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# A Case of Catastrophic Bleeding in a Patient with Group a Beta-Hemolytic Streptococcal Bacteremia: Atypical Site for Mycotic Aneurysm and Acquired Dysfibrinogenemia

SIM CHUN YANG<sup>1</sup>, RUSLINDA MUSTAFAR<sup>2</sup>

*<sup>1</sup>Department of Medicine, <sup>2</sup>Nephrology Unit, Department of Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.*

## Case report:

We describe case of a 65-year-old lady who had a recent relapse of presumed IgA nephropathy requiring immunosuppressive medications. Her treatment lead her to develop Group A beta hemolytic streptococcal septicemia. This case was further complicated by life threatening internal bleeding caused by the combination of pseudo aneurysm and persistent coagulopathy. Further investigations suggested that she developed mycotic aneurysms secondary to the septicemia, whilst the coagulopathy was presumed to be a result of acquired dysfibrinogenemia which is postulated to be caused by both liver dysfunction and the presence of autoantibodies inhibiting the normal function of her fibrinogens. A combination of these two conditions occurring in the same setting is rare and not found in any case reports or studies to our knowledge. Our patient developed catastrophic bleeding which necessitated both medical and interventional radiological measures.

## Conclusion:

This case illustrated the challenges in managing a devastating bleed caused by mycotic aneurysms with acquired dysfibrinogenemia secondary to group A beta hemolytic streptococcal infection in an immunosuppressed patient with an underlying presumed IgA nephropathy. Clinical suspicion is fundamental in the diagnosis of mycotic aneurysms. Prompt treatment increases the likelihood of a favorable outcome.

## Bilateral Carotid Cavernous Fistula: A Rare Case Report

LU SING HUI, S. KALA SUMUGAM

*Sarawak General Hospital*

OBJECTIVE: To illustrate a rare case of bilateral carotid cavernous sinus fistula.

### A. CASE REPORT:

A 65-year-old gentleman presented with painless bilateral eye redness for three years, started with right eye then affected left eye, progressive worsening. He also presented with diplopia for four days. On examination, the right eye best corrected visual acuity was 6/12 and left eye was 6/9. Both eyes intraocular pressure was 18. There were prominent corkscrew episcleral vessels on both eyes. Right lateral gaze was restricted. There was no proptosis. Other ocular and fundus findings were unremarkable. A series of blood investigations were done, including full blood count (FBC), erythrocyte sedimentation rate (ESR), renal and liver function test, infective screening for syphilis. Rheumatic factor (RF) was positive 32, however, the anti-nuclear antibody (ANA) was negative. All other blood investigations results were unremarkable. Chest x-ray was normal and mantoux test was 2 mm. He undergone CT brain/orbit and CT angiogram reported bilateral symmetrical carotid cavernous fistula. He was subsequently referred to neurosurgery unit and was planned for digital subtraction angiography (DSA) and endovascular embolization by interventional radiologist.

### B. CONCLUSION

Carotid cavernous fistula usually presents unilaterally. However, as demonstrated in this case, carotid cavernous fistula can uncommonly present bilaterally.

## Are Surgeons Sensitive in Screening Patients for Selective Laryngeal Examination?

SYARIFAH NAFISAH A<sup>1</sup>, MAWADDAH A<sup>1</sup>, ROHAIZAK M<sup>2</sup>,  
SHAHRUN NIZA AS<sup>2</sup>, SANI A<sup>1</sup>, MARINA MB<sup>1</sup>

*<sup>1</sup>Department of Otorhinolaryngology Head and Neck Surgery, <sup>2</sup>Department of Surgery, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.*

### **Introduction:**

Voice changes may occur following thyroid surgery due to laryngeal nerve injuries. Selective Laryngeal Examination (SLE) is proposed as the prevalence of vocal fold palsy (VFP) in asymptomatic patients is low.

### **Objective:**

To measure the sensitivity of surgeons in detecting voice abnormalities requiring laryngeal examination.

### **Methods:**

The subjects were 206 audio files of voices of patients undergoing thyroid, parathyroid surgeries and known VFP cases due to other neck surgeries. Assessments of the voices on audio files were done by 3 endocrine surgeons (A, B and C) with 20, 12 and 4 years of endocrine surgery experience respectively. Surgeons' assessments were compared with laryngoscopy findings and preliminary results were analysed for sensitivity, specificity, positive and negative predictive value. The inter-rater reliability was evaluated using Fleiss kappa.

### **Results:**

Rater A, B and C produced sensitivity of 66%, 80% and 64% with the specificity of 94.2%, 92.9% and 92.9%, respectively. Positive predictive value for rater A, B and C are of 76.2%, 74.5% and 74.4%, respectively. Negative predictive value for the 3 raters are of 89.6%, 93.5% and 88%, respectively. Inter-rater reliability for all three raters is 0.70 which reflects substantial agreement between their assessments.

### **Conclusion:**

The present results showed that the surgeons documented voice assessment per-se is not sensitive in screening patients for SLE. Therefore, patients undergoing thyroid surgery still may need routine pre- and post-operative laryngeal assessment.

# Effects of Preeclampsia and Gestational Diabetes Mellitus during Pregnancy on the Quality of Umbilical Cord Blood Hematopoietic Stem Cell

MOHD RAZIF MI<sup>1</sup>, FAZLINA N<sup>1</sup>, ZALEHA AM<sup>2</sup>, S FADILAH AW<sup>1</sup>

<sup>1</sup>Cell Therapy Centre, <sup>2</sup>Department of Obstetrics and Gynaecology, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.

## Introduction:

The CD34<sup>+</sup> hematopoietic stem cell (HSC) and progenitor cells extracted from umbilical cord blood (UCB) were shown to have much capability to proliferate and have some major advantages for transplantation purposes. However, most studies explored the influence of obstetric factors on the number of cord blood cell collection and only a few looked at the effects on UCB-HSC of common disorders complicating pregnancy.

## Objectives:

The aim of this study is to determine the numbers of CD34<sup>+</sup> cells and total nucleated cell (TNC) in UCB collected from pregnant mothers with GDM and PE, following statistical analysis of both maternal and perinatal factors which affect UCB parameters.

## Methods:

A total of 112 UCB samples (32 PE, 42 GDM and 38 non-diseased subjects) were collected. CD34<sup>+</sup> cell and total nucleated cell (TNC) count were enumerated using Trucount tube-based stem cell enumeration kit on BD FACSCalibur.

## Results:

We observed that TNC and CD34<sup>+</sup> cells were significantly reduced in both PE and GDM groups as compared to the control group. PE group showed significantly lower birth weight and higher blood pressure (BP) which led to a lower UCB volume and CD34<sup>+</sup> count. Also in PE group, gestational age showed a significant correlation with NCC and TNC. Significant correlations were also found between a lower NCC and TNC with lower systolic BP, low placental weight and birth weight in GDM group.

## Conclusions:

PE and GDM affect the quality of UCB HSC. These findings could be important criteria for consideration in UCB banking.

## Rapidly Progressive Glomerulonephritis: A Case of Immunotactoid/ Fibrillary Glomerulonephritis – A Common Presentation of an Uncommon Disease

CHONG GUANG YONG<sup>1</sup>, RUSLINDA MUSTAFAR<sup>2</sup>

*<sup>1</sup>Department of Medicine, <sup>2</sup>Nephrology Unit, Department of Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.*

### Case Report:

A 58-year-old Malay lady with no known comorbidities presented with hypertensive emergency and acute pulmonary edema. Urinalysis showed protein 3+, blood 1+ and urine protein creatinine index of 3.22 g/mmol creatinine. She had acute kidney injury with peak creatinine level of 504  $\mu\text{mol/l}$ , serum albumin 24 g/l and hepatitis screening were negative. A renal biopsy showed changes suggestive of immunotactoid or fibrillary glomerulopathy. All glomeruli were with large acellular eosinophilic nodules of variable sizes mainly within the mesangium and non-congophilic deposits were seen. Immunofluorescence examinations showed negative for IgG, IgA, IgM, C3 and C4. However, electron microscopy examination was not done due to the differential diagnosis of immunotactoid or fibrillary glomerulopathy. She was given pulse steroid and cyclophosphamide therapy but the response was poor. Currently she is on regular hemodialysis.

### Conclusion:

Early diagnosis and treatment with ACE inhibitors/ angiotensin II receptor and immune-suppressants may help to reduce proteinuria and delay the progression of disease but due to the prognosis, the patient will still progress into end stage kidney disease. EM may help to ascertain the exact diagnosis but it will not influence the treatment regime and outcome of both IGP/FGN.

This case illustrated the severe form of IGP/FGN that presented with rapidly progressive glomerulonephritis and now dialysis dependent. Her presentations were commonly seen but her diagnosis is rare.

## **An Unfortunate Incidence of Primary Diffuse Large B-cell Lymphoma of Nasolacrimal Duct in a Previously Cured Breast Carcinoma**

**SYAFEERA NS, LAKSHMAN AJ, MOHAMAD D, SARAIZA AB**

*Department of Otorhinolaryngology, Serdang Hospital*

### **Case report:**

Primary nasolacrimal duct malignant tumours are rare. Lymphoma of nasolacrimal duct is extremely rare. Most of the nasolacrimal duct tumours are epithelial in origin. A 56-year-old lady with chronic right epiphora for 1 year and ipsilateral nasal blockage underwent endoscopic dacryocystorhinostomy and biopsy. Intraoperatively, there was right nasolabial mass with medialization of right inferior turbinate. This is followed by chemotherapy due to the histopathological examination revealed non-Hodgkin lymphoma.

### **Conclusion:**

It is important to consider malignancy in all previously treated cancer patient who presents with epiphora. Patient who previously had cancer are at higher risk of developing a second cancer.

## Predictors of Mortality in Upper Gastrointestinal Bleeding - A Review of 1489 Patients

HENRY TAN CHOR LIP<sup>1,2</sup>, TAN JIH HUEI<sup>1,2</sup>, SAROJAH ARULANANTHAM<sup>3</sup>

<sup>1</sup>Department of Surgery, Hospital Sultanah Aminah, Johor Bahru, Malaysia

<sup>2</sup>Clinical Research Centre, <sup>3</sup>Department of Surgery, Hospital Sultan Ismail, Johor Bahru, Malaysia

### Introduction:

UGIB is a common surgical emergency that has an incidence of 100 per 100,000 populations yearly in the UK.

### Objective:

The objective of this study is to identify risk factors and predictors of mortality in upper gastrointestinal bleeding (UGIB) in our local general surgery endoscopy unit.

### Methods:

This is a retrospective cohort study of all emergency endoscopies performed in Hospital Sultan Ismail over 6 years for indications of UGIB. Risk factors were analyzed with logistic regression. Significant risk factors were further analyzed using multiple logistic regression.

### Results:

A total of 1489 patients with male predominance (965/1489) with the mean age of 57.4 (17.00) were included. There were 151 deaths with an overall mortality rate of 10.1%. Majority of the patients had peptic ulcer disease with/without bleeding (607/1489) and varices (165/1489). The highest presenting symptoms were malaena (711 patients), followed by hematemesis (294 patients) and coffee ground vomitus (206 patients). Endoscopy was performed within 24 hrs of presentation in 71% (1064/1489) and 17.8% (265/1489) were performed after 48 hrs. Significant predictors identified were further analyzed using multiple logistic regression and we identified high risk ulcers of Forest 1A, 1B, 2A, 2B ( $p=0.028$ ), Rockall score of  $\geq 8$  ( $p=0.045$ ) and patients that had delayed OGDS done  $> 48$ hrs ( $p=0.002$ ) with odds ratio of 1.73 (95% CI: 1.06, 2.37), 3.68 (95% CI: 1.03, 13.12) and 2.39 (95% CI: 1.37, 4.14) against death, respectively.

### Conclusion:

High risk ulcer of Forest 1A, 1B, 2A, 2B, Rockall score of  $\geq 8$  and patients that had delayed endoscopy done  $> 48$  hrs are significant risk factors and predictors of UGIB mortality.

# Outcome Comparison of Enteral and Total Parenteral Feeding in Predicting Burns Mortality

HENRY TAN CHOR LIP<sup>1,2</sup>, TAN JIH HUEI<sup>1,2</sup>, MATHEW THOMAS<sup>3</sup>,  
SAROJAH ARULANANTHAM<sup>3</sup>

<sup>1</sup>Department of Surgery, Hospital Sultanah Aminah, Johor Bahru, Malaysia

<sup>2</sup>Clinical Research Centre, <sup>3</sup>Department of Surgery, Hospital Sultan Ismail, Johor Bahru, Malaysia

## Introduction:

Nutrition in severe burn patients is a challenge in a burn intensive care unit (BICU). Due to the nature of burn injury, the catabolic state requires more nutrition to cope with the overwhelming stress response and body losses.

## Objective:

The objective of this study is to identify and compare patients whom were given enteral and parenteral feeding with subsequent outcomes of mortality and survival in our local BICU.

## Methods:

This is a prospective study of all burns patient that were admitted to Hospital Sultan Ismail BICU from January 2010 to December 2015. Admission criteria were according to the 2009 American Burns Association guidelines. Enteral or total parenteral nutrition (TPN) and its duration were recorded. Data was analyzed using univariate logistic regression and significant predictors were further analyzed using multivariate logistic regression. Survival analysis was done using Kaplan-Meier survival curve with log rank test.

## Results:

We included 132 patients with a male: female ratio of 2.8:1. The majority of patients had enteral feeding (107 patients) in comparison to 25 patients whom had TPN. Patients that survived were higher in patients with enteral feeding with 60.8% (65/107 patients). Multiple logistic regression produced an odd's ratio of 8.16 (95% CI: 1.73, 38.50) with  $p=0.008$  favorable to mortality in patients that were given TPN. Survival analysis also showed that TPN ( $p<0.001$ ) is a significant risk factor with poorer survival outcome. There were 48 deaths with an overall mortality rate of 36.4%.

## Conclusion:

Total parenteral feeding is a significant mortality predictor with poorer survival outcome in our center. Loss of absorptive function of the gastrointestinal tract may suggest the severity of burn injury itself due to overwhelming systemic inflammatory response.

# Comparison of Knee Physical Examination and Magnetic Resonance Imaging Findings in Diagnosing Anterior Cruciate Ligament Injuries

SYED J<sup>1</sup>, ZAMZURI MZ<sup>1</sup>, JAMALUDDIN S<sup>1</sup>, RUBEN JK<sup>1</sup>, ZAHIR Z<sup>1</sup>,  
YEE HL<sup>1</sup>, KATRULNADA MS<sup>2</sup>, HUZAIMAH A<sup>2</sup>, NORAZIZAH AR<sup>2</sup>

<sup>1</sup>*Department of Orthopaedic and Traumatology, Hospital Kuala Lipis, Kuala Lipis, Pahang, Malaysia.*

<sup>2</sup>*Department of Radiology, Hospital Sultan Haji Ahmad Shah, Jalan Maran, Temerloh, Malaysia.*

## Introduction:

The anterior cruciate ligament (ACL) is the most common structure injured in knee trauma. It causes significant morbidity, thus comprehensive diagnosis is crucial in the management.

## Objective:

This study was conducted to compare knee physical examination (PE) and magnetic resonance imaging (MRI) findings in diagnosing ACL injuries.

## Methods:

In this prospective study, conducted from January 2015 to December 2016, all patients with knee injuries were selected. Patients with bilateral or recurrent injuries; previous knee surgeries or fractures; knee disease or neurological deficit; or contraindicated for MRI were excluded. All knee injuries were assessed with Lachman and Pivot shift test followed by knee MRI later. Both findings were compared with intraoperative knee arthroscopic findings which was considered the definitive diagnosis.

## Results:

Thirty-four out of 40 patients were selected for this study. 24 (71%) were males and 10 (29%) females. Average patients' age was 27.6 years (range 15-42 years). Sports activities were the commonest cause of injury (20/34=59%). Twenty-seven ACL injuries were diagnosed intraoperatively. PE was 89% sensitive, 42% specific and 79% accurate in diagnosing ACL injuries whilst MRI was 96% sensitive, 29% specific and 82% accurate in diagnosing ACL injuries.

## Conclusion:

MRI is sensitive in diagnosing acute cruciate ligament injuries when physical examination findings are inconclusive.

## A Retrospective Study of Knee Joint Aspiration Culture Results in Non-traumatic Acute Knee Pain and Swelling

SYED J, NUR AFIQAH MN, NORATIQA A, FARIS AR, ROSTAM S, IKHWAN S, RIFA AS

*Department of Orthopaedic and Traumatology, Hospital Tengku Ampuan Rahimah, Jalan Langat, Klang, Selangor*

### **Introduction:**

Acute knee pain and swelling is one of the most common presentation to the emergency department and knee aspiration is required to provide the diagnosis.

### **Objective:**

This study was conducted to investigate the knee aspirate culture results in patients with non-traumatic knee pain.

### **Methods:**

This retrospective study was conducted from May 2016 to May 2017. Patients with non-traumatic acute knee pain and swelling with raised blood inflammatory markers were selected. All knee aspirates were done under sterile technique. Knee aspirate culture results were studied in this study.

### **Results:**

Seventeen out of 23 patients were selected. Fifteen (88%) were males and 2 (12%) were females. Average patients' age was 51.9 years with 10 (58%) of them had diabetes mellitus.

Fourteen (82%) knee aspirate culture had no growth whilst 2 (12%) cultures grew *Staphylococcus Aureus* and 1 (6%) MRSA.

All patients with positive culture results were diabetic. Five patients with negative culture results had antibiotics prior to aspirate and 1 patient with positive results had pre-aspirate antibiotics. Intravenous cloxacillin, cefuroxime, and unasin were equally prescribed to 12 patients whilst 2 patients were given augmentin, 1 vancomycin and 1 was not prescribed any antibiotics.

### **Conclusion:**

*Staphylococcus Aureus* is the most common organism isolated in a non-traumatic acute knee pain and swelling.

# Development and Validation of a Food Frequency Questionnaire for Mercury Intake from Seafood among Malaysian Children

NURUL IZZAH AS<sup>1,2</sup>, ZALEHA MI<sup>1</sup>, NURUL ASHIKIN AS<sup>3</sup>, ROZITA H<sup>1</sup>

<sup>1</sup>*Department of Community Health, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.*

<sup>2</sup>*Environmental and Occupational Health Program, School of Health Sciences, Universiti Sains Malaysia, 16150 Kubang Kerian, Kota Bharu, Kelantan, Malaysia*

<sup>3</sup>*Department of Information and Communication Technology, Politeknik Mersing, 86800 Mersing, Johor, Malaysia*

## Introduction:

Food frequency questionnaire (FFQ) is a practical instrument to measure nutrients intake in food and commonly used to assess the relation between diet and disease.

## Objective:

This study aimed to develop and validate a Food Frequency Questionnaire (FFQ) to assess the level of mercury intake from seafood among Malaysian children.

## Methods:

A total of 61 subjects aged 11 years old were randomly recruited from two primary schools in Negeri Sembilan. They were interviewed to complete the FFQ over one-week period. Three 24-hour dietary recalls (3DR) were collected during the study.

## Results:

Mean mercury intake was  $22.73 \pm 19.87$  µg/day from FFQ and  $21.83 \pm 15.97$  µg/day from 3DR. The Pearson correlation coefficient between FFQ and 3DR was strong,  $r=0.953$  ( $p<0.001$ ). The FFQ-3DR showed an acceptable mean percentage difference, 6.73%. Cross-classification of mercury intake between the two methods showed that 73.6% of subjects were correctly classified into the same quintile, 26.4% into adjacent quintile while none were misclassified. The Bland-Altman plot showed most of the data points laid between the limits of agreement, thus, showing a good agreement between the two dietary methods.

## Conclusion:

This newly developed FFQ is a reliable and valid tool which can be used to estimate mercury intake from seafood in children.

## Development of a STR Multiplex Panel for Chimerism Analysis of Malaysian Population

WUI CC<sup>1</sup>, TZE SK<sup>2</sup>, FADILAH AW<sup>1</sup>, NOOR FARISAH AR<sup>1</sup>, HAFIZA A<sup>1</sup>, RAJA ZAH RATUL AZMA RS<sup>1</sup>, AINOON O<sup>3</sup>, ROSHIDA H<sup>4</sup>, NOOR HAMIDAH H<sup>1</sup>

<sup>1</sup>Department of Pathology, Faculty of Medicine, <sup>2</sup>UKM Medical Molecular Biology Institute (UMBI), Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.

<sup>3</sup>Universiti Sains Islam Malaysia, Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan, Malaysia.

<sup>4</sup>National Blood Centre, Jalan Tun Razak, Titiwangsa, 50400 Kuala Lumpur, Malaysia.

### Introduction:

The PCR-based method for amplification of highly polymorphic short tandem repeat (STR) sequences is a reference tool for chimerism monitoring of hematopoietic stem cell transplantation. Commercial kits loci are designed for global population but are less selective for the Malaysian population.

### Objective:

We aimed to develop an 'in-house' STR multiplex panel for chimerism analysis in Malaysian population.

### Methods:

STR analysis is performed by PCR and capillary electrophoresis. In the study, highly polymorphic STR loci in Asian population were selected to form a new multiplex panel. Specific primers were designed to fit in a five-dye chemistry design. To determine the discrimination power and alleles frequency of each locus for the Malaysian population, STR profile from 253 unrelated individuals were determined using the new multiplex panel. STR electropherograms were analyzed using Genescan 4.0 software. The alleles found were sequenced using the Illumina Miseq Sequencer. An allelic ladder was constructed by pooling all PCR purified alleles.

### Results:

Analysis using the newly constructed 13-plex STR panel had successfully detected 202 unique alleles from 253 individuals. All alleles were sequenced and confirmed using STRBase database. An allelic ladder was developed. The combined power of exclusion for the panel was 0.999999997 while the cumulative power of discrimination for male and female were 0.99999999999999991 and 0.99999999999999998, respectively. The power of exclusion and discrimination are superior to commercial STR kits.

**Conclusion:**

A new highly polymorphic 13-loci STR multiplex assay, with its allelic ladder was developed. This would provide a useful alternative for chimerism analysis in Malaysia.

# Viability Difference between Autism Lymphoblastoid Cell Line and Its Normal Sibling when Treated with Kelulut Honey

HAZIRAH H, NORWAHIDAH AK

*Department of Biochemistry, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.*

## Introduction:

Autism spectrum disorder is characterised by restricted and repetitive behaviours, lasting problems with social communication and interaction. Symptoms become apparent only at the age of 2. Children with autism exhibit evidence of reduced antioxidant properties, lower antioxidant proteins and lipid peroxidation. The presence of redox imbalance and elevated oxidative stress in autism leads to other disorders such as mitochondrial dysfunction. Malaysian kelulut honey has antioxidant properties which has shown to significantly decrease production of ROS and lipid peroxidation due to its phenolic and flavonoid contents.

## Objective:

We compared the cell viability using lymphoblastoid cell line of children with autism (ALCL), and their developmentally normal non-autistic siblings (NALCL).

## Methods:

100  $\mu$ L ( $5 \times 10^5$  per mL) cells; ALCL and NALCL at passage 8-10 were treated with kelulut honey (0-500  $\mu$ g/ml) for 24 hours. Three replicates will be performed. Cell viability was measured using MTS. The products will be determined using spectrophotometer at an absorbance of 490 nm using a microplate reader.

## Results:

The relative percentage cell viability of ALCL stays stagnant until the concentration of kelulut honey reached 400  $\mu$ g/ml. Interestingly, different pattern was observed for NALCL whereby the relative percentage viability increases significantly when treated with kelulut honey as low as 100  $\mu$ g/ml, then started to drop when treated with 350  $\mu$ g/ml kelulut honey.

## Conclusion:

It is suggested that the level of oxidative stress and ROS is elevated in ALCL which requires antioxidants to overcome the amount of ROS while in NALCL, treatment with kelulut honey increases its viability almost instantaneously due to low level of ROS.

## Multi-Locus Variable Number of Tandem Repeats Analysis (MLVA): A Simplified Protocol for *Staphylococcus Aureus* Genotyping

RAJA MOHD FADHIL B RAR, HUI-MIN N, RAHMAN J

UKM Medical Molecular Biology Institute (UMBI), Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.

### Introduction:

*Staphylococcus aureus* (*S. aureus.*) is a nosocomial pathogen easily transmitted via human-to-human contact. Pulsed-field gel electrophoresis (PFGE) typing is commonly used for *S. aureus* molecular epidemiology studies and also for infection transmission tracking during hospital outbreaks. Besides PFGE, gel-based Multiple Locus Variable Number of Tandem Repeats Analysis (MLVA) has been developed as an alternative typing method for *S. aureus*.

### Objective:

To simplify the MLVA protocol, making it an even more robust tool for *S. aureus* typing.

### Methods:

MLVA profiles for 17 MRSA strains isolated from UKM Medical Centre in 2009 were determined using a 5-primer-pair multiplex PCR according to established protocols.

### Results:

After exclusion of primers for the *ssp* and *spa* loci amplification from the standard multiplex PCR mixture, the 3-primer-pair protocol was still able to differentiate the strains according to clusters generated by the 5-primer-pair amplification. Clustering similarity between the standard and simplified protocols was observed in another set of 16 MRSA strains isolated from UKMMC in 2013, and also in a collection of 10 clinical and laboratory mutants obtained from the Japanese Collection of *Staphylococcus* Cultures (JCSC) and the Department of Bacteriology, Juntendo University, Tokyo. Cluster differentiation was found to be easier with the simplified MLVA protocol due to fewer amplification bands.

### Conclusion:

We have simplified the established 5-primer-pair multiplex PCR protocol for MLVA genotyping into a 3-primer-pair protocol, making it even easier and cost effective to be used in the laboratory.

# Evaluation of Wound Healing and Antioxidants Activity of *Labisia pumila* (Kacip Fatimah) in Male Rat Model

SHIHAB UDDIN A, ATIQAHA A, AHMAD NS, ISA NM

*Department of Pharmacology, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.*

## Introduction:

*Labisia pumila* (LP), locally known as Kacip Fatimah is a herbal medicine that has been used traditionally for women's health. It may have potential wound healing effects due to its phytochemical properties.

## Objective:

The purpose of this study is to determine the wound healing effect and antioxidants activity of LP in normal male rat model.

## Methods:

126 normal male rats (Sprague–Dawley, 200-250 gm body weight) were divided randomly into 7 groups: sham-operated (SH), wounds treated with: vehicle dressing (VD), flavine dressing (FD), LP *var pumila* leaves extract (PL), LP *var pumila* roots extract (PR), LP *var alata* leaves extract (AL) and LP *var alata* roots extract (AR). Dressing was changed daily, starting from the wound induction until complete healing. The parameters studied were the percentage of wound contraction, histomorphological study, collagen content and the expression of the fibronectin and fibroblast cell by immunohistochemistry (IHC) staining. In addition, levels of enzymatic antioxidants and malondialdehyde representing lipid peroxidation were measured in wound tissue homogenates.

## Results:

Wounds dressed with extracts showed considerable healing and significantly healed faster compared to all control groups. The healing rate of treated groups (PL, PR, AL and AR) ( $p < 0.05$ ) was significantly higher than control groups (SH, VD and FD). Besides, histological analysis revealed remarkable reduction in the scar width and correlated with the re-epithelialization, enhanced collagen content and fibroblast cells, accompanied by a reduction of inflammatory cells in the granulation tissues. LP administration caused a significant higher enzymatic antioxidant activities and a decline in lipid peroxidation.

## Conclusion:

LP may promote wound healing in rat model.

## Manipulation of Gut Microbiota in *In Vitro* Model of Colorectal Cancer: Positive Effects of *Lactobacillus Rhamnosus* against *Fusobacterium nucleatum*

WEIJIAN TAN<sup>1</sup>, NORFILZA MOHD MOKHTAR<sup>1</sup>, RAJA AFFENDI RAJA ALI<sup>2</sup>, KONKEN WONG<sup>3</sup>

<sup>1</sup>Department of Physiology, <sup>2</sup>Gastroenterology and Hepatology Unit, <sup>3</sup>Department of Microbiology, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.

Intestinal microbiota is a diverse community that plays a major role in modulating host metabolism and immunity. In a healthy person, the balance of beneficial and harmful bacteria is maintained. However, when dysbiosis of the gut microbiota occur, it may contribute to diseases such as colorectal cancer. *Fusobacterium nucleatum* is an anaerobic oral commensal and a periodontal pathogen associated with a wide spectrum of human diseases. There is accumulating evidences suggests that adherence of *Fusobacterium nucleatum* to host intestinal epithelial is associated with colorectal cancer. The aim of the present study was to determine the role of a probiotic strain in competing with a selected colorectal cancer pathogen. Thus, *lactobacillus rhamnosus* was investigated *in vitro* to examine its ability to protect, displace and compete with *fusobacterium nucleatum*. In this study, SW480 cell line was used as a host cell and *staphylococcus aureus* was used as a positive control. Three different types of assays (protection assay, displacement assay and competitive assay) were performed in a six-well plate. Cell survival assay was also performed after each assay to determine the survival rate of host cell. The ability of *lactobacillus rhamnosus* to protect, displace and compete was measured by adhesion value of *lactobacillus* strain to each SW480 cell. *Lactobacillus rhamnosus* showed the highest adhesion value in protection assay, followed by competitive assay and displacement assay. In all the assays, the survival rate of SW480 cell was the lowest in the well containing SW480 cell, *lactobacillus rhamnosus* and *fusobacterium nucleatum*. This finding may suggest that *lactobacillus rhamnosus* released some type of defensive chemicals to kill the cancer cells in response with pathogens. Further study will be performed to confirm this finding.

## ***Chlorella Vulgaris* Supplementation Improves Muscle Function of Young Sprague Dawley Rats**

NURHAZIRAH ZA, YASMIN ANUM MY, EKRAM A, SUZANA M

*Department of Biochemistry, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.*

### **Introduction:**

*Chlorella vulgaris* is microscopic unicellular freshwater green algae which has been known for its high nutritive contents with promising reports of its pharmacological effects.

### **Objective:**

The effects of *C. vulgaris* in promoting muscle regeneration and improving muscle strength and functions of young Sprague Dawley (SD) rats were determined.

### **Methods:**

Thirty SD rats were divided into three groups; Group 1 – control (distilled water), Group 2 – treated with 150 mg/kg body weight (BW) of *C. vulgaris*, and Group 3 – treated with 300 mg/kg BW of *C. vulgaris*. *C. vulgaris* was given by oral gavages for three months. At day 30, 60 and 90, parameters measured were open field test (HVS image), grip strength (BIO-GS3, BIOSEB) and bone density (DEXA).

### **Results:**

Body weight was significantly increased as early as week 2 for Group 2 and week 3 for Group 1 and Group 3. Bone mineral content and density were significantly increased in all groups of rats on day 60 and day 90 as compared to day 30 of respective group. The grip strength of front and hind paws of *C. vulgaris*-treated rats was significantly increased on day 30, day 60 and day 90 as compared to untreated control ( $p < 0.05$ ). For both untreated and *C. vulgaris*-treated groups, the grip strength of front and hind paws was significantly increased as the number of day increases. For open field test, the total path was significantly increased for rats treated with 300 mg/kg BW of *C. vulgaris* at both day 30 and day 60. A similar increase in total path was observed in rats treated with 150 mg/kg BW of *C. vulgaris* at day 60 of experiment. No significant difference was observed in total path on day 90 for all groups of rats. The percentage of time moving however was only significantly increased for *C. vulgaris*-treated rats at day 30.

### **Conclusion:**

*C. vulgaris* promotes muscle regeneration of rats as indicated by improved muscle strength and functions.

## The Effects of *Cosmos Caudatus* (Ulam Raja) on the Expression of Detoxifying Enzymes and Antioxidant Genes in Mice Liver

MOHD MUSTAZIL MN, TAN CP, NUR FATIHAH HMR, NUR IZZATI Z, NURDAYANA MS, AHMAD HILMI Y, HARIZZ MISZARD R, KAMSAH J, KAMISAH Y, QODRIYAH HMS, NUR AZLINA MF, AZMAN A

*Department of Pharmacology, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.*

### Introduction:

*Cosmos caudatus* (Ulam Raja) is an appetizer (ulam) eaten with rice and consumed mainly by the Malay community in Malaysia. Previous studies indicated that *Cosmos caudatus* possess strong antioxidant and free radical scavenging activities, and it might have potential tumour-inhibitory effect.

### Objective:

The aim of this study is to investigate the effects of *Cosmos caudatus* aqueous extract (UR) on the expressions of phase II detoxifying enzymes and antioxidant proteins genes in mice liver.

### Methods:

ICR white mice were treated for 21 days with different doses of UR (100, 500, 1000 mg/kg) through oral gavages. Control mice were only given distilled water. After 21 days, the mice were sacrificed and their livers harvested. Total RNA was extracted, reverse transcribed and subjected to qPCR to detect phase II detoxifying enzymes and antioxidant proteins genes expression.

### Results:

Administration of 100 mg/kg UR significantly increased *nqo1* expression in mice liver. Administration of 100 and 500 mg/kg UR significantly increased *gsta1* expression in mice liver. Administration of 100 and 1000 mg/kg UR significantly decreased *hmox1* liver expression, whereas mice given 500 mg/kg UR had similar expression with controls. Administration of 500 and 1000 mg/kg UR significantly increased *gstm3* liver expression, whereas *gstp* and *gstm1* liver expression was significantly decreased at similar doses. Administration of all doses of UR significantly decreased the expression of *gsta3*, *sod3* and *gclc* in mice liver.

### Conclusion:

UR administration mostly resulted in downregulation of phase II detoxifying enzymes and antioxidant proteins genes in mice liver.