosed with other eye disease. The gold standard in obtaining the definitive diagnosis of sporotrichosis is by culture of the lesions. Sporotrichosis in ocular adnexa is treated with oral itraconazole in the same dose as the cutaneous form. Conclusion: Clinicians should be aware of this emerging zoonotic infection transmitted by infected felines as it is reversible with prompt diagnosis and commencement of the right anti-fungal therapy.

Abstract no 21

Erythroid precursors mimicking abnormal lymphoid

Dr Zubaidah Ahmad

Pathologist Hospital Shah Alam, Ministry of Health, Malaysia.

Introduction: Erythroid hyperplasia with increased erythroid precursors may give a false alarm on the morphological interpretation. Typical erythroid series are easy to recognizs but its precursors may present with monomorphic population of large immature blastoid cells[1], thus required proper and extensive work-up to exclude malignant cause. The use of immunostain specific to early pro-erythroblasts are vital to demonstrate these cells, therefore excluding the other differential diagnosis. Case report: A 24-year-old gentleman previously well, presented with acute abdomen associated with abdominal distension and fever (for 2 weeks), loss of appetite and loss of weight (3 kg/month). Noted on CT scan, presence of multiple

lymphadenopathy at para-aortic, para-caval and mesenteric region with bilateral pleural effusion. FBP showed bicyopenia (HB:7g/dl, Platelet: 20) and leucocytosis, with neutrophil predominant. Coomb test was positive (IgG:2+/C3d:negative) with poor retic response. LDH was increased. Tumour markers and TB worked-up were negative. Bone marrow could not be aspirated and imprint was unhelpful. Trephine biopsy revealed mild hypercellular marrow with erythroid hyperplasia and presence of large immature blastoid-looking cells. These cells showed round to oval vesicular nuclei, smooth nuclear contour, prominent nucleoli and moderate amount of clear cytoplasm, dispersed interstitially and some forming loose cluster. They were negative to B- and T-cell markers, immature markers, ALK, cyclin D1, plasma cells and NK cell markers. However, it was immunoreactive to E-cadherin and CD71. Proliferation index was extremely low (<1%). Other haematopoietic cells were adequate and normal morphology. No lymph nodes biopsy done due to unstable condition. He then developed *ESBL Klebsiella* sepsis and *MRO acinetobacter* HAP with lung empyeme. His condition deteriorated which required ICU admission and haemodialisis support. He finally succumbed to death due to severe sepsis with multi-organ failure. Discussion: Aggressive presentation and widespread lymphadenopathy, with bone marrow morphological assessment showed large immature blastoid looking cells, hence the diagnosis of malignant lymphomatous infiltration needs to be considered[2]. Thorough investigations using immunohistochemical staining are essential to come into tissue diagnosis. The differential diagnosis include DLBCL, plasmablastic lymphoma, ALK large B-cell lymphoma, Hodgkin lymphoma and aggressive variant of mantle cell lymphoma[2]. Extensive work-up for these diagnosis, result in erythroid markers are frequently be missed/forgettable. The use of E-cadherin and CD71 are useful because its stain early proerythoblast very consistently[1,2,4]. In bone marow samples, glycophorin A is specific for eryhtroblasts but is poor marker of the early stages of erythroid maturation and it does not stained very early proerythroblast[3]. Conclusion: Exact tissue diagnosis is essential for definitive management. Correct use of immunohistochemical staining will aid the diagnosis. Routine stains for lymphoid, plasma cells, NK cell lineages, histiocytes and non haematological malignancies may be unnecessary if these population of early proerythroblasts are recognised early.

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Abstract no 22

A case of refractory anaemia in newly diagnosed β-thalassaemia major complicated with autoimmune haemolytic anaemia

Siti Umairah Abd Rahman[1,2], Claudia Cassandra Stephen[1], Rashidah Mohamed[1], Wan Nurul Husna Wan Alkamar Shah[1], Faridah Idris[2]

[1]Blood Transfusion Unit, Department of Pathology, Hospital Ampang; [2]Department of Pathology, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

Introduction: Thalassaemia is the most common inherited blood disorder characterised by defective globin production resulting in premature destruction of erythrocytes. Autoimmune haemolytic anaemia (AIHA), a rare presentation that may occur in thalassaemia patients, is characterised by production of autoantibodies against erythrocytes via several mechanisms such as blood transfusion, infection or drug induced which may complicate management of thalassaemia. Case report: This is a 7-month-old boy newly diagnosed β-thalassaemia major, complicated with AIHA approximately 6 weeks after initiation of blood transfusion. He presented with fever, tachypnoea, and lethargy with haemoglobin (Hb) of 4.6 g/dL. Peripheral blood smear and biochemical markers were suggestive of haemolysis. Direct Antiglobulin Test (DAT) was Positive (IgG 3+, C3d 3+) and antibody identification showed presence of autoantibodies with no clinically significant alloantibodies. He was tested positive for Respiratory Syncytial Virus (RSV), thus treated for RSV Pneumonia. Within the first 14 days of admission, Hb levels were not improving and even dropped down to life-threatening level (2.5 g/dL) despite daily leucodepleted phenotype-matched Packed Cells transfusions and oral Prednisolone. Subsequently, high dose IV Methylprednisolone and Rituximab were administered and Hb level improved to 11.9 g/dL. Repeated DAT showed C3d Negative, and IgG reduced to 2+ suggesting resolution of AIHA which was likely secondary to RSV infection. He was discharged after 21 days of admission with oral Prednisolone and treated as outpatient with 2 weekly blood transfusions as per his underlying β-thalassaemia major management. Discussion: AIHA complicating β-thalassaemia major is easily overlooked despite its seriousness with a mortality rate of 4%. Early recognition of AIHA is crucial as to provide the most effective transfusion regime if it is indicated thus reducing mortality in this group of patients. Immunosuppressive therapy, restrictive transfusion regime of leucodepleted phenotype matched Packed Cells, and eventually splenectomy need to be considered once AIHA is diagnosed.

Abstract no 23

IgG mediated cold agglutinin disease with possible antiphospholipid syndrome and SLE - A case report

Muhammad Hafizuddin Mohamad Aziz, Azura Abdul Hamid
Pathology Department, Hospital Kajang

Introduction: Cold Agglutinin Disease (CAD) is a rare form of autoimmune haemolytic anaemia caused by cold-reacting autoantibodies. The majority of CAD cases are mediated by IgM antibodies, with only a few CAD mediated by IgG antibodies. The co-occurrence of Antiphospholipid Syndrome (APS) and Systemic Lupus Erythematous (SLE) are also uncommon. Case: We report a case of a 25-year-old female who presented to our hospital in acute haemolysis crisis. There was a history of miscarriage four years prior to her current admission. Patient had hepatosplenomegaly with haemoglobin of 3.1g/dL, increase indirect bilirubin, thrombocytopaenia, mild leucopaenia, reticulocytosis (22%), increase LDH with positive direct and indirect Coombs test (3+). Blood film showed increased polychromasia with some spherocytes and occasional nucleated RBCs with mild presence of small red cell agglutinations. Mycoplasma pneumonia antibody was positive. Anti-Nuclear antibody and anti-dsDNA were positive with low C3 and C4 levels. PT/APTT were prolonged with APTT not corrected by mixing study. Lupus anticoagulant result was positive. Immunohematology test revealed presence of auto-IgG which reacted at room temperature and 4°C but dissappeared at 37°C. Findings were consistent with Cold autoimmune disease with possible antiphospholipid syndrome with underlying SLE. Discussion/ Conclusion: The positivity of ANA, dsDNA with low C3 and C4 and presence of all haematology criteria were compatible with SLE diagnosis. In view of pregnancy morbidity that occurred less than 5 years ago with current positive lab result, APS can be considered in this case. There is a possibility that this patient was underdiagnosed all this while until she presented with this severe haemolytic episode triggered by current underlying infection. A course of IV steroid followed by Prednisolone together with antibiotic and folinic acid were commenced. 2 units of packed red cells transfused and her clinical condition improved with Hb of 7.2 g/dL prior discharged.

Abstract no 24

Improving the specimen packaging procedures for transporting specimen to referral laboratories

Alia Nasriana Nasuruddin, Shalwani Shamsudin, Norhanan Hamzah, Norafisah Mohd Arshad, Rabiah Ismail, Rabiatul Adawiyah Yusof, Azlina Abdul Rahman
Department of Pathology, Hospital Tengku Ampuan Afzan, Kuantan, Pahang

Introduction/ Background: Consolidation and centralisation of laboratory testing is part of laboratory stewardship to optimize the healthcare resources. Maintaining cold chain while transporting the specimens to the referral laboratory is challenging in remote settings but is crucial to prevent sample degradation to ensure accuracy of laboratory results. Department of Pathology, Hospital Tengku Ampuan Afzan has recently changed the referral specimen transport system from hospital transport to private postal service. Monitoring the transportation temperature using electronic data loggers was not feasible with the new system. Preliminary stability study performed before we convert to the new system showed that the existing packaging procedures were only able to maintain the internal temperature of the coolers for 34 to 37 hours. Thus, the objective of this study was to optimise the specimen packaging procedures to maintain the required optimal temperature [20-24 °C (whole blood), 2-8°C (whole blood), 2-8°C (frozen specimen) and -20 °C] during transportation to the referral laboratories for at least 48 hours. Methodology: Specimens were packed in polystyrene foam coolers of varying sizes for each temperature range required and stored in 26-33°C. Electronic temperature data loggers were used to monitor and record temperatures of each cooler for 96 hours. Results: The internal temperature of all coolers were maintained within the required temperature range for at least 48 hours. Discussion/ Conclusion: Validation of specimen packaging procedures is important to ensure specimen integrity during its transport. The packaging procedures in this study have been proven to be effective in maintaining the required transportation temperature. We believe this data may be useful in the planning and design of specimen transportation system in other referring laboratories.

Abstract no 25

Fatal neonatal melioidosis: A case report

Amal Hanani Abdul Halim[1], Wafa Wasimah Wajihah Saijan[1], Aliah Abdul Rahman[1]
[1]Microbiology Unit, Department of Pathology, Sabah Women and Children Hospital, Sabah, Malaysia

Introduction: Melioidosis is an infectious disease that rarely occurs in neonates. It is usually acquired through contact with contaminated soil or water supplies by *Burkholderia pseudomallei*. Presenting symptoms vary from fever, abscess, flu-like symptoms to respiratory distress and shock. We report a fatal case of neonatal melioidosis septicaemia and meningitis in our centre. Case description: Day 12 of life, baby boy, born term via vacuum-assisted delivery with good birth weight and unremarkable antenatal history, was brought to our Emergency department (ED) for fever for 2 days and 1 episode of vomiting. He was diagnosed with viral fever and discharged home with syrup Amoxicillin. Two days later, he was rushed to ED for rapid breathing and persistent fever. Chest X-ray shows generalised haziness and blood culture was sent. He was admitted for community acquired pneumonia, placed on continuous positive airway pressure (CPAP) and started on Intravenous (IV) Cloxacillin and IV Gentamicin. Patient was intubated the following day due to worsening respiratory distress and antibiotics escalated to IV Cefotaxime. Blood and tracheal aspirate culture grew *Burkholderia pseudomallei* after 24-48 hours. Antibiotics changed to IV Ceftazidime and then escalated to IV Meropenem when patient's condition deteriorated further, developing septic shock, meningitis, acute kidney injury, transaminitis and coagulopathy. Patient unfortunately succumbed at day 6 of admission. Cerebrospinal fluid culture from post-mortem lumbar puncture grew *Burkholderia pseudomallei*. Patient was cared by parents in good hygienic environment with no history of Melioidoisis outbreak in the residential area. Expressed breast milk (EBM) culture from mother was negative for *Burkholderia pseudomallei*. No source of the organism was found.

Discussion: Diagnosis of Melioidosis is a challenge in neonates and usually not suspected until culture results are obtained. Melioidosis should be considered in rapidly deteriorating pneumonia with multi-organ failure as delay in starting specific antibiotic treatment leads to poor prognosis.

Abstract no 26

Invasive shigellosis associated with intrauterine death: A case report of diagnosis dilemma

Wafa Wasimah Wajihah binti Saijan, Amal Hanani binti Abdul Halim, Aliah binti Abdul Rahman
Microbiology Unit, Department of Pathology, Sabah Women and Children Hospital, Sabah, Malaysia.

Introduction: Shigellosis is an important public health issue in developing countries, caused by the bacterium *Shigella*. Cases are seen in areas with poor sanitation and are associated often with gastrointestinal disease rarely with bacteraemia. We report a case of *Shigella flexneri* bacteraemia associated with intrauterine death (IUD). Case report: A 30-year-old para 2, unbooked, unscreened, with no known medical illnesses presented at a district hospital at 30 weeks of gestation in active labour. She also complained of fever, cough and shortness of breath of one day duration. She delivered via spontaneous vaginal delivery a macerated stillbirth baby boy. Patient's blood and placenta swab was taken for culture and sensitivity (C&S), and were sent to the state hospital for testing. Started on Intravenous (IV) Unasyn, she was then transferred to our centre for sepsis secondary to endometritis, community acquired pneumonia & intrauterine death. Initial cultures grew *Escherichia coli* while repeat blood culture together with High vaginal swab (HVS) and Stool C&S taken in our hospital grew *Shigella flexneri*. The organism discrepancy was due to the use of mass spectrometry to identify the organism compared to conventional or molecular methods. Institute of Medical Research (IMR) confirmed the organism to be *Shigella spp*. Her antibiotic was subsequently changed to IV Ceftriaxone for two days and then oral Bactrim for seven days. Patient was unsure of source of infection and denied any gastrointestinal symptoms. She was discharged home well but defaulted further follow-ups. Discussion: *Shigella spp*. are differentiated from *Escherichia coli* on the basis of pathogenicity, physiology and serology. Colonies are similar and mass spectrometry has difficulty to differentiate them. Incorrect identification can lead to misdiagnosis, wrong treatment and death. Invasive shigellosis is uncommon and this is the first known case to the authors in Malaysia to be associated with IUD.

Abstract no 27

Diagnostic pitfalls in neonatal hypertyrosinemia: A case report

Siti Nurwani Ahmad Ridzuan[1], Karniza Khalid[1], Mohd Fazrul Shafiq Kamarudzaman[2], Noor Hafizah Hassan[1]
[1]Special Protein Unit, Institute for Medical Research, Kuala Lumpur, Malaysia; [2]Department of Paediatrics, Hospital Tengku Ampuan Afzan, Kuantan, Pahang, Malaysia.

Introduction: Hypertyrosinemia results from an abnormality in tyrosine metabolism. Acquired hypertyrosinemia is notably more common than inherited types and typically presents with profile suggestive of secondary aetiology on biochemical testing. Case report: Herein, we present an unusual case of a Day 14-of-life baby girl who was screened for inborn errors of metabolism (IEM). She presented with jaundice, hypotonia, lethargy and had hepatomegaly on examination. She was treated for sepsis with multiorgan involvement - severe transaminitis, conjugated hyperbilirubinemia, coagulopathy, thrombocytopenia and hypoalbuminemia, requiring escalation of intravenous antibiotics and assisted ventilation. Her dried blood spot (DBS) showed moderate elevation of tyrosine (408umol/L, N:10-182) with low Phe:Tyr ratio (0.15umol/L, N:0.32-3.45). Plasma amino acid showed isolated hypertyrosinemia at 807umol/L (N:5-167) with mild, non-significant elevations of other liver metabolites. No succinylacetone peak seen with urine organic acids, making the diagnosis of inherited Tyrosinemia type I less likely despite the characteristic findings from DBS, plasma amino acids, and the presenting clinical signs. Repeated IEM screening two weeks later revealed a non-diagnostic profile across both DBS and plasma amino acids in the light of resolving sepsis and clinical improvement. Discussion: This case highlights the challenges associated with incompatible biochemical testing in a child with a high index of suspicion for inherited Tyrosinemia. In our case, repeated screening ruled out inherited Tyrosinemia, suggesting the initial picture of hypertyrosinemia be likely due to liver dysfunction and impaired activity of liver enzymes responsible for tyrosine catabolism. The case is unique as the initial testing did not show classical features of liver derangements on plasma amino acid (no marked elevation of glutamate/glutamine, alanine, glycine and/or methionine), making the suspicion of inherited Tyrosinemia high on our list. Hence, biochemical testing should always be interpreted along with clinical symptoms for an accurate picture. A repeat testing is almost always indicated in such cases.

Abstract no 28

A successful ABO-incompatible living related renal transplant

Jasmine Nazrin, Fatihah Mohd Amin, Sharifah Mai Sarah Syed Azim, Mohd Faeiz Yusop, Norlida Mohamad Tahir, Tengku Norita Tengku Yazid
Department of Pathology, Hospital Selayang, Selangor, Malaysia

Introduction: ABO-incompatible living related renal transplant (ABOi LRRT) is gradually becoming widely accepted worldwide and has achieved remarkable success due to advances in desensitisation techniques and immunosuppressive agents. Monitoring a patient's isoagglutinin titer is the key to achieving a successful ABOi LRRT. Case report: We present a case of a 31-year-old gentleman with underlying Hypertension and End Stage Renal Failure (ESRF) with unknown primary cause, who was planned for an ABOi LRRT in Hospital Selayang. He initially presented with diarrhoea for 2 weeks and upon his visit to hospital, noted his creatinine level was 1000+ umol/L. He was subsequently diagnosed as ESRF and was on Continuous Ambulatory Peritoneal Dialysis (CAPD). An ABOi LRRT was planned for him. His blood group was O positive, whilst the donor's (his biological sister) blood group was B positive. He was followed up in Nephrology clinic and admitted one month earlier prior to the surgery for desensitisation with Monoclonal Antibodies (Rituximab), Double Filtration Plasmapheresis

(DFPP), and Immunoadsorption (IA). Upon admission, his isoaglutinin anti-B titre level was 1:128. After he was given Rituximab, triple immunosuppression (Tacrolimus, Mycophenolate Sodium, and Prednisolone), two cycles of DFPP, one cycle of IA and Intravenous Immunoglobulin (IVIg), his anti-B titre initially reduced to 1:16 but rebounded to 1:32 the next day. Subsequently another cycle of DFPP, IA, and IVIg was given to him but the anti-B titre persisted at 1:32. He then underwent Plasma Exchange (PLEX) and was given another dose of IVIg which reduced his anti-B titre to 1:4. With the achievement of this titre, the team proceeded with the transplantation. His urea decreased from 23.3 mmol/L to 6.3 mmol/L while creatinine from 1672 umol/L to 87 umol/L. He was discharged home well with an anti-B titre of 1:8. Subsequent follow ups in the Nephrology clinic revealed that he was recuperating well post-surgery. Discussion: Hospital Selayang is the second out of three hospitals in Malaysia that provide ABOi LRRT which was started in 2020. ABOi LRRT can cause hyperacute rejection; however due to advances in desensitisation techniques and immunosuppressive agents such as PLEX, DFPP, IA, Rituximab, IVIg, Tacrolimus, Mycophenolate Sodium, and Prednisolone it leads to a promising outcome for the last decade. In this study, we report our experience with the patient who has a very high isoagglutinin titre pre-operatively with multiple rebounds of the anti-B titre level, despite various therapies given. This case was the first immunoadsorption performed in Hospital Selayang and illustrated the importance of multidisciplinary approach in managing the patients.

Abstract no 29

Role of bone marrow examination in the evaluation of fungal infections

Fatihah Binti Mohd Amin, Sharifah Mai Sarah Syed Azim, Norlida Mohamad Tahir, Tengku Norita Tengku Yazid
Department of Pathology, Hospital Selayang, Selangor, Malaysia.

Introduction: Bone marrow examinations may be helpful in diagnosing fungal infection. Case Report: First case, a 51-year-old gentleman with no known premorbid, presented with a three months history of loss appetite, loss of weight, lethargy and non itchy rash over the face and trunk. Physical examination revealed bilateral cervical lymphadenopathy and hepatomegaly. Complete blood counts showed pancytopenia with haemoglobin of 6 g/dL, total leukocyte count of 2.54×10^9/L, and platelet count of 19×10^9/L. Peripheral blood smear demonstrated no abnormal cells. Serum lactate dehydrogenase was high and he was positive for HIV serology. Fungal culture of the blood showed no growth after 14 days of incubation. Subsequently bone marrow and trephine biopsy showed intracellular fungal organisms morphologically suggestive of histoplasmosis. Bone marrow fungal PCR confirmed the diagnosis of Histoplasma Capsulatum. Second case, a 32-year-old gentleman with no known premorbid, presented with shortness of breath for one week, feverish and reduced effort tolerance for one-month, loose stool for six months and loss of weight for eight months. Full blood count showed pancytopenia with haemoglobin of 8.2 g/dL, total leukocyte count of 2.30 × 109/L, and platelet count of 111 × 109/L. Peripheral blood smear showed no abnormal cells. He was positive for HIV during an infective screening test. Blood fungal culture showed no growth. Bone marrow and trephine biopsy showed capsulated yeast form infection, morphologically appearing like Cryptococcus sp. Bone marrow fungal PCR was positive for *Cryptococcus neoformans var. grubii*. Third case, a 25-year-old gentleman, newly diagnosed retroviral disease, presented with lesions over his face for one week with fever, chills and rigor for two weeks, Full blood count showed pancytopenia with haemoglobin of 6.9 g/dL, total leukocyte count of 2.58 × 109/L, and platelet count of 88 × 109/L and peripheral blood smear showed no abnormal cells. Bone marrow and trephine biopsy showed evidence of fungal infection morphologically suggestive of Talaromyces sp. However bone marrow and trephine culture yielded no fungal growth. Discussion: Bone marrow examination may aid in the diagnosis of rare fungal infections. These cases emphasised the importance of bone marrow examination in prompt diagnosis and management of patients, especially the immunocompromised population.

Abstract no 30

***Listeria monocytogenes* – An organism not to be missed**

Amizah Othman, Nour Amalina Mohd Said
Microbiology Unit, Pathology Department of Hospital Sultanah Bahiyah, Alor Setar, Kedah

Introduction: *Listeria monocytogenes* are facultatively anaerobic, gram-positive organisms, which may cause listeriosis in human. It is a relatively rare disease with 0.1 to 10 cases per 1 million people/ year. Listeriosis is commonly food-borne, but other modes of transmission such as from mother to child transplacentally, through an infected birth canal, or from cross infection in neonatal nurseries. Case report: A premature baby born via spontaneous vaginal delivery with good Apgar score. However, she was noted to be in respiratory distress at 30 minutes of life requiring mechanical ventilation. She was treated as congenital pneumonia and started on intravenous ampicillin and gentamicin. Blood culture collected at day 1 of life yielded *Listeria monocytogenes*. She was given high dose ampicillin (100mg/ kg/ dose). Cerebrospinal fluid investigation is not suggestive of meningitis. She was discharged well at day 19 of life. Discussion: Listeriosis is 18 times more common in pregnancy (12/100,000) than in the non-pregnant population (0.7/100,000), and 16-27% of all infections with Listeria occur in pregnant women. Neonatal listeriosis may occur by vertical transmission, either by inhalation of infected amniotic fluid, transplacentally from the maternal circulation or by ascending colonisation from the vagina. In infants, neonatal infection manifests like group B streptococcal disease in one of two forms: (1) an early-onset sepsis syndrome, associated with prematurity, probably acquired in utero and (2) a late-onset meningitis occurring about 2 weeks post-partum in term babies, most likely infected in the maternal vagina during delivery. In clinical samples, the organism may be gram variable and look like diphteroids, cocci or diplococcic. Laboratory misidentification as diphteroids is not uncommon, and isolation of "diphteroids" from blood or cerebrospinal fluid in neonates should always alert one to consider the possibility of *L. monocytogenes*. Routine media used in the laboratory is effective in isolating *L. monocytogenes*. Identification of Listeria monocytogenes is made possible with laboratory automation.

Abstract no 31

A diagnosis from *two realms*: A case report of primary cutaneous histoplasmosis from the clinical versus laboratory perspectives

Siti Rohani Abdul Hadi[1], Kong Yeow Kang[2], Mohamad Zabidi Awang Kechik[1], Murhafizah Mamat[1], Sharifah Salha Syed Hashim[1], Naim Syahidah Zulkafli[3], Salina Mohamed Sukur[4] & Murnihayati Hassan[4]

[1]Mycology Laboratory of Microbiology Unit, Department of Pathology, Hospital Sultanah Bahiyah, Malaysia; [2]Infectious Diseases Unit, Department of Medical, Hospital Sultanah Bahiyah, Malaysia; [3]Histopathology Laboratory of Anatomic Pathology Unit, Department of Pathology, Hospital Sultanah Bahiyah, Malaysia; [4]Infectious Disease Research Centre, Institute for Medical Research, National Institute of Health, Malaysia.

Introduction: Histoplasmosis is systemic mycoses that frequently infect immunocompromised patients. It can present as mucocutaneous lesion, pulmonary and generalized systemic infection. Case report: We presented a case of 47-year-old immunocompetent patient, complaint of non-healing perianal ulcer for 1-month. Upon examination, there were multiple ulcer erosions at the head of penis and multiple punched-out scally crusted lesions at anterior aspect of the thighs. There was no history of trauma noted. The preliminary diagnosis was chancre as predominant lesion of primary syphilis. Histopathological findings of the skin biopsy from perianal and thigh were suggestive of cutaneous histoplasmosis. Fungal culture was reported as *Histoplasma capsulatum* and isolate was referred to Institute for Medical Research and later confirmed as *Histoplasma capsulatum* via ITS gene sequencing. Patient responded well to oral itraconazole for six weeks regime as definitive treatment for primary cutaneous histoplasmosis. Discussion: *Histoplasma capsulatum* is a dimorphic fungus with tuberculate macroconidia. The morphological resemblance with other fungi namely *Sepedonium species* can be differentiated based on the presence of smooth-wall microconidia that unique to *Histoplasma capsulatum* but absent in *Sepedonium sp*., and *Histoplasma capsulatum* will yield a positive yeast conversion test, but not the other counterpart. Matrix-laser assisted time of flight (MALDI-ToF) and PCR can be utilised for additional confirmatory of identification. In immunocompetent patient, initial diagnosis can be quite difficult without laboratory supportive evidence. Conclusion: Histoplasmosis can infect immunocompetent patient but can be mistaken as other differential diagnosis due to its rarity, however microbiology diagnostic laboratory is able to identify the aetiological agent after successive culture despite the slow growing nature of the organism.

Abstract no 32

Fibrosarcomatous Dermatofibrosarcoma protuberans (FS-DFSP) with myoid differentiation mimicking solitary adult myofibroma (AM)

Kalyani Supramaniam[1], Nurhafidzah Abd Rauf[1], Norashikin Awang Ahmad[2], Norsyahinaz Hashim[2]

[1]Department of Pathology, Hospital Raja Permaisuri Bainun, Ipoh, Perak Darul Ridzuan, Malaysia; [2]Department of Pathology, Hospital Sultanah Nur Zahirah, Kuala Terengganu, Terengganu Darul Iman, Malaysia

Introduction: Dermatofibrosarcoma protuberans (DFSP) is a superficial fibroblastic/myofibroblastic neoplasm which frequently affects young to middle aged adults. Its diagnosis is usually straightforward and based on presence of monomorphic spindle cells with low mitotic activity and classical storiform arrangement. Several subtypes of DFSP have been described with major emphasis on the fibrosarcomatous subtype due to its worse prognosis. Herein, we report one such case with myoid differentiation which mimicked an adult myofibroma (AM). Case report: A 20-year-old Malay gentleman with no known comorbidity presented with left thigh swelling of two years duration. The excised specimen revealed a well-defined dermocutaneous tumour nodule exhibiting a biphasic morphology consisting of (1) monotonous neoplastic spindle cells component with areas of increased cellularity, mitotic activity and fascicular growth pattern and (2) myoid component, raising initially a possibility of an adult myofibroma (AM). However, distinct honeycomb fat infiltration by the tumour supported by diffuse and strong CD34 expression in the non-fibrosarcomatous area of the spindle cell component lead to a diagnosis of fibrosarcomatoid DFSP (FS-DFSP) with myoid differentiation. Discussion: FS-DFSP with myoid differentiation and AM are both superficial, well defined, biphasic neoplasms with myoid component usually located on the trunk and, head and neck region. The fibrosarcomatous element in the former can appear relatively monotonous albeit with brisk mitosis while the spindle cell component in the latter can appear immature, approach cellularity of a fibrosarcoma and display frequent mitosis. Despite their overlapping clinical and histological features, the honeycomb infiltration seen in FS-DFSP with myoid differentiation has never been described for an AM. Also, the former almost always shows diffuse and strong CD34 expression in its non-fibrosarcomatous component as opposed to an AM which is usually negative. In summary, awareness of the occurrence of rare myoid differentiation especially in a FS-DFSP, attention to its pattern of fat infiltration and CD34 expression can potentially avoid a misdiagnosis of a myofibroma, a benign entity.

Abstract no 33

Neonatal Graves' Disease: From the pathologist perspective

Khadijah Noh, Ling JC, M Adib

Department of Pathology, Hospital Seri Manjung, Seri Manjung, Perak

Introduction: Neonatal hyperthyroidism born to mother with Graves' Disease (GD) is a rare disorder, with prevalence of 1.5% to 2.5%, and most cases are transient in nature. However, prompt diagnosis and management are needed due to its potentially fatal clinical sequalae. Case report: We present a case of neonatal thyrotoxicosis. The neonate was born prematurely at 34 weeks of gestation to a mother with GD. She was biochemically hyperthyroid throughout the pregnancy. The maternal TSH receptor antibody (TRAb) status was unknown. The analysis of cord TSH revealed suppressed TSH with elevated free T4 (FT4). The neonate was treated as presumed meningitis and nosocomial pneumonia due to episodes of desaturation, febrile and persistent tachycardic. Thyroid function test (TFTs) on day 9 of life showed biochemically hyperthyroid and TRAb was positive. She was started on anti-thyroid drugs and beta-blocker. Her

condition improved subsequently. Discussion: Signs and symptoms of neonatal hyperthyroidism are nonspecific and could be attributed to congenital viral infections or sepsis as in this case. The diagnosis of neonatal hyperthyroidism can therefore be overlooked. Determination of cord TSH and FT4 cannot predict neonatal hyperthyroidism, however, abnormal result should alarm the clinician to repeat the test at day 3 to 5 of life and day 10 to 14 of life if the results showed euthyroid. If diagnosis is confirmed and treatment is initiated, TFTs should be repeated weekly. Consensus guidelines recommend the determination of maternal TRAb levels at 20 to 24 weeks' gestation in women with GD due to strong correlations between maternal and neonatal thyrotoxicosis. Neonates born to positive TRAb mothers are therefore considered as high risk in developing neonatal thyrotoxicosis. Determination of cord blood or infant TRAb levels is a useful risk assessment biomarker of neonatal thyrotoxicosis where negative TRAb levels is considered as low-risk newborn and can be discharged from follow-up.

Abstract no 34

Misuse of tumour markers at Hospital Tuanku Ampuan Najihah

Muhammad Akmal bin Karim, Noor Amalia binti Bakri, Syazana binti Mohd Kuzi
Department of Pathology, Hospital Tuanku Ampuan Najihah, Kuala Pilah, Negeri Sembilan

Introduction: This study audits the request of tumour marker tests in a major specialist hospital and calculated the financial cost due to misuse of the tests. Beside the costs of the tests, the intention of using tumour markers as screening methods can be falsely reassuring or unduly alarming. Methodology: Laboratory request forms containing more than two tumour markers between 29 Jun 22 until 29 December 22 were compiled and recorded. Tumour markers audited are carcinoembryonic antigen (CEA), Ca-125, Ca19-9, Alpha-Fetoprotein (AFP) and Prostate-Specific Antigen (PSA). Cost due to misuse of the tests were estimated based on cost per reportable of these tests. Results: 277 tumour markers request forms which have more than two tumour markers were analysed during the duration of the study. Request forms with history of having nonspecific signs/symptoms only (example: anaemia, electrolyte imbalance, inflammation, infection, loss of weight, loss of appetite or weakness) is 39.4% (n: 109). Tests requested because of mass is 37.9% (n: 105). 10.1% (n: 28) of the tests are requested due to malignancy while tests requested for having suggestive symptoms (example: specific site obstruction, pathological fracture or liver symptoms) is 12.6% (n: 35). 19.5% of Ca 125 requests were on men and 3.3% of PSA requests on women. The overall cost due to the misuse of tumor marker requests are RM9,658 in 6 months, representing an estimation of RM19,316 per year. Conclusion: Tumour markers are frequently misused for screening purpose and sometimes requested on patients of the wrong sex.

Abstract no 35

Direct fungal identification from formalin-fixed paraffin-embedded (FFPE) using PCR-based method

Murnihayati Hassan[1], Salina Mohamed Sukur[1], Nazifah Adznan[2], Joel Ryan Jokius[1], Muhammad Asyraf Mohd Kamil[1]
[1]Mycology Laboratory, Bacteriology Unit, Infectious Disease Research Centre, Institute for Medical Research, National Institute of Health, Malaysia; [2]Histopathology Unit, Department of Pathology, Hospital Tengku Ampuan Rahimah, Malaysia

Introduction: Fungal culture is the gold standard for fungal identification that require technical expertise, but yet very time consuming. Polymerase chain reactions (PCR) is an alternative culture-free method that is increasingly been utilizsd from direct clinical sample for rapid diagnosis. Institute for Medical Research (IMR) is offering direct fungal PCR from various clinical specimen from sterile site and also formalin-fixed paraffin-embedded (FFPE) specimens. Methodology: In this study, we analysed 66 FFPE samples which were sent from January 2022 till April 2023. Those samples were subjected to deparaffinisation and DNA extraction following the protocol by QIAamp DNA FFPE Tissue kit. PCR was performed using primer sets targeting ITS and LSU regions respectively. Sequencing results were analysed using NCBI BLAST webtool to determine the appropriate genus and species. Clinical data from the request forms were retrieved to correlate with the histopathological examination (HPE) reports. Results & Discussion: Fungal bodies were identified histologically in 43 out of the 66 FFPE specimens, mostly highlighted by PAS (n=16) and GMS (n=19) stains. Fungal PCR successfully identified the fungal genus/species in 40 specimens (16 reported as presence of yeast and /or hyphae in HPE). Fungal PCR identification were unsuccessful / negative in 26 cases, 7 of which reported as fungal elements seen in HPE. Direct PCR helps to confirm the presence of fungus genome and further provide identification of the causative fungus. Result discrepancies observed was partly due the possibility of mimickers histologically or lack of fungal element in the section submitted for fungal PCR testing. Conclusion: Our data exhibit the big potential of direct fungal DNA identification from FFPE samples to assist in clinical diagnosis & treatment direction especially in the absence of fungal culture.

Abstract no 36

Eliminating unnecessary uric acid testing in Biochemistry Laboratory, Hospital Sultan Haji Ahmad Shah (HoSHAS), Temerloh.

Andrian Alif Faisal[1], Norsyakira binti Mohamed Rejab[1], Haslinda binti Rustam Afandi[2]
[1]Chemical Pathology Unit, Department of Pathology, Hospital Sultan Haji Ahmad Shah, Temerloh, Pahang; [2]Department of Pharmacy, Hospital Sultan Haji Ahmad Shah, Temerloh, Pahang

Introduction: In response to the high rate of serum uric acid (UA) requests in our laboratory, we sought to implement a strategy to reduce unnecessary UA testing. Methodology: UA was removed from all preconfigured laboratory test profiles, including renal profile (RP), RP with liver function tests (LFT), RP with LFT and Calcium/Phosphate, etc., thus making it only possible to request UA as a single, individualised test. To assess the efficacy of the intervention, we compared the total number of UA requests and the resulting economic savings for pre- (September till November 2022) and post- (December

2022 till February 2023) intervention three-month periods. Additionally, the prescription rates of Allopurinol before and after intervention were also analysed. **Results: In the post-intervention period, t**here was a 97% decrease in the total number of UA requests (684 requests) compared to the pre-intervention interval (21,961 requests). Economically, the strategy generated RM14,893.90 in savings for laboratory expenditure. The number of patients prescribed Allopurinol decreased by 42% from 207 patients (pre-intervention) to 120 patients (post-intervention). **Discussion:** This simple strategy resulted in a remarkable reduction in UA requests, as well as a significant drop in Allopurinol prescriptions. Our findings suggest that patients with hyperuricemia may have been unnecessarily treated in the absence of clinical symptoms. In conclusion, our study highlights the need for improved education on the appropriate use of biochemical testing, which could potentially lead to further cost savings and more efficient laboratory operations.

Abstract no 37

Evaluation on NOVA Typhoid IgM/IgG combo rapid test and ECOTEST Typhoid IgM/IgG rapid test for rapid detection of Typhoid fever

Siti Norsuhada Mua'ainue Deen, Suhana Hashim, Mohd Sanusi Che Lah, Norasmaliza Abd Ghafar, Nur Ain Mohd Khair, Raazmeezaliza Razali , Mazlita Mohd Zain, Mohd Ikhwan Che Kar , Nur Umairah Mohammad Usolli, Noor Hafizan Salleh
Kota Bharu Public Health Laboratory, Kota Bharu Kelantan

Introduction: Typhoid fever is an endemic in many countries including Malaysia. The causative agent of Typhoid fever is *Salmonella enterica* serovar Typhi. Reliable and rapid diagnosis is needed for confirmation of suspected cases. Two rapid serological test kits (NOVA Typhoid IgM/IgG and ECOTEST Typhoid IgM/IgG) were evaluated during typhoid outbreak in prison in Kelantan. Methodology: A cross sectional study was conducted during the outbreak in prison at Kelantan. Blood was collected from patients with clinical signs and symptoms of Typhoid fever during the outbreak from August till October 2022 in prison at Kelantan. The standard culture method was used to diagnose Typhoid fever. Two rapid serological test kits (Novatest Typhoid IgM/IgG & Ecotest Typhoid IgM/IgG) were used for culture positive of *Salmonella enterica* serovar Typhi. The diagnostic accuracy of the two kits were evaluated using the culture method as the gold standard. Results: From all the cases diagnosed by blood culture (n=25), we enrolled with two kits (NOVA Typhoid IgM/IgG and ECOTEST Typhoid IgM/IgG Rapid Test). With the culture method as a reference standard, we found that NOVA Typhoid IgM/IgG Rapid Test was 72% sensitive and 100% specific, with 100 positive predictive values and 78% negative predictive values whereas ECOTEST Typhoid IgM/IgG Rapid Test was 40% sensitive and 100% specific, with 100 positive predictive values and 62.5% negative predictive values. Conclusion: The result showed that NOVA Typhoid IgM/IgG and ECOTEST Typhoid IgM/IgG Rapid Test were useful tools for rapid diagnosis of *Salmonella enterica* serovar Typhi infection during Typhoid fever outbreak in prison.

Abstract no 38

Clinical audit on urgent chemical pathology test requests during water supply crisis in Manjung district

M. Adib, Ling JC, Khadijah Noh
Department of Pathology, Hospital Seri Manjung, Seri Manjung, Perak.

Introduction: Urgent test is defined as the test of which the result is required for immediate clinical decision and patient management. It is an important component in acute critical care setting. In addition, it is also a part of contingency plan during the crisis. This principle applied when Manjung District were facing water disruption crisis that affect water-based chemical analyser until it had stopped functioning and all urgent chemical pathology (CP) samples were referred to Hospital Angkatan Tentera Lumut (HATL) in early April 2023. Methodology: The aim of this study is to determine the knowledge and appropriateness of urgent CP test requests during crisis among clinicians in Hospital Seri Manjung (HSM) and to affect change in request practice. A retrospective audit of CP test requests that were referred to HATL during the crisis were analysed. The requests were analysed using 'List of Urgent Tests' from HSM Pathology Services Handbook 2022, National Minimum Retesting Intervals in Pathology by The Royal College of Pathologists 2021 and patient's medical records for diagnosis and justification of requests. Interventions were done during the second water supply crisis where all requests were screened. Results: There were total of 70 requests with 433 analytes requested during the period of crisis. Only 16 request forms (23%) were written diagnosis or history and 51 requests (73%) were justified. There were about 50% of patients only required analyte monitoring but requested as panel testing. There was also miscommunication where requestors ordered routine panel testing instead of urgent tests due to messages were not relayed to the supervisory staffs. Conclusion: These results demonstrate the knowledge and appropriateness requests for urgent tests during the crisis is fair among clinicians in HSM. Urgent test requests should be accompanied by diagnosis and justification of requests and selective analyte rather than test-panel ordering.

Abstract no 39

Human Leptospirosis: Serovar diversity pattern of pathogenic Leptospira circulating in Kelantan and Terengganu states

Suhana Hashim, Aliyaisma Ariffin, Muhammad Mawardi Jaafar, Zubaidah Yusoff, Siti Norsuhada Mua'ainue Deen, Noor Hafizan Salleh
Kota Bharu Public Health Laboratory, Kota Bharu Kelantan

Introduction: Leptospirosis is an infectious zoonotic disease caused by Leptospira spp. Leptospira genus, further divided into serovars, which were clustered into serogroups, according to their antigenic relations. A single serovar might be found in several species. Microscopic agglutination test (MAT) is one of the gold standard confirmation test and the only tool available to identify the possible serogroups/serovars that caused the disease. Methodology: A descriptive study was conducted from the analysis of one year data from March 2022 to March 2023 mainly to verify the serovar pattern of pathogenic leptospira circulating in Kelantan and Terengganu States. Serum samples from suspected cases of Leptospirosis will be screened

using Lepto Rapid IgM or ELISA IgM. Those with positive or inconclusive results will be tested against twenty serovars of Leptospira by MAT. Results: A total of 1575 samples were tested by MAT with the positive rate of 31.6%. 53% and 15.4% of samples gave equivocal and negative results respectively. Majority of samples were from Kelantan (82.9%) and male (66.4%) were predominant compared to female (33.6%). Among 497 positive samples, 474 were labelled as the first sample with the remaining were regarded as the second sample. Fever durations were in between one to twenty-one days with mode of one day and median of 4.39 days. One positive sample can react with more than one serovar. Thus, the five most prevalent serovars were Patoc(253), followed by Pamona(238), Bataviae(219), Hardjobovis(111) and Lai(97). Among 20 serovars used, the least serovars identified were Canicola(9), Icterohaemorrhage(9) and Javanica(7). Conclusion: Limitation in detecting all available Leptospira serovars make the diagnosis becomes more difficult and challenging. Thus, it is crucial to decide the relevant serovars according to research findings and local data that we have.

Abstract no 40

Laboratory experienced dealing with human malaria cluster among foreign worker in Gua Musang

Suhana Hashim[1], Isameyah Dasuki[1], Muhsin Abdullah[1], Mohd Romdhan Zakaria[1], Hazmanera Mat Zin[1], Nur Shahirah Syazwanie Mohd Saidi[1], Yuzi Sham Yusuf[1], Mohd Sanusi Che Lah[1], Siti Norsuhada Mua'ainue Deen[1], Noor Hafizan Salleh[1], Noorfariza Nordin[2].

[1]Kota Bharu Public Health Laboratory, Kota Bharu Kelantan; [2]Gua Musang District Health Office, Kelantan State Health Department

Introduction: Malaysia 2021-2025 is in the era for prevention of malaria re-establishment. Surge of imported human malaria cases was identified since the reopening of Malaysia's International borders on 1st of April 2022. A human malaria cluster was declared by Gua Musang District Health Office in June 2022 involving foreigners in a palm-oil plantation. This study aims to share laboratory experience in rechecking Blood Film Malaria Parasite (BFMP) slides and processing PCR samples from the human malaria cluster. Methodology: A retrospective record review was conducted in April 2023 at Kota Bharu Public Health Laboratory (KBPHL). All samples from the human malaria cluster in Gua Musang were reviewed. The index case was confirmed to be positive for *P. falciparum* and a Mass Blood Survey with BFMP and/or PCR were carried out among all contacts. Results: A total of 343 BFMP slides were taken and diagnosed by Gua Musang's vector laboratory staff. There were 69 negative and 8 positive BFMP slides sent to KBPHL for confirmation. One case was noted to have species discrepancy from *P. vivax* to *P. malariae* while the rest showed concordance results. The discrepancy could be due to very low-density count and only a few early trophozoites seen in the slide. Thirty-six (36) EDTA samples for PCR among asymptomatic level-1 contact were also received and eight (8) samples verified as submicroscopic malaria (22.2% positivity rate). In this cluster, most of plasmodium species identified were *P. vivax,* 9 (52.9%) followed by *P. falciparum* 5 (29.4%), *P. malariae* 2 (11.8%) and 1 (5.9%) mixed *P. vivax* and *P. falciparum* infection. Conclusion: The implementation of effective prevention and control measures had successfully controlled the cluster. Besides microscopy, PCR has become a valuable test in detecting submicroscopic infection. Thus, support from all respective authorities from both government and private sector are essential to prevent malaria re-establishment.

Abstract no 41

Acute flaccid paralysis and enteroviral infections: Is it connected?

Fatin Amirah Suib, Kamal Haikal Mat Rabi, Banusha Vanukuppal, Wan Nabilatul Huda Wan Ghazali, Mohd Samsul Samsuddin, Victoria Jicob, Nadzirah Nazri, Alia Nabila Abdul Halim, Nur Amiera Husna Shamsul Anuar, Rozainanee Mohd Zain

Virology Unit, Infectious Disease Research Centre, Institute for Medical Research (IMR), National Institute of Health Complex (NIH).

Introduction: Acute flaccid paralysis (AFP) is an uncommon but severe neurological illness which is normally due to inflammation of the spinal cord, also identified as acute flaccid myelitis (AFM) primarily affecting paediatrics ages. There is an increasing cases of confirmed AFM cases in the recent years, and it has been seen to be associated with non-polio enterovirus (EV) infection. This type of myelitis is a condition of paralysis due to lesions in the anterior horn of the spinal cord. The clinical presentation is often profound muscle weakness, which mimics other acute neurological illnesses. AFM has been said to be related to different viral agents, however recent outbreaks show a connection with Enterovirus D68 (EV-D68). Methodology: Samples were selected on a suspected AFM case for age less than 15 years old only. A stool collected within 14 days of onset symptoms, with 2 adequate sample to be collected in 24 to 48 hours apart. A real-time reverse transcription polymerase chain reaction (RT-PCR) will then be conducted on the samples by detecting the presence of ribonucleic acid (RNA) of non-polio enteroviruses and their sub-types including Coxsackievirus A6 (CA-6), Coxsackievirus A16 (CA-16), Enterovirus A71 (EV-A71) and EV-D68 in the early clinical course. Results: A total of 176 cases of AFM were suspected in between September 2022 until March 2023. Among these 176 cases, a total of 299 stool samples were sent from all hospital throughout Malaysia. Non-polio enteroviruses were detected in 41 (13.71%) of AFM cases from which samples were tested. However, when tested for their sub-types, none were positive. Gender distribution of positive tested samples are almost equal; female 52.17% and male 47.83%. While distribution of race of positive samples shows majority of Malay 82.61% patients infected, followed by Indian 13.04% and Chinese 4.35%. Conclusion: AFP cases has been reported to be associated with EV-D68 in many other countries, however, surveillance done throughout Malaysia has not shown a possible association. Therefore, this needs to be analysed further to truly establish the correlation to prevent a significant morbidity in paediatrics ages.

Abstract no 42

Giant cell-rich solitary fibrous tumour: A rare variant of solitary fibrous tumour

Mohd Hasli Shafie,Noraini Mohamad
Department of Pathology, Hospital Serdang, Selangor, Malaysia.

Introduction: Solitary fibrous tumour (SFT), a rare tumour of mesenchymal origin, are usually asymptomatic, slow growing tumours, often discovered as an incidental finding on imaging. Giant cell-rich SFT(GCR-SFT) is a rare variant with no prognostic implication. Case report: A gentleman presented with 6-month history of painless right upper eyelid swelling. CT orbit shows a homogenous enhancing soft tissue lesion at the right orbit preseptal tissues superior medial aspect. Excision biopsy reveals a circumscribed, whitish, firm tumour. Microscopically, the tumour is cellular and well-circumscribed, composed of haphazardly arranged spindle-shaped cells with variably collagenous stroma, containing thin-walled large branching, 'staghorn'-shaped vascular channels. Numerous multinucleated giant cells are seen. Mitoses are rare and tumour necrosis is absent. Immunohistochemistry shows STAT6,CD34,EMA,CD-99, BCL-2 positivity and negative for Desmin. Discussion: GCR-SFT is a rare variant of SFT with a predilection for the orbital region. It should be considered as a differential diagnosis of spindle cell lesion with multinucleated giant cells, and STAT6 immunohistochemistry should be performed to distinguish this rare tumour from other mesenchymal neoplasms. A complete surgical resection remains the gold standard of treatment. Conclusion: In summary, clinical, radiological and histopathological examination along with immunohistochemistry are crucial for accurate diagnosis and management.

Abstract no 43

Sweet conundrum in a patient with HbJ-Bangkok: A case report

Izzatul Aliaa Badaruddin, Nurul Zawani Zaini, Amirah Farhanah Amiruddin, Hanita Othman
Department of Pathology, Faculty of Medicine, National University of Malaysia, Jalan Yaakob Latiff, 56000 Cheras, Kuala Lumpur, Malaysia.

Introduction: According to the latest Malaysian Clinical Practise Guidelines on the Management of Type 2 Diabetes Mellitus (T2DM), Haemoglobin A_{1c} (HbA_{1c}) is a diagnostic and monitoring glycaemic marker. Various methods had been studied to measure HbA_{1c}; each carried different analytical strengths and disbenefits. Case Report: A 65-year-old man who underwent a diabetic workout appeared to have discordant HbA_{1c} and fasting blood sugar (FBS) profiles. The FBS ranged between 6.3 – 7.8 mmol/L, while the HbA_{1c} measured on high-performance liquid chromatography (HPLC) ranged between 4.1 – 4.3%. An oral glucose tolerance test (OGTT) resulted in 6.3 mmol/L and 5.9 mmol/L for fasting and two-hour glucose, respectively, consistent with impaired fasting glucose. Oral metformin was initiated, and the patient was monitored using FBS and HbA_{1c}. Subsequently, the HbA_{1c} became unreportable despite the 5.5 – 7.6 mmol/L FBS, leading the Pathologist to suggest haemoglobin analysis. Recent changes in the HbA_{1c} method from HPLC to capillary electrophoresis (CE) resulted in an atypical profile with higher HbA_{1c} values (9.1%/76mmol/mol), strengthening the presence of a haemoglobin variant. The haemoglobin analysis revealed a heterozygous haemoglobin variant possible of haemoglobin J Bangkok (HbJ-Bangkok). Discussion: To date, the haemoglobin variant is one of the intangible factors influencing HbA_{1c} analysis. Migration of HbJ-Bangkok at A_0 in HPLC increased the A_0 concentration, causing HbA_{1c} to be falsely low since A_0 is the denominator in generating derived HbA_{1c} for reporting. In CE, Hb J-Bangkok did not co-elute with HbA_0; the low HbA_0 concentration resulted in falsely high derived HbA1c. Although CE provides better visualisation of haemoglobin fraction migrations, reported HbA1c by any method can only be utilised to monitor glycaemic status, not the diagnosis for Prediabetes or T2DM. The utilisation of HbA_{1c} in the presence of a haemoglobin variant demands Pathologist's acumen through interpretative commenting.

Abstract no 44

Daratumumab interference in laboratory investigations of multiple myeloma.

Amirah Farhanah Amiruddin, Nurul Zawani Zaini, Nabihah Nordin, Izzatul 'Aliaa Badaruddin, Wan Muhammad Azfar Wan Shuaib, Hanita Othman
Department of Pathology (Chemical Pathology), Faculty of Medicine, Universiti Kebangsaan Malaysia, 56000 Kuala Lumpur, Malaysia.

Introduction: The use of "monoclonal antibody (mAb)" therapy in the management of multiple myeloma has grown significantly. This includes Daratumumab, a human anti-CD38 IgG Kappa mAb. Monitoring of monoclonal protein on serum protein electrophoresis is essential in the management of multiple myeloma. Daratumumab is known to appear as a slow gamma band in serum protein electrophoresis and may cause interference and misinterpretation. Case Report: We report a case of a 68-year-old gentleman who presented with relapsed IgG Kappa multiple myeloma. Second-line therapy with Darzalex, Velclade, and Dexamethasone was prescribed. The appearance of a new faint IgG Kappa band in the cathodic end of the gamma region was noted and persisted for at least 6 months after the commencement of Daratumumab therapy. In addition, pre-transfusion testing showed pan-reactive antibody screening which was resolved by antibody screening using dithiothreitol (DTT) treated red blood cells. This case highlights the interference in serum electrophoresis and pretransfusion workup by Daratumumab therapy, where it may mask the complete clearance and interfere with the quantitation of endogenous monoclonal protein. Discussion: Communication between the clinical and laboratory staff on the commencement of monoclonal antibody therapy, as well as awareness of laboratory staff on possible interferences caused by monoclonal antibodies, are essential to avoid misinterpretation which may have serious clinical consequences.

Abstract no 45

A rare case of nocardia kroppenstedtii bacteraemia in advanced left breast invasive carcinoma patient: A case report

Suhaila Md Hanapiah, Putri Izyan Hazwani Megat Khushari, Habibah Haron, Ahmad Nur Ikhwan Muhammad Nur
Department of Pathology, Institut Kanser Negara, Putrajaya, Malaysia

Introduction: Nocardia spp. are gram positive, soil borne aerobic actinomycetes which appear as partial acid-fast, branching filamentous bacillus. It is known as an opportunistic infection in immunocompromised hosts. More than half of Nocardia spp have been reported to cause human infections. Nocardia spp. cause serious pulmonary infections with some case of brain abscesses in immunocompromised patients. Nocardia bacteraemia is extremely rare, with only few cases reported. Case report: Here we reported a case of Nocardia bacteraemia, isolated in a blood culture of a 73-year-old female, with underlying metastatic left breast invasive carcinoma. The patient presented with respiratory symptoms requiring oxygen and regular nebulization. Blood culture grew Nocardia kroppenstedtii, identified using MALDI-TOF MS System, while the antibiotic susceptibility tests were performed using the MIC Test strip. Treatment with Trimethoprim-Sulfamethoxazole and Imipenem was initiated and despite some improvement, the patient requires long-term oxygen therapy (LTOT) at home. Discussion: Nocardia infections need to be identified early and treated with appropriate antibiotics. Although rare, Nocardia bacteraemia is an important diagnosis due to the specific antimicrobial required for treatment with high mortality.

Abstract no 46

Lancefieldella parvula bacterial sepsis in an oncology patient: A case report of Gram positive anaerobic bacteraemia.

Suhaila Md Hanapiah, Chellaiah Archanaa, Hamidah Mohamad, Azilah Abdul Aziz
Department of Pathology, Institut Kanser Negara, Putrajaya, Malaysia

Introduction: This is a report of the rare case of Lancefieldella parvula (formerly *Atopobium parvulum*) bacteraemia in an oncology patient. Commonly isolated from the human oral cavity especially from the dorsum of the tongue and human gingival crevices, also some reported dental implant associated infections, this pathogen has been scarcely found causing bloodstream infections. Case report: This Gram positive anaerobic bacilli was isolated in pure culture in a 50 year old lady with Stage 4 breast cancer who presented with sudden unresponsiveness, dyspnoea and history of cough for 3 days prior seeking medical help. Worsening brain metastasis with infective lung changes were noted upon further examination. Blood culture taken during this ordeal yielded Lancefieldella parvula as identified by MALDI-TOF MS. The isolate was susceptible to all antibiotics and after antibiotic treatment, patient recovered well and discharged home. The successful identification by MALDI – TOF MS, helped this patient have a successful treatment outcome for an uncommon bacteraemia. Discussion: This pathogen may cause endogenous infections when the immune system is compromised or mucosal barriers are damaged, however, there are only a limited number of publications reporting this anaerobic Gram positive isolate causing bacteraemia and mostly identifying the isolate as *A. parvulum*. This case report is likely one of the very few reports on L. parvula isolated in pure culture from blood. Although the potential source for this anaerobic bacteraemic infection is not well known, there have been cases reported in other patients with clinical history of malignancy.

Abstract no 47

Diagnostic Dilemma between Primary or Secondary Adenocarcinoma with Clear Cell Morphology in Rectosigmoid

Siti Shakinah Sobri[1], Farhana Mohamad Mohaidin[2], Khairul Shakir Ab Rahman[2], Mohd Firdaus Ghazali[3]
[1]Department of Pathology, Hospital Sultanah Bahiyah, Alor Setar, Kedah; [2]Department of Pathology, Hospital Tuanku Fauziah, Kangar, Perlis; [3]Department of Surgery, Hospital Tuanku Fauziah, Kangar, Perlis

Introduction: Adenocarcinoma with clear cell morphology in colorectum is a rare finding and raises suspicion of a metastatic disease from a Mullerian-derived organs, and less commonly from breast, pancreaticobiliary tract, stomach, and colon. Heterogeneity in histogenesis and molecular profile result in various histomorphology of colorectal adenocarcinomas. Case report: A 62-year-old lady presented with 3 months history of per rectal bleeding, altered bowel habits and loss of weight. An anterior resection was performed, and specimen examination revealed a fungating tumour measuring 50 mm in maximum dimension with local infiltration into the pericolorectal fat. Microscopy showed malignant epithelial cells in complex back-to-back glands within a desmoplastic stroma. The malignant cells are tall columnar, exhibiting diffuse cytoplasmic clearing, pseudostratified nuclei, markedly pleomorphic nuclei with vesicular chromatin pattern and prominent nucleoli. There was no extracellular mucin, endometriosis or conventional adenoma identified. Margins were clear and all lymph nodes were negative. Immunohistochemistry showed diffuse positivity towards CDX2, CEA, beta catenin, CK19, and patchy SATB2 whilst negative for CK7, CK20, CD10, vimentin, PAX8, SALL4, and AFP. The cytoplasm lacks mucin and glycogen as evident by negative PAS and alcian blue stains. Discussion: Primary clear cell adenocarcinoma of colorectum is rare and literature reported these cases to have adjacent adenoma, supporting the concept of adenoma-carcinoma sequence in colorectal carcinogenesis. The absence of adenomatous lesion in a female gender patient raises the possibility of a metastatic disease especially from female genital tract. Combination of various immunohistochemical panel and histochemical stains are useful to separate between primary and metastatic disease.

Abstract no 48

"Glioblastoma Multiforme with Arteriovascular Malformation Presentation"- A Case Report

Fatin Syahirah Shahiruddin[1], Tay Eng Tan[1], Liang Hooi Lim[2], Umaira Salleh[2]
[1]Histopathology Unit, Pathology Department, Hospital Pulau Pinang; [2]Neurosurgery Department, Hospital Pulau Pinang.

Introduction: Glioblastoma Multiforme (GBM) is an aggressive neoplasm that accounts for up to 20% of primary brain tumour in adults. Diagnosing GBM is challenging and requires multiple workups. Simultaneous manifestation of GBM and arteriovenous malformation (AVM), although uncommon, has been reported. However, a highly vascularised GBM mimicking AVM both radiologically and intra-operatively is a rare occurrence. Case report: A 61-year-old guy presented with progressive left sided hemiparesis associated with seizures and persistent headache. Both CT and MRI brain were suggestive of large right temporoparietal AVM, further confirmed with a cerebral Digital Subtraction Angiography (DSA). Patient opted for surgical intervention over Stereotactic Radiosurgery (SRS) and an elective surgery was planned. However, in view of worsening neurological deficit, a repeat CT brain was done and showed perilesional cerebral oedema. The patient was optimized for craniotomy and excision of AVM. Intra-operatively, a clear demarcation is visualised and complete excision is successful. However, histological examination showed sheets of hypercellular glial tumour with marked nuclear pleomorphism, raised mitotic activity and areas of microvascular proliferation with palisading necrosis observed. Thus, diagnosis of Glioblastoma Multiforme is concluded. Discussion: Differentiating GBM and AVM, or simultaneous presentations of both posed a major challenge when establishing a diagnosis. Imaging studies showing a lesion with prominent or abnormal cerebral vasculature can be a vascular malformation or neoplastic process. These need to be further differentiated from highly vascular glioma or hypervascular glioblastoma. Primary imaging assessment is crucial in establishing preliminary diagnosis but a confirmed biopsy is encouraged, by the fact that both cases are subjected to different treatment modalities.

Abstract no 49

Prevalence of red cell antibodies among Thalassaemia patients: A single hospital study in Pahang

Tan Pei Pei, Suguna Somasundram, Nor Suhaila Md Riffin, Noorulhuda Mohd Mokhtar, Izzatul Izzanis Abd Hamid, Siti Marlina Misran, Nur Ilani Noh
Hematology-Blood Bank Unit, Pathology Department, Hospital Sultan Haji Ahmad Shah, Temerloh

Introduction: Red blood cell (RBC) alloimmunisation is one of the complications seen in transfused thalassaemia patients, especially if non-phenotype-matched RBCs were supplied. According to the Malaysian Thalassaemia Registry 2019, Pahang has 217 thalassemia patients who received transfusions regularly and 215 who did so irregularly. This study discussed the prevalence and types of RBC antibodies among these patients, types of thalassaemia/haemoglobinopathy, and clinical heterogeneity. Methodology: This was a retrospective data review among thalassaemia patients in 2022 who received treatment in our center. Records of the patients were retrieved from the Hospital information system (HIS), Laboratory Information System (LIS), and Blood Bank Information System (BBISv2). The patients with positive antibody screening were traced for the type of thalassaemia/haemoglobinopathy, frequency of transfusion, and type of red cell antibody. Non-Malaysians and those with missing data were excluded. Result: A total of 97 thalassaemia patients received treatment from our centre. 19.6% (n=19) of the thalassaemia patients had positive antibody screening. 15 of them developed clinically significant antibodies, predominantly Rhesus (RH) antibodies, followed by Kidd antibodies. The earliest antibody development was observed at the age of 9; the eldest developed antibodies at 58. Most transfusion-dependent thalassaemia (TDT) cases are Haemoglobin (Hb) E-beta thalassaemia. In contrast, non-transfusion dependent (NTDT) cases are common among Hb H-Constant Spring (CS) (non-deletional) patients. Interestingly, an uncommon coinheritance of non-deletional Hb Adana and Hb CS lead to TDT. Discussion/Conclusion: The age of presentation, frequency of transfusion, and the need for splenectomy vary according to the thalassaemia mutation. RH were the most antibodies detected among the thalassaemia patients. Red cell phenotype should be carried out for all thalasseamia patients, especially before transfusion. Priority of matching red cells should be given to RH and Kidd, as they elicited the most immunogenicity and clinical significance.

Abstract no 50

A case series of a rare variant haemoglobin (Haemoglobin G-Georgia) in Terengganu.

Suguna Somasundram[1], Azly Sumanty Ab Ghani[2], Wan Ahmad Hayati Wan Hassan[2], Norafiza Mohd Yasin[3]
[1]Department of Pathology, Hospital Sultan Haji Ahmad Shah, Temerloh; [2]Department of Pathology, Hospital Sultanah Nur Zahirah, K.Terengganu; [3]Molecular Genetics Laboratory Institute for Medical Research

Introduction: Haemoglobin G-Georgia (Hb G-Georgia) is an alpha globin chain variant haemoglobin with amino acid substitution of proline to leucine at the alpha gene. There is no published literature on this haemoglobin variant in Malaysia to our best knowledge. Case report: Here we report a case series with total of 12 cases of Hb G-Georgia reported in Terengganu from 2017 to 2022. Most of these cases were detected during the Form 4 National Thalassaemia Screening Programme. The capillary electrophoresis (CE) method eluted the Hb G-Georgia in zone 7, meanwhile the variant haemoglobin co-eluted with Hb A when the high-performance liquid chromatography (HPLC) utilised. The agarose gel electrophoresis at alkali pH showed the band of Hb G-Georgia cathodal to the Hb S band. The DNA analysis of alpha globin gene shows heterozygous state of α1 Codon 95 (CCG>CTG) Hb G-Georgia mutation with Sanger sequencing. Two of the cases show coinheritance with ($-\alpha^{3.7}$) deletion and one case shows coinheritance with Hb E trait. Discussion: The Hb G-Georgia is a rare alpha haemoglobin variant. Hb G-Georgia was first reported in the 1970. Hb G-Georgia are observed in multi-ethnic population particularly in African American, Turkish, Portuguese and Thailand population. It is asymptomatic/ benign in nature in heterozygote state and compound heterozygote state with alpha and beta chain variants. This haemoglobin variant has a slight increase in oxygen affinity shifting the oxygen dissociation curve to the left and decrease heme-heme interaction.

Abstract no 51

Placenta with vesicles, decision dilemma

Norhidayah Jalani[1], Sellymiah Adzman[2], Norlisa Khalid[1]
[1]Department of Pathology, Hospital Serdang, Selangor, Malaysia; [2]Department of Pathology, Hospital Kuala Lumpur, Kuala Lumpur, Malaysia.

Introduction: The presence of vesicular lesions in placenta is occasionally encounter during pre-natal or post-natal examination. Accurate diagnosis is crucial given the widely different risks, outcomes and management. In many occasions, patient may need for close post-natal follow-up. We describe two cases of placenta with vesicular lesions. Case report 1: A 36-year-old, gravida 3 para 2 was referred to our centre for placenta with vesicular lesions during her routine pre-natal examination. Her serum β-human chorionic gonadotropin (β-HCG) level was normal for her gestation age. Thus, she was allowed to carry her pregnancy. She underwent emergency lower segment caesarean section at 35 weeks of gestation for reduce foetal movement and delivered a 1.1kg baby. Placenta examination shows a bulky placenta with multiple cystic lesions and subsequently reported as placental mesenchymal dysplasia with foetal vascular malperfusion. Case report 2: A 31 years old, primigravida with underlying gestational hypertension and persistent proteinuria has premature delivery at 25 weeks of gestation. She delivered a 600g baby girl. During placenta examination, multiple vesicles are identified with area of infarction. The placenta shows features suggestive of placental mesenchymal dysplasia with maternal vascular malperfusion. However, her serum β-HCG level is more than 225000 IU/L. Thus, she is treated as partial mole. Discussion and conclusion: Commonest diagnosis for placenta with vesicular lesions is molar pregnancy and usually termination of pregnancy is advised. However, there are other possibility such as placental mesenchymal dysplasia and complete hydatidiform mole with coexistent normal foetus (twin mole). Although these conditions are rare, the pregnancy may be allowed to carry until term especially in precious pregnancy. Hence, complete examination including clinical presentation, amniocentesis for karyotyping, imaging finding, serial serum β-HCG level and histopathological examination are important to determine for further management.

Abstract no 52

Case exemplifying benign transient hyperphosphatasaemia in children

Nurul Adani Binti Annas, Nursyahirah Saleh, Lim Say Min
Hospital Teluk Intan, Perak.

Introduction: Alkaline phosphatase (ALP) may indicate bone or liver diseases. Transient hyperphosphatasaemia (TH) or elevation of Alkaline phosphatase (ALP) is on occasion found in children without evidence of bone or liver disease and self resolves within months. Incidence of TH was approximated 2.4% in children below 5 and 6.2% below 2 years. This should prompt consideration for more judicious investigation with respect to such condition to avoid unnecessary tests in select cases. This case report exemplifies such. Case: 1 year 8 months old girl presented with symptoms of upper respiratory tract infection. There was no significant birth, developmental or past medical history noted. Routine investigation revealed markedly elevated serum ALP, 1989 U/L. Otherwise, there were no clinical evidence suggestive of bone or liver disease. 25-hydroxyvitamin D and intact parathyroid hormone was normal. She was treated appropriately and subsequently discharged. Serial ALP noted sequential decrement from 1718 U/L upon discharge and 503 U/L 2 weeks later. Discussion: Elevated ALP in children is often seen related to bone growth spurt. Characteristic features of TH include age less than 5 years; no clinical and laboratory evidence of bone or liver disease; elevation in both bone and liver ALP isoenzyme; and a return to normal ALP values within 4 months. Viral infections may be associated with the risk of TH by increased synthesis or decreased clearance of ALP which may be the possible cause of TH in this case. There are also association of TH in patients with gastroenteritis, respiratory infection, asthma and failure to thrive. Conclusion: Diagnosis of TH should always be considered in a child with raised ALP after liver and bone disease have been ruled out clinically and through investigation.

Abstract no 53

Calcium, phosphate and parathyroid hormone in predialysis chronic kidney disease patient with periodontitis

Wan Asma' Wan Abdul Azim[1,4], Hanim Afzan Ibrahim[1,2,4], Nur Karyatee Binti Kassim[1,2,4], Haslina Taib[2,4], Nurul Huda Abdullah[3,4]
[1]Department of Chemical Pathology, School of Medical Sciences, Universiti Sains Malaysia; [2]Basic Sciences and Medical Unit, School of Dental Sciences, Universiti Sains Malaysia; [3]Department of Internal Medicine, Universiti Sains Malaysia, Health Campus, Kubang Kerian, Kelantan, Malaysia; [4]Hospital Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia

Introduction: Periodontitis is associated with systemic inflammation which can worsen the condition of renal function and has been identified as a potential modifiable risk factor for chronic kidney disease (CKD). Both conditions can be associated with alterations in calcium, phosphate, and parathyroid hormone metabolism. This study aims to compare the level of intact parathyroid hormone (iPTH), calcium and phosphate in predialysis CKD patients with periodontitis, predialysis CKD patients without periodontitis, periodontitis patients without CKD and in healthy population, and to determine its correlation with plaque and bleeding score in predialysis CKD patients. Methodology: A total of 120 patients with 30 patients from each group were recruited (Group I: Predialysis CKD patient with periodontitis, Group II: Predialysis CKD patient without periodontitis, Group III: periodontitis patient without CKD and Group IV: healthy population). Serum calcium, phosphate and iPTH were analysed and oral examination was conducted to determine plaque and bleeding score. Result: There is significant difference in median iPTH among four groups ($p<0.001$). Post hoc analysis shows there is significant difference between CKD (Group I and II) and non-CKD group (Group III and IV), with CKD having higher iPTH. However, there is no significant difference between group I and group II and between group III and group IV. The mean levels of calcium and phosphate are not significantly different among all group. There is correlation found between iPTH level and bleeding

score (r = 0.3, $p<0.05$) in CKD patients. Conclusion: Higher level of iPTH in CKD patients is not associated with the presence of periodontitis. There is no alteration of serum calcium and phosphate in predialysis CKD patients regardless of its periodontal status. However, correlation between iPTH and bleeding score need further evaluation for its role in predicting the periodontal status in CKD patients.

Abstract no 54

Out of the ordinary: A case study of pulmonary Salmonellosis from an unexpected infection site

Jayamalar Pitchaimuthu[1], Mazwanee Arena Mohamad Raba'ai[1], Eunice Lu SzeQuen[1], Murnihayati Hassan[2]
[1]Microbiology Unit, Pathology Department, Hospital Sibu, Sarawak, Malaysia; [2]Infectious Disease Research Center, Institute for Medical Research (IMR), Shah Alam, Malaysia.

Salmonellosis is a disease caused by *Salmonella* that may present with varying clinical infections. Among those infections, non-typhoidal *Salmonella* strains are uncommonly observed in pleuropulmonary infections and sometimes are overlooked due to their rarity. We present a case of an 86-year-old female with underlying hypertension and hyperthyroidism who experienced sudden chest pain and palpitation, along with chills, fever, and cough, with an unresolving left pleural effusion despite a history of admission a week prior. She was admitted to the ward for thyrotoxicosis associated with atrial fibrillation and heart failure and for further investigation of the underlying infection. On day 2 of admission, the patient became febrile and tachypneic. C-reactive protein (CRP) 192 mg/L and white blood cells (WBC) 13.6 x 10^9/L, predominantly neutrophils, were elevated. Computed tomography of her thorax showed bilateral pleural effusion, and tapping was performed. Bilateral lung pleural fluids were sent for direct culture, and another set was sent in culture bottles. Microscopic examination of the left lung pleural fluid revealed scanty Gram-negative bacilli, but successful growth was detectable after 2 days of incubation in the aerobic blood culture bottle only. The organism was identified as *Salmonella enteritidis*, resistant to ampicillin and sensitive to ceftriaxone, ciprofloxacin, and co-trimoxazole. The antibiotic regimen was changed from piperacillin-tazobactam to ceftriaxone for definitive therapy. Although the patient achieved microbiological clearance, as evident by repeatedly negative pleural fluid cultures and a reducing trend of septic parameters, she eventually succumbed to death 9 days later. In conclusion, awareness of the possibility of *Salmonella* species as a causative agent in pleuropulmonary infection may guide proper management and targeted treatment. Alternative ways to yield organisms from pleural fluid need to be explored.

Abstract no 55

A rare case of Kaposiform Haemangioendothelioma with platelet-trapping syndrome Kasabach-Meritt phenomenon

Noraziah Salehan[1], Mukarramah Che Ayub[1], Suryati Hussin[1], Siah Hui Hui[2], Sellymiah Adzman[2]

Background: Kaposiform Haemangioendothelioma (KHE) is a rare, often deep-seated vascular neoplasm typically occurs during early childhood. Kasabach-Meritt phenomenon (KMP) is rare, but life-threatening complication characterized by thrombocytopenia and consumptive coagulopathy. Method: We report a case of KHE in a 3-month-old, term baby girl, presented with left sided neck swelling, severe thrombocytopenia and consumptive coagulopathy. The lesion started at day 40 of life and progressively increasing in size for about 2 months. The swelling became discoloured from blackish to purplish. Full blood count and full blood picture showed thrombocytopenia. D-Dimer was high and Fibrinogen level was low. MRI base of skull and neck showed locally invasive vascular tumour. Result: A diagnosis of KHE was confirmed by histopathology examination (HPE) and supported by clinical presentation and radioimaging. HPE showed vague coalescing nodules of spindled endothelial cells forming elongated slit-like lumina containing red blood cells. Microthrombi are noted in the lumen and extravasated red blood cells are present. The endothelial cells are positive for CD34, CD31, ERG and Podoplanin. GLUT-1 is negative. Patient was given Prednisolone 3mg/kg and followed by Sirolimus 0.2mg OD. Conclusion: KHE is a rare vascular tumour which shows aggressive local growth but rarely metastases. KMP rarely causes death due to mass effect or metastasis, but the presence of KMP is associated with significant mortality. Complete surgical removal with wide margins is the most common treatment modality. Combination of corticosteroid and Vincristine is administered for unresectable tumour.

Abstract no 56

Evaluation of Elecsys© PIVKA-II levels among hepatocellular carcinoma and chronic liver disease patients in Hospital Universiti Sains Malaysia (USM)

Mohamad Noor, Rabiatul Adawiyyah[1]; Kassim, Nur Karyatee[1,3,4]; Omar, Julia[1,4]; Mohammed Jelani, Aniza[1,4]; Lee, Yong Yeh[2,4]; W Ahmad, Wan Muhamad Amir[3,4].
[1]Department of Chemical Pathology, School of Medical Sciences, Universiti Sains Malaysia; [2]Department of Medicine, School of Medical Sciences, Universiti Sains Malaysia; [3]Basic and Medical Science Unit, School of Dental Sciences, School of Medical Sciences, Universiti Sains Malaysia Health Campus, Kota Bharu Kelantan, Malaysia; [4]Hospital Universiti Sains Malaysia, Kubang Kerian, Kelantan, Malaysia

Introduction: Hepatocellular carcinoma (HCC) is associated with poor prognosis. Prothrombin induced by vitamin K absence-II (PIVKA-II) is an emerging biomarker in the diagnosis (HCC) as evidenced by several studies. However, the data still varies by ethnicity and geographical location. Objective: This study aimed to determine the levels of serum PIVKA-II among hepatocellular carcinoma, chronic liver disease (CLD), and healthy subjects in our population setting in Hospital USM. Methodology: A one-year cross-sectional study was conducted in Hospital USM, Kelantan from January to December 2022. A total of 87 subjects were recruited for this study and divided into three groups: HCC (n=29), CLD (n=29), and healthy controls (n=29) groups. The demographic data of the subjects were documented, and a venous blood sample was obtained. Serum Elecsys© PIVKA-II was analysed by the chemiluminescent immunoassay method using Cobas e immunoassay analyser. The levels of Elecsys© PIVKA-II in the three groups of subjects were compared using statistical

analysis Kruskal-Wallis test and the Mann-Whitney test for post hoc analysis. Results: The mean age of HCC, CLD, and healthy subjects was 61, 58, and 46 years old respectively. There was a statistically significant difference in Elecsys© PIVKA-II levels among different groups of subjects, $X^2(2) = 36.6$, $p<0.001$, with median (IQR) concentration of Elecsys© PIVKA-II in HCC, CLD, and healthy subjects, being 878.8 (11666.4), 21.1(33.6) and 19.1(2.6) ng/ml respectively. Post hoc analysis revealed statistically significant differences between HCC and CLD groups ($p=0.003$), as well as HCC and healthy subjects ($p=0.003$). However, there was no significant difference between CLD and healthy subjects ($p=0.84$). Conclusion: Biochemically, the Elecsys© PIVKA-II levels can distinguish between HCC, CLD patients, and healthy subjects. It has added value in diagnosing HCC as a complement to radiological imaging modalities.

Abstract no 57

HbA1c request among paediatric patients in Hospital Universiti Sains Malaysia – A two years review

Nurlina Mohd Lasim[1,3], Noorazliyana Shafii[1,3], Noor Azlin Azraini Che Soh[1,3], Tuan Salwani Tuan Ismail[1,3], Aniza Mohammed Jelani[1,3], Wan Nor Fazila Hafizan Wan Nik[1,3], Hanim Afzan Ibrahim[1,2], Ibrahim Ismail[1,3]

[1]Chemical Pathology Department, School of Medical Sciences, Universiti Sains Malaysia; [2]School of Dental Sciences, Universiti Sains Malaysia, Health Campus, Kelantan, Malaysia. [3]Hospital Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia.

Introduction: Diabetes mellitus (DM) is estimated about 0.4/1000 of children globally, with type 1 diabetes mellitus (T1DM) being more common (>80%). Haemoglobin A1c (HbA1c) is used to monitor glycaemic control in DM paediatric patients. However, studies showed HbA1c doesn't effectively represent blood glucose levels in T1DM paediatric patients. This study aims to determine the percentage and indications of HbA1c request among paediatric patients in Hospital Universiti Sains Malaysia (HUSM). Methodology: A cross sectional study using retrospective data of HbA1c request of paediatric patients below 18 years old from Endocrinology Laboratory, in 2020 and 2021. The patients' diagnosis was retrieved from HUSM Discharge Summary System. Data were analysed using SPSS Software and Microsoft Excel. Result: A total of 286 (0.7%) and 300 (1.4%) of HbA1c were requested in 2020 and 2021 respectively. Most of the requests were diabetic-related diseases which accounts for 90.2% (n=258) in 2020 and 86.7% (n=260) in 2021. The commonest indications were DM (70.2% in 2020, 65.4% in 2021), followed by obesity (20.9% in 2020, 25.0% in 2021), and maturity onset diabetes of the young (3.1% in 2020, 3.8% in 2021). The non-diabetic related diseases accounts for 9.8% (n=28) in 2020 and 13.3% (n=40) in 2021. Thalassemia (17.9% and 15.0%) was the most common indication followed by short stature (10.7% and 10.0%), and hypopituitarism (10.7% and 15.0%) in 2020 and 2021 respectively. Discussion/Conclusion: HbA1c request among paediatric patients in HUSM is still low. However, the request is increasing. The type of DM could not be elicited as most of the diagnoses were only stated as DM. Some of the requests were not indicated. HbA1c in T1DM paediatric patients showed significant variability of blood glucose level, which could be due to extensive β-cell destruction that leads to rapid and complete depletion of endogenous insulin and glucagon secretion dysregulation.

Abstract no 58

A retrospective study of extended spectrum Beta Lactamase (ESBL)-producing *Enterobacterales* in Hospital Melaka from November 2022 to January 2023

Rafika Zainal Zahari, Nur Humairah @ Padmaloseni, Nor Ashiken Bt Abd Ghafar, Nur Hamizah Md Yunos, Marliza Kamarolzaman

Microbiology Unit, Pathology Department, Hospital Melaka

Introduction: Extended-spectrum Beta Lactamases are enzymes that confer resistance to most beta-lactam antibiotics. Infections with ESBL-producing *Enterobacterales* remain a significant health burden and require prompt detection to initiate appropriate treatment. This study aims to evaluate the performance of screening (presence of augmentation) and phenotypic confirmatory test for ESBL. Methodology: This cross-sectional study was conducted on 96 specimens sent during this period to Pathology Laboratory Hospital Melaka. These specimens were subjected to an ESBL screening test and a subsequent phenotypic confirmatory test as recommended by the Clinical and Laboratory Standards Institute (CLSI). Results: Among these isolates, *Escherichia coli* constitutes 58% (n=56/96), *Klebsiella pneumoniae* 40% (n=38/96), and *Proteus mirabilis* 2% (2/96). ESBL producers were 89% (n=85/96) whereas Multidrug resistant (MDR) organisms were 11% (n=11/96). Our study shows that the highest prevalence of ESBL-producers was from urine specimen which was 60% (n=58/96) followed by sputum specimens, 8% (n=8/96). This study shows that the sensitivity and specificity of the screening test (presence of augmentation) is 100% as a confirmation of ESBL-producer among screened isolates. Discussion: Screening tests conducted to detect ESBL-producers as indicated by presence of augmentation shows excellent performance to confirm presence of ESBL-producers. Furthermore, it is not time consuming and provides early detection and thus allows for timely patient management. Conclusion: Screening test is a reliable and adequate tool for early detection of ESBL- producers. Prompt ESBL detection will assist early judicial antibiotic administration and swift adherence to infection control practices for preventing the spread of these infections.

Abstract no 59

A hope in Terengganu, Malaysia.

Nurul Farhani Abu Bakar, Nor Ainiza Mansor
Haematology Unit, Department of Pathology, Hospital Sultanah Nur Zahirah, Kuala Terengganu, Terengganu.

Introduction: Haemoglobin (Hb) Hope is a rare variant of beta-globin chain resulting from point mutation [beta136Gly→Asp(GGT→GAT)], which are unstable and have decreased oxygen affinity. It has been documented in several ethnic backgrounds. To the best of our knowledge, this is the first reported case in Malaysia. Case report: A 27-year-old pregnant lady came for antenatal booking with Hb 10.1g/dL. At 27th weeks of pregnancy, Hb drop to 8.4 g/dL with MCV 82.9fL, MCH 27.6pg, RBC 3.04 10^6uL and RDW-CV 12.3%. Full blood picture (FBP) showed normochromic normocytic red cells with occasional elliptocytes. Iron status was normal. She is clinically asymptomatic with no known family history of thalassaemia. Hb analysis was requested. On capillary electrophoresis (CE) a peak at zone 10 (42.7%), Hb A 52.9% and Hb A2 3.7% observed. High performance liquid chromatography (HPLC) revealed abnormal peak at P2 window (43.8%), Hb A 47.8%, Hb A2 3.0% and Hb F <1%. Deoxyribonucleic acid (DNA) analysis of beta-globin gene identified heterozygous state of Hb Hope. No abnormality detected for alpha-globin gene. Discussion: Hb Hope is clinically silent with normal haematological parameters, can be missed during thalassaemia screening. It's interaction with other globin chains cause variation in the clinical severity and haematological parameters. Moderate anaemia with normal MCV and MCH in this patient is questioned, requires exclusion of alpha-thalassaemia by thorough DNA analysis. Limited information regarding Hb Hope in pregnancy and its impact on Hb level obtained. On immunoturbidometric assay, Hb Hope and HbA1c co-elute, lead to spurious elevation of HbA1c. CE able to separate Hb Hope, the peak found at zone 10 with mild increased in Hb A2. DNA analysis of beta-globin gene provides definitive diagnosis. Family screening is recommended. Conclusion: Understanding this analytically challenging Hb variant, it's interaction with other globin mutation and interference on HbA1c is important. Hb Hope in pregnancy demand further exploration. DNA analysis of beta-globin gene is mandatory for diagnosis.

Abstract no 60

Method comparison study for calcium measurement (oCPC versus Arsenazo) on AU5800 Beckman Coulter analyser in Hospital Selayang

Afiqah Ariffin, Zuhaili Fikri Nordin, Tengku Norita Tengku Yazid, Najwa Hayati Muzaini
Chemical Pathology Unit, Pathology Department, Hospital Selayang, Selangor, Malaysia.

Introduction: Method comparison study is performed to ascertain whether the new method is appropriate to replace the current in-use method and to determine any significant difference in results between both methods. In this study, two methods of calcium measurement were verified comparing the current in-use-oCPC method to the new-Arsenazo method on AU5800 Beckman Coulter analyser. Methodology: This is a prospective cross-sectional study conducted as per Method Verification Guidelines by the Ministry of Health using minimum of 40 patient samples. All samples were analysed over five working days with each sample was analysed in duplicate within two-hours using both methods. All data were recorded and calculated using Microsoft Excel. Outliers within the method and between methods were checked and evaluated. Ranges of data were considered adequate as $r \geq 0.975$ or equivalent $r^2 \geq 0.95$. The linear regression was estimated by determining the Y=bX+a. Bias were calculated at medical decision limits and Total Error (TE) between two methods were evaluated and compared with total allowable error (Tea). The new method is acceptable and suitable to replace the current in-use method if the calculated Total Error (Tec) was less than the Tea. Results: 40 patient's samples were analysed and the ranges of data were adequate as $r = 0.9751$ or equivalent $r^2 = 0.95$. Calculated bias (0.23 & 0.07) and calculated TE (2.79 & 2.63) for new-Arsenazo method have met with the Quality Specification for minimum of Bias (1.70) and minimum of Tea (4.51) from Biological Variation. Discussion/Conclusion: This study showed calcium measurement of new-Arsenazo method versus the current in-use-oCPC method on AU5800 Beckman Coulter analyser in Makmal Patologi Kimia, Hospital Selayang has no significant difference and thus, the new method is fit for purpose and acceptable to be used.

Abstract no 61

A case report of Alpha thalassaemia intermedia due to compound heterozygosity for Hb Adana (HBA2:c.179G>A) with other non-deletional alpha thalassaemia in a Malay family : Urge for molecular detection

Nor Azah Farhah Ab Aziz[1], Nurfathni Mohd Arifin[1]
[1]Pathology Department of Tanah Merah Hospital Kelantan, Malaysia; [2]Hematology Unit of Pathology department of Hospital Raja Perempuan Zainab II, Kelantan, Malaysia

Background: Haemoglobin Adana [HBA2: c179G4A (or HBA1); p.Gly60Asp] is a non-deletional alpha chain mutation. It is due to mutation at codon 59 of the a2- or a1-globin gene resulting in a glycine to aspartic acid substitution. Thus, resulted a highly unstable Hb alpha variant. Hb Adana is particularly rare and to date, it is mostly described in coinheritance to other a-thalassaemia mutations. Such interactions result in various phenotypes depending on the underlying genotype. Since routine haematological tests do not detect the a fore mentioned unstable variant, it is quite likely a diagnosis to be missed or delayed, with any complications this may have for a patient. Description of the case: A case report of mutation identification in a 7-year-old girl of Malay origin is described. The importance of conducting not only molecular studies to confirm common mutations, such as the –a3.7 kb deletion, but also DNA studies in patients whose phenotype and results of standard tests are not consistent or who present with moderate clinical features is highlighted. Conclusion: The awareness of the necessity for accurate diagnosis is raised, especially in populations that thalassaemia win and is attributed to various numerous mutations.

Abstract no 62

Can we improve thyroid fine-needle aspiration cytology adequacy?

Farhana Mohammad Mohaidin[1], Khairul Shakir Ab Rahman[1], Wan Irnawati Wan Ab Rahman[2], Mathaneswaran a/l Rajaswaran[1], Mohd Firdaus Ghazali[3]

[1]Department of Pathology, Hospital Tuanku Fauziah; [2]Department of Radiology, Hospital Tuanku Fauziah; [3]Department of Surgery, Hospital Tuanku Fauziah, Kangar, Perlis

Introduction: Fine needle aspiration (FNA) has played a crucial role in managing thyroid nodules owing to its safety and accuracy. It was apparent that in Hospital Tuanku Fauziah (HTF), the thyroid FNA adequacy rates are low leading to increased patient financial cost, anxiety, and delays in diagnosis and treatment. Thus, a consensus interdepartmental interventional plan had been developed that consisted of standardization in thyroid ultrasound (US) reporting using American Thyroid Association (ATA) guidelines, a structured privileging and training program for aspirators, the utilisation of ultrasound guided FNA, rapid on-site evaluation (ROSE) and continuous education and monitoring with the direct involvement of the pathologists. Method: A cross-sectional interventional study comparing the result of thyroid FNA adequacy before; phase 1 (P1) (January 2015 - August 2016) and after the interventional plan was done; phase 2 (P2) (August 2017 - March 2018). Result: A total of 188 cases were involved in P1 and 50 cases in P2. The majority of cases in P2 were done under US guidance (82%) compared to in P1 study (12.65%). Almost all thyroid US reporting used the ATA guideline in P2 study (98%). All the aspirators in P2 are privileged to perform FNA compared to which P1 only 22.2%. The adequacy rate was significantly increased from 59.57% to 94% after the interventional plan. Discussion and conclusion: The utilisation of US guided thyroid FNA, adherence to standardised reporting guidelines, competent FNA aspirators and proper ROSE had a significant effect on the adequacy rate of thyroid FNA. We hope this developed interventional plan can be adopted by other hospitals in Malaysia for a better thyroid FNA outcome.

Abstract no 63

The alarming threat of *Aeromonas* species Bacteraemia: An experience by a specialist hospital of southern region in Malaysia

Hafzan Baharim[1], Nur Hazirah Mohd Azlan[1], Mohd Helmi Ujir[1], Murnihayati Hassan[2]

[1]Microbiology Unit, Department of Pathology, Hospital Pakar Sultanah Fatimah, Johor; [2]Bacteriology Unit, Infectious Disease Research Center, Institute of Medical Research, Malaysia.

Introduction: *Aeromonas* species is a gram-negative organism that commonly found in freshwater, estuarine and marine environment. This intestinal pathogen has been increasingly reported causing wound infections and bacteraemia. Knowing the high mortality rate of *Aeromonas* bacteraemia (28-63%), this study was conducted to determine the epidemiology and susceptibility pattern of *Aeromonas* species. *Methodology:* We conducted a retrospective study by reviewing the Laboratory Information System (LIS) of Microbiology Unit, Hospital Pakar Sultanah Fatimah, Johor for the period of January 2019 to December 2021. Identification was achieved by VITEK® 2 System Software 8.0. Epidemiological data of patients with *Aeromonas spp* isolated from the blood were studied. Results: A total of 14 patients with *Aeromonas spp* bacteraemia were identified during the period of the study. Both gender (50%) was equally affected, while the median age of the patients was ± 44.8. *Aeromonas hydrophila* was the most common species identified (57%) followed by *Aeromonas sobria* (28.6%) and *Aeromonas salmonicida* (7.1%). Most isolates (92.9%) showed susceptible to ciprofloxacin and trimethoprim-sulfamethoxazole. 21% of total isolates demonstrated resistance and 7.1% showed intermediate susceptibility towards ceftriaxone. Discussion/ Conclusion: This study showed *Aeromonas* species is a potential pathogen causing bacteraemia in our centre. We found the occurrences was equally distributed in both gender and more commonly affected the middle age group. Given the mainstay of treatment *Aeromonas* bacteraemia is ceftriaxone, it is an alarming as increasing resistant pattern towards ceftriaxone has been seen in our centre. A multi-centre study on risk factors associated and treatment outcomes may benefit in the future.

Abstract no 64

Lupus anticoagulant-hypoprothrombinaemia syndromes (LAHPS): A rare entity caused bleeding in Systemic Lupus Erythematosus (SLE) patient

Nurul Atiqah Abdul Ghani[1], Abdul Kadir Mat[1], Faridah Hanim Zan[1], Sanada Abu Bakar[1], Lai Ee Ling[2], Tan Jenq Tzong[2], Faridah Md Afandi[3], Mohd Fikri Mustapa[3], Nurimatussolehah Sarijan[3], Suzana Zainol[3].

[1]Pathology Department Hospital Taiping, Perak, [2]Medical Department Hospital Taiping, Perak, [3]Pathology Department Hospital Tunku Azizah, Kuala Lumpur

Introduction: SLE is a complex multisystem autoimmune disease due to deposition of circulating antibodies and immune complexes that can affect any organ, resulting in variable clinical manifestations. Bleeding is an uncommon presentation and if it does happen, it is due to severe thrombocytopenia, severe uraemia and rarely lupus anticoagulant-hypoprothrombinaemia syndromes (LAHPS). Here we report a young adult male with SLE, who presented with bleeding and later was diagnosed with LAHPS. Case report: A 17-year-old male diagnosed with SLE with haematology and musculoskeletal involvement. He was serologically positive for anti-nuclear antibody (ANA) and anti-double stranded DNA. Subsequently, he presented with intermittent fever and gum bleeding. FBC showed Hb 9.2g/dL, Platelet 52x10^9/L, TWC 2.7x10^9/L. Coagulation screening showed persistently deranged results (PT= 40 sec/ aPTT= 126 sec). On mixing studies, aPTT showed uncorrected results, whereas PT was fully corrected. Subsequent investigations showed triple positivity of antiphospholipid antibodies. Coagulation factor activity assays revealed reduced level of FII (prothrombin) at 9.6 % with normal level of FX, FV and FVII. FVIII and FIX activity were reduced at 24% and 26% respectively. Findings support diagnosis of LAHPS. He was successfully treated with Hydroxychloroquine, Intravenous Hydrocortisone & Vitamin K. On subsequent follow-up, FII activity assay normalised to 104.2%. Discussion: LAHPS is a rare disorder characterised by association of Acquired Factor II Deficiency and Lupus Anticoagulant (LA). High index of suspicion is crucial for early diagnosis, to avoid fatal complications.

Abstract no 65

Recurrent diffuse-type tenosynovial giant cell tumour of the ear: A diagnostic and therapeutic challenge

Wei Meng Phang[1], Natasha Ayla Ahmad Zulkiflee[2], Noorjehan Omar[1]
[1]*Department of Pathology and* [2]Department of Otorhinolaryngology*, Hospital Serdang, Selangor, Malaysia*

Introduction: Pigmented villonodular synovitis (PVNS) is a rare neoplastic process that affects the joint synovium, tendon sheath, and bursa. Clinical symptoms vary depending on location; surgical synovectomy is the standard treatment. However, relapse rates vary. *Case report:* We present a case of recurrent PVNS in a 57-year-old gentleman who presented with right ear pain, preauricular swelling, reduced hearing, and tinnitus. Imaging revealed a lobulated soft tissue lesion with extension to the external auditory canal and adjacent bone erosion. The patient underwent a second surgery due to a recurrence within 11 months. Histopathological examination confirmed a recurrent giant cell tumour, probably arising from the zygoma. H3.3 G34W negativity ruled out the possibility of conventional giant cell tumours of the bone, while the morphology was not compatible for cartilaginous lesions and osteoid-forming tumours. Latest follow-up, the patient was noted to have residual soft tissue lesions with temporal bone erosion and suspicious dural involvement. *Discussion:* PVNS can involve the synovium diffusely or focally or occur extra-articularly near a bursa or tendon sheath. Advances have led to the development of targeted agents inhibiting the CSF1R pathway, but a patient-specific approach is needed. This case underscores the clinical and histopathological complexities in diagnosing and treating PVNS. It highlights the necessity for a comprehensive interdisciplinary approach for patient care, including detailed radiological assessment and contemplation of innovative therapeutic interventions.

Abstract no 67

Spindle cell rhabdomyosarcoma in an adult female: A rare entity

Wei Meng Phang[1], Noraini Mohd Dusa [2], Fong Juen Kiew[1], Noorjehan Omar[1]
[1]*Department of Pathology, Hospital Serdang, Selangor, Malaysia;* [2]*Department of Pathology, Hospital Kuala Lumpur, Kuala Lumpur, Malaysia*

Introduction: Spindle cell rhabdomyosarcoma (RMS) is a rare RMS subtype that affects children and young adults with varying clinical behaviours and genetic alterations. It is associated with a worse prognosis in adults. We present a case of spindle cell RMS in a 57-year-old woman. Case report: Our patient presented with odynophagia, a muffled voice, and a foreign body sensation for a month. Intraoperatively, a fungating, friable mass was seen at the right base of the tongue. Microscopically it showed hypercellular spindle-shaped tumour cells arranged in compact fascicles with scanty stroma, invading the submucosal stroma. The tumour cells are positive for SMA, Desmin, MYOD1 and Myogenin. These findings were consistent with spindle cell rhabdomyosarcoma. Discussion: Spindle cell RMS in adults is associated with a recurrent MYOD1 mutation in 41% of cases, indicating a potential mechanism in the oncogenesis of skeletal muscle. Sclerosing RMS may be closely related to spindle cell RMS; however, unifying genetic abnormalities must be identified. Additional genetic studies are necessary to enhance the diagnosis, prognosis and treatment options of spindle cell RMS. This case highlights the importance of considering spindle cell RMS in the differential diagnosis of a spindle cell neoplasm.

Abstract no 68

Interlaboratory comparison of blood gas point-of-care devices in Hospital Tunku Azizah: A greenhorn approach for device proficiency

Nur Aishah Sharudin, Asmaliza Ab Manan, Hafizah Abdullah
Chemical Pathology Unit, Hospital Tunku Azizah, Jalan Raja Muda Abdul Aziz, Kampung Baru, 50300 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur, Malaysia

Introduction: Blood gas Point-of-Care (POC) device has significantly improved therapeutic turnaround time (TTT), particularly in critical departments such as emergency and intensive care units. Central and satellite laboratories are known to have a shorter TTT, with improved prompted treatment given to patients up to 38% of the time. Consequently, the laboratory is crucial in ensuring the proficiency of blood gas analyser that produces reliable result for the patients. Methodology: Ten ABL800 Basic blood gas analysers, eight located in the POC sites and two located in a central laboratory were chosen for the proficiency test. Each site received two samples, one at a low and one at a high level, and were evaluated between March 14 and March 24, 2023. Electrolytes; calcium, sodium, and potassium were chosen for the comparison along with oximetry measurements. The mean and standard deviation (SD) from all sites were obtained for Z-score calculation, with a score less than 2 indicating a satisfactory performance. Results: The POC results were comparable to those from the central laboratory, with satisfactory performances for all parameters at all locations with Z-scores of less than 2. Discussion: Although there are numerous advantages to adopting POCT devices in terms of convenience, these benefits are only valid if the data provided are both accurate and dependable. The primary role of quality assurance is to ensure reliability and accuracy. External quality assessment (EQA) is strongly advised for all point-of-care devices and is included in ISO 22870, which is intended to be used in conjunction with ISO 15189 requirements. Participation in EQA scheme, nonetheless, provides more than just a solution for proficiency assessment. Conclusion: Interlaboratory comparison is the simplest proficiency testing necessary for accreditation that can be done in a practical and cost-effective manner. It is useful in centres where there is limited budgetary allocation provided.