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The Annual Scientific Meeting of College of Pathologists, Academy of Medicine of Malaysia: Opportunities and Challenges in Laboratory Medicine, was held at Riverside Majestic Hotel, Kuching, Sarawak on 27-28 June 2019. Abstracts of K. Prathap Memorial Lecture, plenary, symposium and paper (poster) presented are as follows:

K Prathap Memorial Lecture:
Opportunities and challenges for laboratory professional in patient safety

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Pathology has been the engine of healthcare system in understanding diseases and in the last few decades in monitoring therapy. However, the approach and technique we use remain very much the same. As we move into the future of the digital age and artificial intelligence, the challenge is should we continue doing the same or do we need to change and reinvent the discipline and the service we provide. To remain relevant, we have to embrace the change and move with the times. The digitization of pathology laboratories makes the specialty more efficient, specimen more reproducible and the work of pathologists less cumbersome. New technologies that produce biomedical "big data" (next generation sequencing, multiparameter / multiplex flow cytometry, high-throughput proteomics and metabolomics, systems biology analysis) have also caused us to rethink the best approach to diagnostics. While these opportunities and challenges seem daunting, we still have to grapple with old challenges of funding and leadership.

Plenary 1:
Challenges in diagnosis of monoclonal gammopathy

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The monoclonal gammopathies (MG) are a group of disorders characterised by the proliferation of clonal plasma cells to produce resulting in a detectable abnormality called monoclonal component or M-protein or paraprotein. Direct measurement of the M-protein spike by electrophoresis and immunochemical measurements of specific isotypes or free light chains pairs has provided useful information about the quantity of M-protein. Nonetheless, quantitation of M-protein by electrophoretic method gives suboptimal measurements on small M-proteins. In addition, measurements by electrophoresis of M-proteins migrating in the β- and α-regions are difficult due to the presence of normal serum proteins in those regions. The nephelometric quantitation of immunoglobulins (Igs) is a simple automated method that uses anti-human Ig antigen binding fragments (Fabs) that target the constant region of Ig. The method measures both monoclonal and polyclonal immunoglobulins, and therefore, its diagnostic use for identification of monoclonal proteins is not recommended and is also of no value for biclonal and triclonal gammopathies. Use of the serum free light chain (FLC) immunoassay, has led to improvements in the diagnosis and monitoring of patients with plasma cell dyscrasia and other monoclonal gammopathies. Not all MG secrete excess FLC. Abnormal serum FLC ratios have only been detected in 90–95% of intact Ig multiple myeloma and 40% of MGUS. Since these two patient groups can be easily diagnosed by serum M-proteins by protein electrophoresis, a combination of tests is needed to detect all MGs. Nephelometric methods using antisera specific for Ig heavy and light chain epitopes separately quantitate IgG kappa and IgG lambda, IgA kappa and IgA lambda, and IgM kappa and IgM lambda and may be useful for monitoring monoclonal proteins migrating in the beta fraction. The heavy-light, isotype-specific kappa to lambda ratio has been proposed as a potential monitoring method for IgA or IgM M-proteins migrating in the beta fraction. Although the assay is not sensitive enough to use as a routine screening method for MM, a 97% sensitivity observed in IgA MM and IgA MGUS indicates that almost all IgA MM patients can be monitored by HLC for both detection of the disease clone and quantitation using the IgA HLC assay. A 24-hour urine collection allows the quantitation of both the albumin and M-protein that has been rapidly cleared by the kidneys. The potential broad use of mass spectrometry for MG has been recently demonstrated by the application of matrix assisted laser desorption ionization – time of flight instruments (MALDI-TOF) for detecting monoclonal proteins. The Mayo Clinic group performed a large retrospective study in which patients with an assortment of plasma cell proliferative diseases had SPE, IFE, and FLC as well as urine protein electrophoresis and IFE performed at the time of diagnosis. The study shows patients would have had M-proteins detected by the various tests singly or in combination and if urine assays are removed from the diagnostic panel, there is no decrease in sensitivity. This and other studies have led the IMWG to recommend a panel of serum protein electrophoresis, immunofixation electrophoresis and FLC to screen for a MG; the inclusion of diagnostic urine testing is only recommended if amyloidosis is suspected, which simplifies collection for the patient and workflow for the laboratory and reduces costs as well.

woke up; noted baby had changes as mention before. Otherwise, baby was healthy, no history of fever, flu, cough, vomiting, passing loose stool, fitting and others that suggest any illness. Baby was able to feed normally and active as usual. There was no history of suggesting other family members had suffered from active tuberculosis. Postmortem findings showed lividity more on posterior and right side of face and shoulder. No external injury. Internally, both lungs revealed hemorrhagic, liver showed hepatomegaly and other organs were grossly normal. Microscopically revealed proteinaceous or pink material in alveoli and bronchiole with presence of hemosiderin but Perl's iron stain was negative. There is no sign of inflammation nor granuloma in both lungs. H&E stain of liver section showed there is a granuloma in a liver. *Discussion:* In a child with a normal immune system a granulomatous skin reaction develops only at the site of BCG vaccination. If an individual has an underlying immunodeficiency this can lead to dissemination of the bacteria followed by widespread granulomatous inflammation. Cause of hepatic granuloma such as Tuberculosis, Visceral larva migrans, Hepatitis C, Primary biliary cirrhosis, autoimmune hepatitis, drug-induced, neoplasm and disseminated BCGitis. Disseminated BCG infection has an incidence of 1-20 per 10 million doses of vaccine, with a mortality of 50-80%. Tuberculosis could not be the definite cause of death as no suggestive finding during postmortem and microscopic examination. Ziehl-Neelsen stain showed negative for mycobacterium. Finding of hepatic granuloma was incidental. This infant had history of injection of BCG vaccination during birth and hepatitis B, two weeks before for the second dose injection. Therefore, hepatic granuloma that we found was most probably due to BCG vaccination after excluding all other possible cause. *Learning Points:* The cause of asymptomatic granuloma in this case was not identified, but BCG vaccination was considered the most likely.

GP-85. A comparison of whole slide imaging (WSI) viewers

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Introduction: Pathologists diagnose disease and guide therapeutic decision making through accurate interpretation of microscopic images on glass slides. With the advancement of technology, whole slide imaging (WSI) allows pathologists to view glass slides on computer monitor like navigating Google Maps. WSI consists of two processes. The first process is acquiring high quality images as tiled or stripes using high-resolution camera, combined with one or more high-quality microscope objectives, from glass slides. These individual images were then combined to produce a single whole slide image. The second process is viewing or analysing the scanned images using specialised software, *i.e.* virtual slide viewer. *Materials & Methods:* We have evaluated several WSI viewers based on the following features: Documentation, Data management, Usability, Visualisation, Flexibility and Segmentation. We also performed a case study using the various viewers. These viewers were downloaded from the website of the respective provider. *Results & Discussion:* Viewers evaluated included *CaseViewer, QuPath, Pathomation, ImageScope, Image J, Zen Blue* and *NIS-element*. We found that *CaseViewer* and *QuPath* are superior among the evaluated viewers for the prescribed features. However, certain software programs which are equipped with built-in function such as cell counts and interface with other programme languages such Matlab and Phyton could be the choice for the intended purpose. *Conclusions:* Hence, we would recommend the CaseViewer or QuPath for essential viewing of whole slide imaging.

GP-86. Association of body mass index, waist circumference and prevalence of proteinuria among the university students

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Introduction: An increasing prevalence of obesity regardless of age is endemic throughout the world. Obesity is associated with several chronic conditions including chronic kidney disease (CKD). However, the association of body mass index (BMI) and waist circumference (WC) with proteinuria has not been studied well. A study was conducted to determine the prevalence of underweight, overweight and obesity among the students from nursing programme, Faculty of Medicine and Health Sciences (Universiti Malaysia Sarawak); and to determine the association between BMI and WC with the prevalence of proteinuria. *Materials & Methods:* A cross-sectional study was held from August 2016 to May 2017 among 163 students using a pre-tested questionnaire and measured their BMI and WC. Participants were also tested for proteinuria by dipstick urinalysis. Participants with proteinuria were referred to the primary health care for further investigation. *Results & Discussion:* The study population included 23 males (14.1%) and 140 females (85.9%), age 19 to 28 years. Among male students, the prevalence of underweight, normal weight, overweight and obesity was 13.0%, 65.3%, 13.0% and 8.7% respectively whereas in female students, the prevalence was 17.2%, 62.1%, 11.4% and 9.3% respectively. Overall, 21.0% were high BMI (overweight/obese) (21.7% of males and 20.7% of females) in our study. The prevalence of normal WC and high WC among males was 73.9% and 26.1% respectively whereas in females, the prevalence was 70.7% and 29.3% respectively. Proteinuria was detected in 5 students (3.6%). Among these students, 3 were underweight and 2 had CKD stage II (eGFR: 60-89 mL/min/1.73m^2). Prevalence of proteinuria was statistically significant in the underweight female group (p<0.05). *Conclusions:* The prevalence of proteinuria was significantly associated with underweight female students and the participants from the present study were found to be more obese than Malaysian national standard and university students in Malaysia.