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KNOWLEDGE AND PERCEPTIONS OF MEDICINES USE AMONG THE GENERAL PUBLIC: A PILOT STUDY

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Medicine is an essential need for many people to treat their illness. Creating awareness among general public regarding medicines use and common illnesses can promote healthy lifestyles among them. The objectives of this study are to determine public knowledge and perception of medicines use and; to explore the pattern of medicines used in the past 3 months. A cross-sectional survey was carried out among the general public in Pulau Pinang. People who were using medications during the time of the survey or in the last 3 months were invited to participate in the study. Only Malaysians ≥ 18 years were selected by convenient sampling to participate in the survey. The results of this study showed that most of the respondents were using some sort of medications during the last 3 months. Around 30% did not read the label of the medicines before use. Furthermore, participants had low awareness towards some aspects of medicines use such as the name of generic and brand medicines, overuse of paracetamol or vitamins and their side effects, discontinuation of antibiotics, storing ointments and syrups in refrigerator, and the side effects of medicines registered in Malaysia. Efforts are still needed to increase the awareness of medicines use among the general public. More quantitative studies are needed to understand the factors that may influence public knowledge and perceptions on the use of medicines.

Keywords: Knowledge, Medicines use, Perceptions, Public

FACTOR ASSOCIATED WITH SUCCESSFUL QUITTING SMOKING: A RETROSPECTIVE ASSESSMENT OF INTEGRATED QUIT SMOKING SERVICE (IQSS) IN PRIMARY HEALTHCARE SETTING

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This study aimed to evaluate a 2-years integrated quit smoking service in one of the primary health care centre in Sabah. This was a cross-sectional study by reviewing patients' case note in our quit smoking service from Aug 2010 to Aug 2012. This study sought to evaluate whether integrated quit smoking service are beneficial as primary health care smoking cessation module, to assess the CO-validated 6 months Success Quit Rate and to identify factor associate with successful quitting. Of 176 clients enrolled in Luyang Health Clinic Quit Smoking Service (QSS) for the year of 2010 to 2012, almost half (42.6%) succeed to quit at the 6-month follow up. Majority of registered smokers in Luyang Clinic QSS were male and Bumiputera Sabah, being the highest ethnic group registered in the clinic. They were mostly married and employed. In average, registered clients were those aged more than 40 years and most of them had concurrent chronic diseases. Vast

number of clients start smoking in their teens, had smoked for more than 20 years and try quitting at least once before enrollment in our quit smoking service. The mean length of follow up in the study population is 20 weeks with an average number of 6 follow up visits. Of 176 clients, 145 were using nicotine replacement therapy (NRT) and 31 were using varenicline (a nicotinic receptors agonist). Individuals who had higher frequency of follow up visits and longer duration of follow up had higher probability to successfully quit with combined medical and behavioural therapy. On top of that, lower daily number of cigarettes smoked as well as lower FTND score also contributed to higher chance of being total abstinence after 6 month of smoking cessation program in our centre.

Keywords: Quit smoking, Smoking cessation, Smoker, Cigarettes, Fagerstrom, Nicotine

AN ASSESSMENT OF OSTEOPOROSIS KNOWLEDGE AMONG WARFARIN USER SUBJECTS

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Knowledge of osteoporosis plays an important role in developing attitudes towards the disease which in turn impacts health care behaviours. This includes knowledge on physical activity, adequate calcium intake, and adequate vitamin D intake. The objective of our study was to determine osteoporosis knowledge score and osteoporosis knowledge test (OKT) among controls and patients and to determine risk factors affecting OKT. The OKT-M (Malay version) is a 24-item tool with multiple-choice questions assessing knowledge of osteoporosis. The instrument has two subscales: OKT Calcium scale and OKT Exercise scale. The main tools used to assess the osteoporosis knowledge were questionnaires comprised of two sections, first Background questionnaire (about participants) and second OKT. The OKT-M was a reliable and valid questionnaire of 140 controls and 130 patients. Only 15.8% of study population were found to have high OKT-M. There was a significant relationship between OKT-M levels and race, monthly income, family history of osteoporosis, family history of fracture, employment status, warfarin using ($p < 0.005$). In addition, a significant difference (non-parametric statistical test) in OKT-M score was found between race, monthly income, family history of osteoporosis, family history fracture, alcohol habit, employment status, living place, warfarin using $p < 0.05$. Patients in our study had more knowledge than controls (odds ratio [OR] = 4.1, 95% CI: 1.90–8.69). Patients taking warfarin have access to a sufficient degree of awareness by the pharmacist supervisor of the treatment exchange according to patients INR ratio. Therefore, they have more osteoporosis knowledge than those who do not take warfarin (controls).

Keywords: Knowledge, Warfarin, Risk factor, Osteoporosis

A BASELINE PHYSICAL ACTIVITY ASSESSMENT AMONG UITM PHARMACY STUDENTS USING IPAQ SCORING METHOD

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A cross-sectional study was conducted among 70 pharmacy students in UiTM campus Puncak Alam to assess the physical activity level at baseline using IPAQ scoring method. All individuals were investigated by interviews, and all the variables were measured concurrently. Participants were consisting of 35 students categorised as 'lean' (BMI of $>18.9 \text{ kg/m}^2$ to 22.9 kg/m^2) and 35 students categorised as obese (BMI of more than 27.5 kg/m^2). Results indicated that the lean students have a better activity levels compared to the obese ($p < 0.05$). The level of the physical activity was calculated and categorised as low, moderate or high level by applying the formulas and guidelines provided in the protocol. In addition, sedentary obese students had higher waist circumference, waist-to-hip ratios with more depressive symptoms. Further studies involving larger sample size are suggested to be done to fully understand the underlying mechanism for the differences and similarities of findings in different race and population.

Keywords: BMI, Physical activity, IPAQ score, Pharmacy

DIABETIC SELF CARE IN DUHOK, KURDISTAN REGION-IRAQ

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Self-care among diabetic patients is very important to prevent complications; it includes monitoring their blood glucose levels, foot care, taking medications, smoking cessation and regular exercises. The purpose of the current study is to evaluate diabetic self-care and to determine the factors affecting on diabetic self-care among patients in Duhok-Iraq. The cross sectional prospective study was done to evaluate diabetic self-care among type II diabetic patients. Ninety seven patients were randomly selected from diabetic centre. Patients who consented were assessed with translated and validated questionnaire (Kurdish version) regarding diabetic self-care. Additionally, demographic and diabetes-specific characteristics were obtained from the patient's medical record. The average age of the patients was 52.73 ± 8.5 years, and the average BMI of patients was 29.37 ± 5.4 . The percentage of non-educated patients (68.3%) was the highest. Most of diabetic patients followed specific diet for 4 to 5 days per week, while most of the diabetic patients did not measure their glucose levels at home during a week. Female patients measured their glucose level at home more than male patients. Patients who were uneducated smoked 2 cigarettes per week, while the retired diabetic patients smoked about 20 cigarettes per

week. The significant differences ($p < 0.05$) in blood sugar testing and smoking activities were found among different groups. Diabetic patients are in need of many education programs to improve their knowledge regarding self-care. Validated and translated questionnaire can be used in other studies among Kurdish patients.

Keywords: Diabetic, Self-care, Complication, Duhok, Iraq

ASSESSMENT OF PRESCRIPTIONS IN PRIVATE CLINICS IN DUHOK CITY

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Prescription writing is a science and an art, as it conveys the message from the prescriber to the dispenser. The aim of study is screening of the prescriptions written by physicians in Duhok. This study was carried out in private outpatient clinics (four medical centers) in Duhok city. A cross sectional study was carried out from October 1, 2013 through April 30, 2014. Using convenience sampling method, 516 prescriptions were collected from the selected health facilities and examined. Comparisons were made between the health facilities. The prescriber name was present on 100% of the prescriptions and the prescriber address was present on 100% of the prescriptions but only 61.63% contained the registration numbers. The name of the patient was present on 96.32% of the prescriptions, whereas the patient's age and sex were mentioned in only 46.90% and 5.43% of the prescriptions, respectively. The date of the prescription was provided on 89.73% of the prescriptions. The generic drug name was present only in 18.25% the trade name in 40.74% and commercial name in 38.69% of the prescriptions. In 4.91% of prescriptions the drug name was written in wrong spelling and in 4.25% the drug name cannot be read, while 48.06% of prescriptions contain the company advertisements. It was concluded that the majority of prescriptions in Duhok city were not ideal, the majority of doctors write incomplete prescriptions and many drugs are given to patients wrongly. Some doctors make their benefits from pharmaceutical companies superior to the patients care. Many workshops in prescription writing are required for physicians and pharmacists in Duhok.

Keywords: Prescription, Errors, Community, Duhok, Kurdistan-Iraq

INCIDENCE AND RISK FACTORS OF OPIOID ADVERSE EFFECTS AMONG PATIENTS UNDERGOING CAESAREAN SECTION

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Pruritus, nausea and vomiting during caesarean section are very common and unpleasant events. They cause significant distress to the patient and also interfere with surgical procedures. A retrospective study was conducted for 400 patients to determine the incidence of pruritus, nausea and vomiting and identify the risk factors associated with these adverse effects following caesarean section procedure during 18-month periods from January 2013 to June 2014 at Hospital Pulau Pinang (HPP), Pulau Pinang, Malaysia. Assessment of side effects and its risk factors were manually extracted from patient's medical records during the first 48 hour following the caesarean section. Results indicated that 15.6% of patients (n = 62) complained of different medical and therapeutic complications. Pruritus was present in 10.5% (n = 42), nausea and vomiting in 4.3% (n = 17), urinary retention in 0.5 % (n = 2) and hypotension in 0.3% (n = 1) of patients. Multiple logistic-regression analysis identified that: emotional status (anxious) (odds ratio [OR], 6.714; 95% confidence interval [CI95], 1.42–12.61; $p = 0.01$); caesarean indication (poor progress) (OR, 5.41; CI95, 1.33–24.65; $p = 0.019$); blood group (AB) (OR, 6.73; CI95, 1.92–10.64; $p = 0.001$); were found to significantly affect the incidence of pruritus, while caesarean type (elective) (OR, 5.75; CI95, 1.13–3.37; $p = 0.017$) was found to significantly affect the incidence of nausea and vomiting. Our findings show that emotional status (anxious), caesarean indication (poor progress), blood group (AB) and caesarean type (elective) are the risk factors that should be incorporated into approaches for the prevention and surveillance of opioid's adverse effects after caesarean section.

Keywords: Opioid, Adverse effects, Caesarean section

PHARMACISTS' BARRIERS AND ATTITUDES TOWARDS RESEARCH IN KOTA KINABALU: A QUALITATIVE STUDY

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Pharmacists have been involved in improving patients' health care system in a variety of ways through the clinical research since years ago. Currently, the level of pharmacist's involvement in research is lowing Sabah. This qualitative study aimed to explore the pharmacists' attitudes and barriers towards research and to identify potential strategies to increase the research participation. Nine pharmacists from public services Kota Kinabalu were selected by purposive sampling and interviewed using a semi-structured interview guide until saturation of themes were reached. The session was audio-taped and notes were taken by researcher. Thematic analysis of the notes and audio-tape transcripts was

conducted. Two themes emerged around pharmacists' attitudes towards research: perspective and perception of the purpose of research. Most interviewees expressed that they are not interested in doing research as they underestimate or undervalue the importance of research. They are not aware how research can help in improving current health care system. Barriers to research participation were grouped into four themes: perception, communication, resources, and skill and knowledge. Strategies to address each of these barriers were suggested during this study. Strategies such as proper time management and providing adequate staffing in research were suggested to overcome the barriers to participation. Most interviewees were not aware of the importance of participation in research. Time needed to involve in research was noted to be one of the barriers for all interviewees. Practical strategies were suggested to overcome the barriers to participation and these strategies should be considered when promoting research participation.

Keywords: Pharmacist, Research, Attitudes and barriers, Ways to improve

RECENT NANOTECHNOLOGICAL APPROACHES FOR THE EFFECTIVE TREATMENT OF PERIODONTITIS

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Periodontitis is a dental disorder which affects the tissues surrounding and supporting the teeth (periodontium) such as gingiva, periodontal ligament, cementum, and alveolar bone. If left untreated, the disease will progress to result in the formation of periodontal pockets. This occurs due to the destruction of the gums, alveolar bone, and the outer layer of the tooth root, and consequently leads to the loss of teeth. Over the years, a vast variety of systemic and local delivery approaches for periodontal disease treatment have been proposed, investigated or developed. But most of them were characterised by limited effectiveness, poor bio-distribution, and lack of selectivity, among other limitations. Recent advances in nanotechnology suggest that nanodentistry will make it possible to maintain near perfect oral health through the use of nanomaterials, nanorobotics and nanoparticulate drug delivery approaches. Therefore, nanotechnology approaches would have a profound impact on dental diseases diagnosis, prevention, and treatment, and hence through its advances, it would be possible to provide high quality dental care to the millions of the world's population who are suffering from periodontal diseases. The advent of novel technological-nanocarriers such as liposomes, lipid and polymeric nanoparticles, nanocrystals, dendrimers, nanopores, nanotubes, nanoneedles and nanofibers as nanoparticulate drug delivery systems as promising impact in the management of periodontitis. The major aim of this review is to provide clinicians and academicians in the field of health sciences, with an insight of various investigated and future envisaged nanotechnology based targeted delivery systems for the treatment of periodontal diseases.

Keywords: Nanotechnology, Nanodentistry, Periodontal disease, Periodontitis, Nanoparticulate drug delivery system

DRUG UTILISATION REVIEW AMONG GERIATRIC PATIENTS IN PRIMARY CARE SETTING

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A retrospective medical records review study was conducted using the electronic Clinic Management System (eCMS) at three health clinics in Selangor state which are equipped with computerised system called Teleprimary Care. This study was aimed to examine the medications prescribed to geriatric patients aged 60 years and above attending the clinics in 2013. The Defined Daily Dose (DDD) per 1,000 inhabitants per day was calculated for each medication prescribed and was compared to the DDD value provided by the World Health Organization (WHO). The results showed that 2843 medications were prescribed and cardiovascular drug class was the most utilised, with rate of 46.5%. For individual medications, the top five most utilised medications (DDD) were amlodipine (2.553), lovastatin (0.759), metformin (1.077), perindopril (1.674) and atenolol (0.849). This implies that amlodipine was the most utilised medication and revealed that cardiovascular complication is one of the most common encountered non-communicable disease (NCD) complications among geriatric patients with 89.6% of patients has hypertension. Although all 5 medications were complied with the recommendations given by the national clinical guidelines, however the compliance rates to WHO DDD were below 50%. Thus, the medications prescribed to the geriatric patients should be reviewed from time to time to ensure appropriate prescribing.

Keywords: Drug utilisation review, Geriatric patients, Defined daily dose, Primary care

ASSOCIATION OF ERECTILE DYSFUNCTION AND ITS TREATMENT WITH POOR MEDICATION ADHERENCE TO CARDIOPROTECTIVE MEDICATIONS OF ISCHAEMIC HEART DISEASE

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Studying the causes of medication non-adherence in ischaemic heart disease (IHD) is an important area of research. Adverse effects due to medications are major impediments to adherence among heart disease patients. This study was carried out to examine the

predictive association of erectile dysfunction (ED) as an adverse effect with poor adherence to cardioprotective therapy. A hospital based cross-sectional study surveying 187 patients consecutively was implemented using questionnaires and a retrospective review of the medical files. Sociodemographic and clinical factors, anti-impotence medication use, ED as the focal covariate and adherence as an outcome were all assessed. More than 50% of the sample exhibited poor medication adherence by Morisky Medication Adherence Scale (MMAS-8). Nearly 40% had moderate/severe ED symptoms and 13.9% had a history of using anti-impotence drugs such as Tongkat Ali[®] and Viagra[®]. Ninety eight patients (53.4%) revealed adverse effects such as sexual disturbance which appeared 31 times. In a significant association, patients with poor adherence had a history of using anti-impotence medications (OR = 4.13), had experienced erectile or sexual disturbance upon using the cardiovascular medications (OR = 3.49), and had not previously experienced a coronary intervention (OR = 2.05). Patients who were prescribed with any of the renin-angiotensin-aldosterone blockers, however, were less likely to be poorly adherent (OR = 0.40). ED symptoms are common in IHD and the concern about the side-effects of cardioprotective medications on patient's erectile strength is growing. IHD patients without angioplasty or coronary artery bypass surgery, and those concerned to maintain their erectile function, were at high risk of being non-adherent to cardiovascular medications. These groups should receive intensive monitoring to detect drug-induced ED during outpatient follow-up.

Keywords: Ischemic heart disease, Erectile dysfunction, Medication non-adherence, Cardioprotective therapy, Adverse drug effect

IDENTIFICATION OF URINE METABOLITES TO PREDICT WARFARIN RESPONSE BASED ON THE INTERNATIONAL NORMALISED RATIO

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Warfarin is an anticoagulant agent used in the prevention and treatment of blood coagulation. Inaccurate dosing can lead to bleeding or blood clot due to its' narrow therapeutic index. Determination of certain urine metabolites associated with warfarin use may help identify individuals with stable and unstable International Normalized Ratios (INR). A number of 41 patients with stable INR (INR = 2–3) and 49 patients with unstable INR (INR<2 or INR>3) ratios, receiving warfarin therapy for a minimum period of 9 months and monitored for the last 6 months of treatment, and achieving score >6 on the Morisky scale (medium to high adherence) was included in this study. If INR remained unchanged (2–3), the patient was considered as a stable INR ratio and vice versa. Urine samples of the subjects were collected, centrifuged and mixed with phosphate buffer (1:2). NMR spectra of the samples were obtained and data were analysed using principle component analysis (PCA) and partial least squares discriminant analysis (PLS-DA). Twenty six male

and 15 female patients were stable, whereas the unstable group comprised of 29 male and 20 female patients. No significant difference in warfarin dose, age or gender was observed between the two groups. The PLS-DA (57.32% accuracy, 21.21% sensitivity, and 81.63% specificity) with R^2 (cum) = 0.0521 and Q^2 (cum) = 0.00183 did not detect a clear separation between the two groups. The urine metabolomics technique applied could not differentiate between the two groups based on their urine metabolite profiles. Further research for validation of the metabolites with more subjects is ongoing.

Keywords: Warfarin, International normalized ratio (INR), Metabolomics, Nuclear magnetic resonance (NMR)

EVALUATING THE EFFECT OF PLASMA DEPROTEINIZATION AND THE TYPE OF INTERNAL STANDARD USED ON NMR PROFILE OF RAT PLASMA

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The effect of deproteinization and the type of internal standard on the quality of rat plasma NMR profiles were investigated. A total number of nine male Sprague-Dawley rats were anaesthetised and blood samples were collected through cardiac puncture. To evaluate the effect of protein content of plasma on the quality of NMR spectrum, a portion of each plasma sample was deproteinized using acetonitrile. To assess the effect of internal standard on the quality of plasma NMR profiles, two sets of the plasma samples was prepared in two buffers, separately. Buffer A consisted of 4,4-dimethyl-4-silapentane-1-ammonium trifluoroacetate (DSA) and sodium azide (NaN_3), while buffer B was a mixture of 3-(trimethylsilyl)-1-propanesulfonic acid sodium salt (TSP) and NaN_3 . The pH of buffer solutions was adjusted to 7.4. 1D-CPMG NMR spectra were acquired on an AVANCE III 500 MHz spectrometer. The results showed that the broad signals of proteins and lipoproteins resonating at 0.80–0.90 ppm (VLDL/LDL- CH_3), 1.23–1.29 ppm (VLDL/LDL- CH_2 -), 1.96–2.18 ppm and 2.41–2.46 ppm were absent in the NMR profiles of the deproteinized plasma samples. However, the intensities of the signals related to ethanol (1.15–1.21 ppm), lactate (1.30–1.35 ppm), methylamine (2.55 ppm), β -glucose (4.64 ppm) and α -glucose (5.23 ppm) decreased. On the other hand, the signals at 1.46 ppm (alanine) and 3.53–3.58 ppm were lost. Comparison of the line widths at half height ($W_{h/2}$) of the internal standards revealed that the $W_{h/2}$ values of DSA was significantly smaller compared to those of TSP. To conclude, although deproteinizing plasma samples has the advantage of suppressing the signals of the macromolecules, it can also decrease the intensity of the small metabolites and results in the metabolites loss. As for the type of the internal standard, DSA seems to be more promising compared to the commonly-used internal standard, TSP.

Keywords: NMR spectroscopy, Rat plasma, Internal standard, Deproteinization

**QUANTITATIVE AND QUALITATIVE ANALYSIS OF THE USE OF ANTIBIOTICS FOR
DIARRHOEA PATIENTS SUBGROUP CHILDREN UNDER FIVE YEARS
HOSPITALISED IN RSUP PERSAHABATAN DURING JANUARY-DECEMBER 2013**

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The high use of antibiotics can lead to resistance of pathogenic bacteria and other negative impacts. One of the disorders that often treated with antibiotics is diarrhoea. The prevalence of diarrhoea in children under 5 years is 16.7% and the high use of antibiotics in diarrhoea, which reached 85.0% necessitate researcher to conduct quantitative and qualitative analysis of antibiotic use for diarrhoea in this population. In this study, data was analysed descriptively by retrospective study using the medical records of children under 5 years who received antibiotic therapy for diarrhoea. The quantitative aspect was assessed by calculating the Defined Daily Dose per 100 patients, and quality assessment with Gyssens category. Observations were carried out in the Medical Records department of "RSUP Persahabatan" East Jakarta with data retrieved retrospectively for a period of 1 year from January to December, 2013. The results showed that, from the 283 medical records obtained, the total antibiotic used was 20993 DDD 100 patient-days. The results of ATC/DDD for ceftriaxone was DDD 5.5785, 100 patient-days, metronidazole (2.6368), amoxicillin (0.4575), amikacin (0.2099), cefotaxime (7.3602), gentamicin (0.1038), cefixime (3.0883), ceftazidime (0.7473), chloramphenicol (0.2216), meropenem (0.4063), andampicillin (0.1228). Assessment result of category Gyssens showed 6% category I (appropriate antibiotics use), 1% category IIIa (not appropriate because the antibiotics use too long), 2% category IIIb (not appropriate because the antibiotic use too short), 9% category IVa (not appropriate because there are other, more effective antibiotics), 1% category IVc (not appropriate because there are other cheaper antibiotics), and 66% of category V (not appropriate because there was no indication/diagnosis of infection is not clear). In conclusion, this study found inappropriate use of antibiotic for diarrhoea in children under 5 years.

Keywords: Children under years, Diarrhoea, Antibiotic, Gyssens, ATC/DDD, RSUP Persahabatan

**INVESTIGATION ON THE EFFECTS OF *ORTHOSIPHONSTAMINEUS* EXTRACT
ADMINISTRATION ON DNA METHYLATION OF GESTATIONALLY STRESSED RATS**

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Evidence has shown that rosmarinic acid (RA) has the potential in alleviating depressive-like behaviour in animals. RA induces the antidepressant-like effect through modulating the hippocampus cell proliferation and up-regulation of BDNF levels. Patients with

depression generally show decreased neural BDNF levels, which are often correlates with an increased DNA methylation at specific BDNF promoter. RA also said to have an inhibitory effect on DNA methyltransferases activity; DNMT1 and DNMT3a which are responsible for DNA methylation. RA is one of the polyphenols found in *Orthosiphonstamineus*. An animal study is being carried out to investigate the effect of *O. stamineus* extract on the BDNF methylation and expression levels on the rat dams with “depressive-like behaviour.” Several groups of prenatally rat dams undergo a series of mild stressors until the day of parturition. The treatment of *O. stamineus* extract will then be administered to the dams once parturition has occurred, with fluoxetine as the positive control drug. We hypothesised that the administration of *O. stamineus* extract will induce similar changes in the DNA methylation and the expression of BDNF gene as conventional antidepressant. The findings of this study might add value to *O. stamineus* plant and expand the potential of developing new antidepressant drugs which are effective and safe for postpartum nursing mothers.

Keywords: Rosmarinic acid, Anti-depressant-like effect, BDNF gene regulation, DNA methylation

PROPIONIC ACID AND ACETIC ACID AS PLASMA BIOMARKERS FOR ALCOHOL-DEPENDENCE

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Currently, alcohol-dependence (AD) diagnosis depends on questionnaires and some biomarkers. However, both lack specificity and sensitivity. Metabolomics using nuclear magnetic resonance spectroscopy (NMR) may provide novel technique for the diagnosis of AD. The study aims to find novel biomarkers of AD in plasma. Blood samples of 30 alcohol-dependent, 54 social drinkers and 60 controls were collected. Plasma samples were obtained and analysed by NMR. Data analysis was done using multivariate analysis including principal component analysis (PCA) and orthogonal partial least square discriminate analysis (OPLS-DA) followed by univariate and multivariate logistic regression. The OPLS-DA model revealed 39 bins with variable influence on projection (VIP) value more than 1, significantly discriminated AD from social drinkers and controls. The sensitivity, specificity and accuracy of the model were 64.3%, 98.2% and 91.2%, respectively. In the univariate logistic regression analysis, 9 peaks were significantly associated with AD with the p value ≤ 0.1 . In the multivariate logistic regression analysis, 4 regions were significantly associated with AD with area under the receiver operating coefficient (AUROC) of 0.961. The sensitivity, specificity and accuracy of the model were 78.6%, 98.2% and 94.2%, respectively. From the four significant regions, two biomarkers (propionic and acetic acid) were identified using the B-BIOREFCODE, the ChemoX, the BMRB databases and 2D HSQC spectra. The study showed that plasma metabolomics

was able to find novel biomarkers of AD. These biomarkers if validated, they will aid the precise diagnosis of AD in the future.

Keywords: Alcohol-dependence, Metabolomics, Phenotyping, Nuclear magnetic resonance, Diagnosis

NOVEL BIOMARKERS OF ALCOHOL-DEPENDENCE IN URINE USING METABOLOMICS

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The current methods of alcohol-dependence (AD) diagnosis are questionnaires and some biomarkers. However, both lack specificity and sensitivity. Metabolomics may provide a novel method for diagnosis of AD by using nuclear magnetic resonance spectroscopy (NMR). The study aims to identify novel AD biomarkers in urine. Urine samples were collected from 30 alcohol-dependent, 54 social drinkers and 60 controls and analysed by NMR. Data analysis was done using multivariate analysis including principal component analysis (PCA) and orthogonal partial least square discriminate analysis (OPLS-DA) followed by univariate and multivariate logistic regression. The OPLS-DA model revealed 59 bins with VIP value more than 1 significantly discriminated AD from social drinkers and controls. The sensitivity, specificity and accuracy of the model were 86.2%, 97.2% and 94.9%, respectively. In the univariate logistic regression analysis of urine, 30 regions were significantly associated with AD with the p value ≤ 0.1 . The PCA revealed five PCs were significantly associated with AD. In the multivariate logistic regression analysis, 2 PCs which consisted of 18 regions were significantly associated with AD with AUROC of 0.909. The sensitivity, specificity and accuracy of the model were 65.5%, 99.1% and 92.0% respectively. From the 18 significant regions, six biomarkers cis-aconitic acid, citric acid, alanine, lactic acid, 1,2-propanediol and 2-hydroxyisovaleric acid were identified using the B-BIOREFCODE, the Chenomx, the BMRB databases and 2D HSQC spectra. The study showed that urine metabolomics technique was able to identify novel biomarkers of AD. Validation of these biomarkers will help in AD diagnosis.

Keywords: Alcohol-dependence, Metabolomics, Phenotyping, Nuclear magnetic resonance, Diagnosis

**ANALYSIS OF ANTIBIOTIC USE IN CHILDREN WITH PNEUMONIA AT PORT
HOSPITAL JAKARTA
DURING JANUARY-DECEMBER 2014**

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In Indonesia, pneumonia is one of the 10 major causes of death in hospitalised patients. Antibiotics are drugs that are very instrumental in fighting infections caused by bacteria. Excessive use of antibiotics in children appears to be increasing and worrisome. This study was conducted in children with pneumonia at Port Hospital Jakarta in 2014 with the aim to evaluate the use of antibiotics and to determine the rationality. This research is a descriptive study with retrospective data collection based on the medical records. A total of 76 medical records of children with pneumonia, who met the inclusion criteria, were included in this study. The results showed the use of antibiotics are at 26.022 DDD/100 KPRI and type of antibiotics that has a value of DDD/100 patients higher than the standard set by the WHO were ceftriaxone (9.276), azithromycin (5.132), cefixime (3.158) and erythromycin (1.263). Class of antibiotics that are included in the DU90% segment is cephalosporin (64.976% of the total usage), and macrolides (25.333%). Evaluation of rational use of antibiotics based on precise criteria found that antibiotics were given to the right patients (100%), for the right indication (100%) and the right medication (100%). Inappropriate use of antibiotics dose was found with cefixime (23.53%) and gentamicin (33.33%). Appropriate duration of administration was found with azithromycin (82.14%), amoxicillin and enzyme inhibitor (100%), erythromycin (100%), cefadroxil (100%), amoxicillin (100%), cefpodoxime proxetil (100%) and clarithromycin (100%). The present study found irrational uses of antibiotics in children with pneumonia at Port Hospital, Jakarta.

Keywords: Rational use of antibiotics, Pneumonia, ATC/DDD

**ANALYSIS OF INPATIENT UNIT COST IN PASAR REBO DISTRICT GENERAL
HOSPITAL IN JAKARTA IN THE YEAR 2003**

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Hospital has been known as a complex organisation, which is a very important component in health services. In general a hospital must be supported with good financial system. Since 1998 Indonesia has faced fluctuation in the inflation rate. The impact of this situation is in the increase of the goods and services price causing the prices of food changes every year. With this limitation, hospital nutrition unit need to be accurately allocated with fund to achieve more efficient and effective services. From financial data, it is known that the third class inpatient wards having financial deficit of Rp. 106,593,262,-. The aim for this research is to describe the food cost needed for each class of the inpatient ward at the Pasar Rebo district general hospital in the year of 2003. This research was conducted using descriptive-quantitative study design from February until May 2004. The analysis

was done by Activity used Costing (ABC) using secondary data. The results are shown as actual and normative with and without investment. Actual unit cost without investment was Rp. 44,361,-, Rp. 35,422,-, Rp. 30,838,- for class 1, 2 and 3 respectively, which is actual unit cost of food class 3 subtract price which is Rp. 10,838,-. To cover this cost, government develop a cross-subsidy policy but with the current issue of self-supporting hospital to become BUMD hospital, the budget should be more efficiently and effectively managed. The result of this research may provide consideration to government and to Health Department on cost of food, and also to hospital director in deciding patient tariff.

Keywords: Inpatient, Unit cost, Meals, Hospital

IMPACT OF EDUCATION INTERVENTION ON REDUCING MEDICATION ADMINISTRATION AND PREPARATION ERROR RATES IN ADULT INTENSIVE CARE

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Preparation and administration of intravenous medicines in critical care are prone to errors. Lack of knowledge of practical procedures was among the common causes of medication preparation and administration errors. A direct observational study using pre-post intervention design was conducted in adult intensive care at a teaching hospital in Kuala Lumpur to evaluate the effect of education intervention on the rate and type of parenteral medication preparation and administration error, adherence to good practice and accuracy of drug infusion concentrations. Random samples of 122 parenteral medication doses prepared and administered by nurses before education intervention and 105 doses prepared and administered post-intervention was observed and assessed for appropriateness. Forty drug infusion samples were collected pre-intervention and 15 samples post-intervention for concentration analysis. The education intervention comprised a Power Point presentation, a video presentation and a bookmark-sized memory aid providing guideline on the preparation and administration of commonly used parenteral medications in intensive care. The preparation and administration error rate decreased from 79% (96/122) to 51% (56/105) after education intervention ($p < 0.001$). Most error types (incorrect preparation, incompatibilities and incorrect time) were significantly reduced post-intervention ($p < 0.05$) except for incorrect administration rate and incorrect dose. There was a significant improvement in nurses' adherence to good practices post-intervention ($p < 0.05$). There was no significant difference in drug infusion concentration errors prepared pre- and post-intervention ($p = 0.21$). This study suggests that theoretical teaching seemed to reduce medication errors but other measures need to be considered to improve the quality of drug infusions.

Keywords: Medication error, Medication administration error, Intensive care unit, Intervention

**MANAGEMENT OF PAIN TREATMENT FOR POST ABDOMEN SURGERY PATIENTS
FROM JANUARY TO MARCH 2015 IN ISLAMIC HOSPITAL CEMPAKA PUTIH,
JAKARTA**

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Pain is an unpleasant sensory and emotional experience, which is associated with actual or potential tissue damage. Almost all of abdomen surgeries are implicated with pain, which need analgesic. Pharmacological therapy includes giving non-opioid analgesic, adjuvant and opioid. Polypharmacy, drug interactions between drug and drug or drug and disease, changes in metabolism caused by age, the incidence of side effects of the drug need to be considered wisely. The purpose of this study is to evaluate management of pain treatment for post abdomen surgery patients in Islamic Hospital Cempaka Putih Jakarta from January to March 2015. A prospective observational study was used for this purpose. A total of 50 post abdomen surgery patients were considered for analysis consisting of 13 appendicitis patients and 37 caesarean patients, who were given opioid and NSAID to reduce their pain. There was a significant correlation between type of surgery and intensity of pain post abdomen surgery ($p = 0.001$). Side effects of analgesic correlate with the analgesic given (p value = 0.01). Besides that, management of side effect of analgesic has significant correlation with side effect ($p = 0.003$). There was also a significant relationship between scale of pain and analgesic given ($p = 0.009$). It was also found that there was significance relationship between scale of pain before and after given analgesic ($p = 0.001$). It can be concluded that pain intervention increases patient's quality of life.

Keywords: Pain, Analgesic, Abdomen

USE OF COMPLEMENTARY AND ALTERNATIVE MEDICINES AMONG PATIENTS VISITING EMERGENCY DEPARTMENT: SYSTEMATIC REVIEW

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The use of complementary and alternative medicine (CAM) is significantly growing worldwide. Many studies have been conducted in health care settings with regards to CAM use among patients. However, information regarding CAM use among patients in the emergency department (ED) is scarce. The aim of this review was to conduct a systematic review of published studies with regards to CAM use among the ED patients. Literature search of published studies from inception to September 2015 was conducted using PubMed and manual search of reference list. Seventeen studies that met the inclusion criteria were reviewed. The average prevalence rate of CAM use among ED patients across the studies was 39.9% and a range of 11.9% to 68.1%. Herbal therapy was the sub-modality of CAM most commonly used and frequently implicated in CAM-related ED visits. Higher education, age, female gender, religious affiliation and chronic diseases were the most frequent factors associated with CAM use among the ED patients. Over 80% of the ED physicians did not ask the patients about the CAM therapy. Similarly, 80% of the ED patients were ready to disclose CAM therapy to the ED physician. The prevalence rate of CAM use among ED patients is high and is growing with the current increasing popularity, and it has been a reason for some ED visits. There is a need for the health care professionals to receive training and always ask the patients about CAM therapy to enable them provide appropriate medical care and prevent CAM-related adverse events.

Keywords: Complementary medicine, Alternative medicine, Traditional medicine, Emergency department, Prevalence

PROGRESSION AND OUTCOMES OF NON-DIALYSIS DEPENDENT CHRONIC KIDNEY DISEASE PATIENTS

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Chronic Kidney Disease (CKD) is a global health concern that arises due to multitude of different insults to renal function. Progression of CKD to end stage renal disease (ESRD) is a costly and important clinical event that makes it important to investigate prognosis of earlier stages of CKD. A single centre longitudinal observational study was conducted to identify outcomes of CKD patients and prognostic markers of CKD progressions. All subjects with estimated eGFR between 15 and 59 mL/min/1.73m² during a 2 year study period (2004–2005) were identified from hospital database. Patients were followed up for 10 years or until ESRD or death, whichever occurred first. A total 621 patients (mean age: 61.09±6.57 years, male: 40%) with CKD stage 3 (n = 438) and stage 4 (n = 183) were included in current study. Annual cumulative decline in eGFR was 3.01±0.40 mL/min/1.73m². Patients with CKD stage 3 were more likely to progress to ESRD while mortality was more common in CKD stage 4 patients. According to Cox regression analysis, patients with CVD (HR: 2.01, *p* = 0.02), higher systolic blood pressure (HR: 1.06, *p* = 0.04), elevated phosphate levels (HR: 1.24, *p* = 0.01), heavy proteinuria (HR: 3.09, *p* = 0.03), microscopic hematuria (HR: 2.07, *p* = 0.02) and diuretics therapy (HR: 2.01, *p* = 0.01) were more likely to develop ESRD. Prime importance should be given to mild forms of CKD to retard and even reverse CKD progression. Prior knowledge of expected clinical profile and risk factors of disease progression might help clinicians to identify high risk patients, leading to decrease rate of disease progression and mortality.

Keywords: Chronic kidney disease, End stage renal disease, Outcomes, Progression

PREVALENCE OF MALNUTRITION IN SURGICAL POPULATION AND ITS IMPACT OVER EARLY POST-OPERATIVE OUTCOMES AT A TERTIARY CARE HOSPITAL IN MALAYSIA

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A prospective observational study was conducted at Hospital Universiti Sains Malaysia (HUSM) over the period of 4 months. All adult surgical patients (18–75 years; mean =

45.8, median = 48) were screened for the malnutrition risk within 48 hours of their admission using Malnutrition Universal Screening Tool (MUST) and Nutritional Risk Index (NRI); results of which were eventually compared to the actual number of malnourished patients which had low levels of albumin and were officially diagnosed by an appointed nutritionist. Early postoperative outcomes were development of surgical site infection (SSI), total length of hospital stay (LOS) and mortality. Results indicated that out of total 220 patients enrolled, 64 (29.1%) patients were malnourished. According to MUST, total of 37.3% patients were at risk of developing malnutrition (with high, medium and low risk as 27.3%, 10.0% and 62.7% respectively), while according to NRI 26.4% patients were at risk (with high, medium and low risk as 13.2%, 13.2% and 78.2% respectively). Malnourished patients exhibited significantly increased LOS ($p < 0.001$), SSI rate ($p < 0.01$) and mortality ($p < 0.001$). NRI was able to identify patients at risk (26.4%) as close to the actual percentage (29.1%) of malnourished patients (high specificity) than MUST which identified greater percentage (37.3%) to be at risk (high sensitivity). However in predicting post-operative outcomes, NRI only showed significant relationship towards increased LOS ($p < 0.01$) but failed to predict other outcomes like SSI ($p = 0.495$) and mortality ($p = 0.154$) while MUST showed significant relationship ($p < 0.05$) with all of the post-operative outcomes. As per our results, prevalence of malnutrition in surgical population in our setting is high and it significantly increases the risk of post-operative outcomes. Tools like MUST or NRI should be practiced in routine clinical practice for early detection of patients at risk of malnutrition so they could be treated accordingly to decrease the risk of post-operative complications.

Keywords: Prevalence, Malnutrition, Morbidity, Mortality, Surgery, MUST, NRI

SYSTEMATIC REVIEW OF MEDICATION PAYMENT METHOD AND ITS INFLUENCE ON PATIENTS' MEDICATION ADHERENCE

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This study aims to review previous research reporting the influence of different methods of payments and its association to patients' medication adherence behaviour. The study was conducted as systematic review of published articles on the influence of medication payment method on patients' adherence to medication. Relevant published articles were located through three electronic databases which are Medline, Proquest Medical Library and Science Direct since inception to February 2015. Included articles were then reviewed and summarised narratively. Of the total of 2683 articles traced, 21 articles were included in the final analysis. There were four types of medication payment methods reported in included studies: i) co-payments or out-of-pocket expenditure, ii) drug coverage or insurance benefit, iii) prescription cap iv) free of charge or full medication subsidies. The review found that patients who pay more than USD 20 had lower benefit coverage limit or limited drug coverage and they were more likely to experienced non-adherence to medication. Surprisingly patients who received medication at free of charge were also found to be non-adherent to their medication especially patients with non-severe illnesses.

Although burden was assumed to increase when patients need to pay their medications at higher cost, the non-adherence rate among patients who received medication at no charge was found to be high. Future studies comparing factors that may influence patients' adherence to medication among patients who received medication subsidies should be done to develop strategies to overcome medication non-adherence among patients with no monetary constraints.

Keywords: Methods of payment, Drug cost and medication adherence

A STUDY ON THE HERBAL DRUGS UTILISATION IN HEALTH CARE PROFESSIONALS (PHYSICIANS/ACADEMICIANS) IN AIMST UNIVERSITY, SUNGAI PETANI, KEDAH DARUL AMAN

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A total of 168 healthcare professional (physician/academician) were interviewed. The results showed that 150 (89.2%) used herbal drugs while 18 (10.8%) were non-users. The male respondents were 85 (86.7%) and female 65 (92.9%) while utilisation of herbal drugs was 56.1%, 43.9%, respectively. Majority 99 (86.1%) were Indians. They utilised 66.0% more herbal drugs as compared to other nationalities. The highest rate of utilisation of herbal drugs was 52.0% within the age groups of 31–40 years and was least in age group of 30 years. The respondents 68 (90.7%) from Faculty of Medicine utilised herbal drugs 45.3% more as compared to other faculties. Less experienced respondents 45 (84.9%) up to 5 years showed more utilisation of herbal drugs. Mostly respondent holding Master 102 (85.7%) and PhD 25 (88.1%) utilised herbal drugs as 68.9%, 16.9%, respectively. The respondents engaged in academics were 143 (87.7%) and utilisation was 96.6%. Mostly respondents used herbal drugs for cough and common cold. The respondents agreed upon mild illness 90 (93.8%), cost effectiveness 69 (98.1%) and familiarisation with treatment options were 61 (96.8%) while utilisation was 66.7%, 53.1%, 51.7%, respectively. The respondents utilised oral solid 131 (88.5%) as compared to oral liquids 53 (35.8%) and external preparations 19 (12.8%). The utilisation of herbal drug among respondents 108 (63.8%) was common with nutritionals. Descriptive, inferential and binary logistic regression analysis was carried out using Statistical Package for the Social Sciences (SPSS) version 20.

Keywords: Academics, Health care professionals, Herbal drugs, Medicine

PHARMACOMETABONOMICS ANALYSIS OF URINE TO PREDICT CLOPIDOGREL HIGH ON TREATMENT PLATELETS REACTIVITY (HTPR) IN CORONARY ARTERY DISEASE PATIENTS (CAD) UNDERGOING INTERVENTIONAL ANGIOGRAPHIC PROCEDURE

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Clopidogrel antiplatelet drug is limited by variable response among patients. This leads to poor patient outcome on treatment platelets reactivity (HTPR). Finding putative biomarkers of HTPR might aid to individualise antiplatelet therapy. Pharmacometabonomics metabolic finger printing (metabotyping) of urine samples using nuclear magnetic resonance (NMR) spectroscopy can be used to predict HTPR. We aimed to identify putative metabotype which is predictive of HTPR in urine. Urine samples were collected from 70 coronary artery disease (CAD) patients that were planned for interventional angiographic procedure before loading them with clopidogrel 600 mg. Patients response to clopidogrel was assessed using the VerifyNow[®] system P2Y12 testing kit, 6 hours after the loading. Two HTPR cut off points were evaluated; PRU value >208 and percentage of inhibition (%Inh) ≤15%. Urine samples were mixed with phosphate buffer then analysed using NMR spectroscopy. Partial least square discriminate analysis (PLS-DA) of the spectroscopic data for the two cut off points was done to indicate the best discriminating metabotype. The PLS-DA model of PRU >208 showed discrimination with 95.45% specificity, 15.38% sensitivity, and 65.71% accuracy ($R^2Y = 0.043$ and $Q^2 = 0.00672$). The PLS-DA model of %Inh ≤15 showed discrimination with 90.91% specificity, 83.78% sensitivity, and 87.14% accuracy ($R^2Y = 0.443$ and $Q^2 = 0.204$). Pharmacometabonomics analysis of urine was able to differentiate between HTPR and responsive patients. The HTPR cut off point of %Inh ≤15 indicated better pharmacometabonomics discrimination accuracy than PRU >208. The identification of predictive metabolites, and the genetics and non-genetics factors associated with the HTPR are ongoing.

Keywords: Clopidogrel, Platelets function testing, VerifyNow system, Pharmacometabonomics, Nuclear magnetic resonance, Personalised therapy

EVALUATION OF CAREGIVERS' KNOWLEDGE, ATTITUDE, AND PRACTICE ON MEDICATION ADMINISTRATION PROCESS IN LONG-TERM CARE FACILITIES IN MALAYSIA

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The study was a cross-sectional survey conducted at long-term health care facilities at Pulau Pinang, Selangor, Kuala Lumpur, Malaysia. The aim of the study was to assess the level of knowledge, attitude, and practice (KAP) on medication administration process among the caregivers at long-term care facilities by using a validated self-administered questionnaire, which consists of three sections. Section 1 consisted of respondent demographics; section 2 consists of questions to assess respondent knowledge towards medication administration process whereas section 3 consisted of statements on caregivers' attitude and practice using five-point Likert Scale (1 = strongly agree to 5 = strongly disagree). A total of 26 long-term care facilities agreed to participate in the survey, of which 165 caregivers responded to the questionnaires. Ten questionnaires were found to have missing values, and were excluded. Out of the remaining 155 participants, majority (n = 108, 69.7%) were females. Moreover, 66.5% of the respondents were categorised as general caregivers (including part time workers) and 33.5% were nurses (including clinical manager and nurses). We found out that, 71.7% was within the poor knowledge range. The mean knowledge score for the entire study was 16.6, though the maximum score was 30. Attitude were assessed by using Likert scale to assess satisfaction value, the maximum score was 50. Overall the participants had a mean score of 26.7. Whereas, the maximum score for practice was 75, respondents had a mean score of 48.7. Despite performing medication administration activities, the caregivers demonstrated less knowledge, positive attitude towards medication administration but had poor practices which should be implement in long-term care facilities.

Keywords: Caregivers, Knowledge, Attitude, Practice, Nursing home

AN EVALUATION OF PRACTICES, PERCEPTIONS AND KNOWLEDGE ABOUT THE USE OF ACETAMINOPHEN (PARACETAMOL) AMONG THE CONSUMERS IN PULAU PINANG, MALAYSIA

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Acetaminophen is the common over-the-counter pain killers. The self-medication practice using acetaminophen is expected to increase leading to high healthcare cost. However, self-medication without proper information could increase risk of acetaminophen poisoning. Hence, this study was conducted in Pulau Pinang, Malaysia to evaluate the

consumers' practices, perceptions and knowledge of acetaminophen. This study was divided into two parts. In part I of the study, a survey using a questionnaire was conducted among 400 consumers via convenient sampling. The second part of the study was a qualitative semi-structured interview conducted among 14 consumers. Part I of the study revealed that the majority of consumers perceived acetaminophen as a safe drug to use and very effective for mild and moderate pain. The minority of them found to have over-consumed the total daily dosage of acetaminophen 500 mg and 650 mg tablets. Nevertheless, most of the consumers had lack of knowledge regarding dosage, precautions, signs and toxicities of acetaminophen. The part II study showed that the consumers had a positive attitude towards the popularity, safety and efficacy of acetaminophen. However, they had difficulty in recognising various generic products available in the market. Some consumers claimed that they will double the dose or take it more frequently if their conditions persisted. Besides, the product package label for certain acetaminophen products were not attractive and informative enough for the consumers. The consumers suggested that the Ministry of Health Malaysia should established educational tools on the proper use of acetaminophen. In conclusion, the consumers' understandings about acetaminophen need to be improved in order to avoid potential unsafe use of such products.

Keywords: Acetaminophen, Paracetamol, Practices, Perceptions, Knowledge, Consumer

A POTENTIAL OF *MONOPTERUS ALBUS* EXTRACT AS AN APHRODISIAC AGENT

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Monopterus albus or locally known as Asian swamp eel has been reputed since ancient time to have an aphrodisiac property. However, there is no scientific evidence to prove this claim. Therefore, the present study was conducted to evaluate aphrodisiac effect of *M. albus* extract along with its acute toxicity. Two types of extractions were used; aqueous and lipid. Three doses of each *M. albus* extract, respectively; 50, 100, 200 mg/kg were administered (*i.p.*) to male mice for mounting behaviour test. Sildenafil citrate or Viagra® (5 mg/kg) being positive control while the negative control group received saline solution. The mounting behaviour test was carried out one hour after the administration of respective dose. The mice treated with aqueous and lipid extract of *M. albus* at all doses exhibited mounting behaviour. All three doses of lipid extracts and higher dose (200 mg/kg) of aqueous extract administered displayed significant difference ($p < 0.05$) from the negative control. Despite this, only the lipid extract of 50 mg/kg showed significant difference ($p < 0.05$) with positive control. This signifies that aqueous and lipid extracts especially in dose 200 mg/kg have a substantial effect of aphrodisiac property. In addition, lipid extract also devoid of any adverse effects of toxicity. The findings from this study provide scientific evidence that lipid extract of *M. albus* could be used as an alternative medication of natural product for promoting sexual activity in men.

Keywords: *Monopterus albus*, Aphrodisiac, Mounting behaviour, Lipid extract

PREDICTOR OF UNSUCCESSFUL TREATMENT OUTCOME OF TUBERCULOSIS PATIENTS IN YEMEN

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Tuberculosis (TB) is a contagious disease caused by an organism called *Mycobacterium tuberculosis* (tubercle bacilli). Yemen is situated in WHO Eastern Mediterranean Region and rank as an intermediate TB burdened countries. The study was conducted to describe the clinical features and to find the predictors of successful and unsuccessful treatment outcome of tuberculosis in Yemen. A Prospective multicenter study was conducted among TB patients for predicting the factors affecting the treatment outcome. Study was conducted in two major prevalence TB cities in Yemen i.e. Alhodiah and Taiz city from first of May 2013 to end of April 2014. Patients were identified during their registration in TB health center after the confirmation of their TB diagnosis, and were followed up until the end of their treatment. A total of 413 smear positive, smear negative and extra pulmonary tuberculosis were involved in the study. The responses rate among overall TB patients in the beginning of treatment was 67%. Patients were interviewed again in the end of intensive phase and end of treatment. Result shows that female (p -value, 0.004), secondary education level (p -value, 0.008), non-employment (p -value, 0.005), smoking cigarette more than 20 (p -value, 0.012) and comorbid (p -value, 0.05) were the predictors of unsuccessful treatment outcome. Several clinical complications can be associated with TB leads to unsuccessful outcome which may result in mortality. Our finding is expected to be useful for health care providers and pharmacist in predicting and managing the factors which play role in unsuccessful treatment outcome.

Keywords: Tuberculosis, Intensive phase, Comorbid, Yemen, Smear negative, Smear positive, pulmonary, Extra pulmonary

TUBERCULOSIS TREATMENT OUTCOMES BASED ON GENDER DIFFERENCE: A RETROSPECTIVE ANALYSIS FROM PAKISTAN

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The aim of current study is to observe the gender differences among TB patients and to evaluate the relation between TB patient gender and treatment outcome. A retrospective cohort study of all patients suffering from pulmonary and extra pulmonary TB patients, patients co-infected with HIV, hepatitis, and diabetes mellitus were included for current study that were treated at Khyber teaching hospital, Peshawar, Pakistan. On the basis of our study objective patients were categorised on gender basis and association with their

demographics and clinical characteristics was observed. Treatment outcomes were evaluated on basis of smear testing at the end of treatment and the results were compared with TB patients' gender. A total of 472 TB patients fulfilled the inclusion criteria, which included 238 (50.4%) male and 234 (49.6%) female patients. Two hundred and twenty eight (48.3%) male patients and 230 (48.7%) female patients were new TB cases whereas 224 (47.4%) male and 216 (45.6%) female patient TB type was pulmonary. TB patient age group, employment status and smoking status had a statistical significant association with gender ($p = 0.002$, $p = 0.02$, $p < 0.001$ respectively). The strongest predictor that affected TB patient gender was age group >55 years ($OR = 0.45$, $p = 0.001$). Of 472 TB patients, 152 (32.2%) male patients and 136 (28.8%) female patient treatment outcome was unsuccessful whereas 86 (18.2%) male and 98 (20.7%) female patient treatment outcomes were successful. There was no statistical relation observed among treatment outcome and gender. The ratio of male to female TB patients in current study was almost same. Comparatively, the treatment failure rate was high in male as compared to female TB patients.

EFFECTIVENESS OF FOLIC ACID IN ANEMIA TREATMENT AMONG HEMODIALYSIS PATIENTS AT ISLAMIC HOSPITAL CEMPAKA PUTIH JAKARTA

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Hemodialysis is used as therapy to substitute the decrease of renal function in end-stage renal disease (ESRD) patients. Anemia is commonly found in ESRD patients (80%–95%) with many factors involve in its pathogenesis. Treatment with recombinant human erythropoietin (*rHU-EPO*) has led to an increase in hemoglobin (Hb) level and improvement of patients' quality of life. Unfortunately *rHU-EPO* is relatively expensive which limits its use in practice. The purpose of this study is to determine the efficacy of folic acid in managing anemia among ESRD patients using a prospective observational study. A total of 54 patients were considered for analysis at the hemodialysis ward of Islamic Hospital Cempaka Putih Jakarta. Twenty two patients (40.7%) were given folic acid while 32 patients (59.2%) received both folic acid and *rHU-EPO*. It was found that there is a significant increase of hemoglobin level in both groups of ESRD patients with anemia who were given either the folic acid therapy (mean values before and after treatment of 8.214 and 9.786, respectively) or folic acid and *rHU-EPO* therapy (7.681 and 9.603, respectively). There is no significant relationship between gender and increase of hemoglobin ($p = 0.133$ for the folic acid group and $p = 0.984$ for the folic acid and *rHU-EPO* group). Similarly no significant relationship was observed between age and increase of hemoglobin level ($p = 0.099$ for folic acid group, $p = 0.400$ for folic acid and *rHU-EPO* group). In conclusion, folic acid is effective in increasing hemoglobin level of ESRD patients, although it is not more effective than *rHU-EPO*.

Keywords: Anemia, RHU-EPO, ESRD, Hemoglobin

**HOSPITAL PHARMACISTS' PREPAREDNESS TO PROVIDE CONTEMPORARY
ADVICE ON THE CLINICAL USE OF VANCOMYCIN: THE IMPACT OF A TARGETED
CONTINUING EDUCATION MODULE**

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This study aimed to determine self-reported confidence of pharmacists in providing contemporary advice on vancomycin and evaluate pharmacists' knowledge to provide contemporary advice on vancomycin following a targeted continuing education (CE) module. The study was a prospective two-phase design conducted in an Australian hospital. Phase one involves pharmacist self-reported confidence to survey questions using a Likert scale on providing contemporary advice on vancomycin. Phase two involves provision of an online CE vancomycin module containing knowledge-based assessment. Likert scales recorded self-reported confidence reported as mean and standard deviation. Response rates for surveys; confidence $n = 35$ (72.9%) and knowledge $n = 31$ (58.5%). In phase one, confidence was highest regarding vancomycin dosing and monitoring with 71.4%–81.6% of respondents agreeing or strongly agreeing they were confident in those domains. Respondents were least confident regarding intravenous administration and infusion related reactions, 57.1% and 45.7% respectively. Respondents who provided advice on vancomycin >10 times in the prior 12 months reported significantly higher confidence in; therapeutic range 1.4 (SD 0.5) vs 1.9 (SD 0.7) $p = 0.01$, interpreting concentrations to amend dosage 1.5 (SD 0.5) vs 2.5 (SD 0.5) $p = <0.01$, and providing general advice to doctors 1.9 (SD 0.5) vs. 2.4 (0.6) $p = <0.01$. Knowledge questions were answered correctly post CPD by >75% of pharmacists. In conclusion, pharmacists' self-reported confidence to managing vancomycin was variable but generally high. Introduction of an accredited CE module on vancomycin, assessing knowledge using a clinical vignette translated into consistently high responses. CE can consolidate confidence and knowledge while providing a self-affirming value of existing knowledge and practice.

Keywords: Antibiotic, Confidence, Continuing education, Knowledge, Vancomycin

MOBILE APPLICATIONS (APPS) FOR ASSESSMENT OF ADVERSE DRUGS REACTIONS (ADRS): CAUSALITY, SEVERITY AND PREVENTABILITY ASSESSMENT

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Adverse drug reactions (ADRs) remain a major challenge in drug safety as they cause significant morbidity and mortality. Current research showed that proper ADR assessment is important in the effort to reduce the burden of ADRs. This study aimed to develop a mobile and easily accessible Application (Apps) to assist in assessing causality, severity and preventability of ADRs. The crucial elements in ADRs studies are to identify the causal relationship, the intensity and the preventability of an ADRs. We designed mobile Apps using evidence-based and standardised tools or algorithm; namely the Liverpool ADRs Causality Assessment Tool, Hartwig's Severity Assessment Scale and Modified Schumock and Thronton Preventability Scale. The Apps designed using MIT App Inventor were then uploaded from APK file into a Google Developer Console and published into Google Play. The Apps developed for ADRs assessments were named Adverse Drug Reaction Causality, Adverse Drug Reaction Severity and Adverse Drug Rxn Preventability. All are now available for free by downloading through Google Play since April 2015. To date they have been rated from 4.5–5.0 stars with 217 total downloads from various countries. The Apps are currently being used in a prospective study of ADRs among paediatric patients at Hospital Ampang, Malaysia. These Apps for ADRs assessment will improve detection, assessment and potentially, avoidance of ADRs. Further work are ongoing in validating and improving the Apps, with the aim to reduce the burden of ADRs thus ensuring drugs are used in the safest and most effective manner.

Keywords: Adverse drug reaction, Drug safety, Causality, Severity, Preventability

PLASMA METABOLITES IDENTIFICATION FOR PATIENTS ON WARFARIN WITH STABLE AND UNSTABLE INTERNATIONAL NORMALISED RATIO

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Warfarin is an anticoagulant with wide inter-individual variation in drug response, monitored based on International Normalised Ratio (INR). The aim of this study is to

determine the ability of plasma metabolites to distinguish individuals with different INR stability. Two groups of patients; stable INR (2–3) and unstable INR (<2 or >3), on at least 9-month warfarin treatment and monitored for the last 6 months of treatment, and with Morisky scale >6 (medium to high adherence) were included. An INR case without changes was considered stable. Otherwise, it would be considered unstable. Blood samples were collected, centrifuged and mixed with phosphate buffer (1:1). NMR spectra were obtained and the data were analysed using principle component analysis (PCA) and partial least squares discriminant analysis (PLS-DA). A total of 44 stable patients, and 50 unstable patients were included in this study. Fifteen female and 29 male patients showed a stable INR; while the unstable group consist of 28 males and 22 females. No significant difference in warfarin dose, age or gender was observed between the two groups. The PLS-DA (68.18% sensitivity, 86.96% specificity, and 77.78% accuracy,) with R^2 (cum) = 0.332 and Q^2 (cum) = 0.128 revealed a clear separation between the two groups. The plasma metabolomics technique able to differentiate the plasma metabolic profiles of the patients on warfarin with stable and unstable INR. Validations of the metabolites with more subjects are ongoing.

Keywords: Warfarin, International normalised ratio (INR), Metabolomics, Nuclear magnetic resonance (NMR)

THE CLINICAL PHARMACOKINETIC ASPECT OF DRUGS IN HYPERTENSIVE PATIENTS BASED ON RENAL FUNCTION AT THE INPATIENT INSTALLATION OF DR. M. DJAMIL PADANG HOSPITAL

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Hypertension is a common disease suffered by patients at the inpatient installation of DR. M. Djamil Padang Hospital. Drugs given to these patients may affect the patients' renal function. This study aimed to determine whether the antihypertensive drugs administration has an effect on patient renal function during their stay at the inpatient installation of DR. M. Djamil Padang Hospital. The study was an observational study by using judgment sampling method of prospective data. It was performed from December 2010 to March 2011. A total of 51 hypertensive patients were included in this study. Patient renal function based on their creatinine clearance can be classified into stage I (2 patients), stage II (4 patients), stage III (19 patients), stage IV (8 patients), and stage V (18 patients). There was a decrease in patient renal function for 35.29% during their stay. This might be due to the use of nephrotoxic drugs and drugs which are excreted by kidney greater than 70% such as furosemid/Lasix[®] (66.66%), ciprofloxacin (7.84%), hydrochlorothiazide (17.65%), ranitidine (1.96%), captopril (41.17%), propranolol (1.96%), allopurinol (1.96%), Aspilets[®] (3.92%), simvastatin (1.96%), and cefotaxime (3.92%). In summary, special attention should be given to patients receiving drugs which could cause a decrease in renal function in order to prevent the deterioration of patient's quality of life.

Keywords: Hypertension, Nephrotoxic drugs, Kidney function, The inpatients installation DR. M. Djamil Padang

THE RELATIONSHIP OF MATERNAL LACTATING STATUS WITH POSTPARTUM AMENORRHEA IN MOTHERSWITH 2-6 MONTH OLD BABIES IN INDONESIA: A DATA ANALYSIS OF IDHS 2012

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Postpartum amenorrhea is the end period of pregnancy until the restart of menstruation which is considered as an infertile period. Postpartum amenorrhea period is an important event of women's reproductive life span. The objective of this study is to determine the relationship of maternal lactating status with postpartum amenorrhea. This study used IDHS 2012 secondary data with cross-sectional study design, with 1171 respondents. In multivariate analysis with Cox regression, maternal lactating status and non-hormonal contraception use against postpartum amenorrhea showed the PR of 2.18 (95% CI: 1.22–3.89). It showed the importance of continuing breastfeeding and use of a non-hormonal contraception after delivery as a way to made a good spacing in the postpartum period.

Keywords: Maternal lactating status, Contraception, Postpartum amenorrhea

TYPE TWO DIABETES MELLITUS IS ASSOCIATED WITH THE CALCIUM CHANNEL BLOCKER THERAPY ON THE DIABETIC HYPERTENSIVE PATIENTS OF THE DR M DJAMIL GENERAL HOSPITAL PADANG, INDONESIA

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Beta cell Langerhans is the one which need Ca^{+2} to secrete insulin. When the Ca^{+2} channel is block on this cell by drug (ex. calcium channel blocker = CCB), insulin secretion is altered. The objective of this study is to evaluate whether type 2 Diabetes Mellitus (DM) on the diabetic-hypertensive patients is associated with CCB therapy. This cross sectional retrospective study was conducted of the Dr. M Djamil General Hospital Padang Indonesia. Data of social demography, medical, drug, family history and social behavior were collected from the patient's medical records which were approved by the guided patient interview. The Chi-Square statistics analysis was used to obtain the Odds ratio and the significance was taken at $p < 0.05$. Forty out of the 65 (61.5%) diabetic-hypertensive patients had hypertension before they were diagnosed type 2DM where, 35 of them (87.5%) were treated with CCB drugs. The patients who used CCB were 5.5 times (95% CI 1.615–18.731) more often to have type 2DM. This event was occurred even though the patients are <40 years old (OR = ∞ , $p = 0.007$), non-obese (OR = 1.125 [95% CI 0.167–7.600]), without history of DM and stress (OR of 2 and 2.25 [95% CI 0.296–13.511 and 0.332–15.236]) respectively. These indicated that Type 2 diabetes is associated with the CCB therapy on the diabetic-hypertensive patient even though they are less than 40 years old, without diabetic family, smoking and stress histories.

Keywords: CCB, Hypertension, CCB associated Type two Diabetes Mellitus, Diabetic-hypertension

FLUID OVERLOAD AND DIURETICS PRESCRIBING IN CHRONIC KIDNEY DISEASE PATIENTS

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Fluid overload is a major presentation in late chronic kidney disease patients and is frequently present in mild to moderate CKD patients. Abnormal fluid status has been associated with hypertension, congestive heart failure (CHF), left ventricular hypertrophy (LVH) as well as edema (pulmonary, pedal). Diuretics are frequently prescribed to control blood pressure and symptomatic relief of fluid overload. The clinical assessment of fluid status is relatively difficult and diuretics are mostly prescribed in clinical settings on the basis of high blood pressure and physical signs of edema. Although edema can roughly estimate excess extra vascular volume but it is of limited value in assessing excess intravascular volume. Current study was conducted to assess fluid status and prescribing pattern of diuretics among CKD patients. Bioimpedance spectroscopy was used to assess fluid status followed by patient routine visit to consulting physician. Neither patients nor physicians were aware of BCM results. A total of 312 patients with moderate to severe CKD were enrolled. Overall diuretic use was observed in 144 (46%) patients. Out of 144 patients, majority (n = 81, 56%) of the patients were hypervolemic, followed by euvolemic (n = 44, 30.5%) and hypovolemic (n = 19, 13.1%) patients. Loop diuretics were predominantly prescribed in hypervolemic (79%) patients while thiazides were more frequently prescribed in hypovolemic (71%) and euvolemic (68%) patients. Our findings suggest inadequate prescribing of diuretics in hypervolemic patients while over prescribing in hypovolemic and euvolemic patients. Implementation of bioimpedance spectroscopy in routine clinical practice is therefore highly recommended.

Keywords: Bioimpedance spectroscopy, Chronic kidney disease, Diuretics, Prescribing

EVALUATION OF DETERMINANTS OF LONGER HOSPITAL STAY AMONG DENGUE PATIENTS: A RETROSPECTIVE ANALYSIS**TAUQEER HUSSAIN MALLHI^{1,*}, AMER HAYAT KHAN¹, AZMI SARRIFF¹ AND AZREEN SYAZRIL ADNAN²**¹Discipline of Clinical Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 USM, Pulau Pinang, Malaysia²Chronic Kidney Disease Resource Centre, School of Medical Sciences, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia*Corresponding author: Yusra Habib Khan,
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The incidence of dengue is rising steadily in Malaysia since the first major outbreak in 1973. Despite aggressive measures taken by the relevant authorities, Malaysia is still facing worsening dengue crisis over the past few years. Dengue imposes heavy burden to health care system in terms of cost of care. This is of particular importance in resource limited setting, especially in dengue endemic regions. Very few studies have described determinants of longer hospital stay among dengue patients. Current study was aimed to determine predictors of longer hospitalisation in patients attending tertiary care hospital. A total 468 patients with dengue infection were recruited during the period of 5 years (2009–2013). We divided all patients on the basis of length of hospital stay into 2 groups: patients staying ≤ 3 days and > 3 days. Stepwise logistic regression was used to evaluate determinants of longer hospitalisation. Out of the 468 patients, 67.1% had stay ≤ 3 days and 22.9% had > 3 days. The mean length of hospital stay was 4.2 ± 2.1 days. We noted that the factors independently associated with longer hospitalisation among dengue patients were multiple organ dysfunctions (OR: 4.8, $p < 0.001$), acute kidney injury (OR: 3.6, $p < 0.001$), DHF (OR: 2.8, $p = 0.004$), DSS (OR: 2.7, $p = 0.001$) and age > 40 years (OR: 1.8, $p = 0.014$). Conclusively, patients with severe dengue illness accompanying by involvements of several organs and old age should be given prime importance in order to avoid their longer stay in the hospital.

Keywords: Dengue, Dengue hemorrhagic fever, Dengue shock syndrome, Hospital stay, Morbidity

INCIDENCE AND PREDICTORS OF SURGICAL SITE INFECTION (SSI) AT A TERTIARY CARE HOSPITAL IN MALAYSIA**OMAID HAYAT KHAN^{1*}, AMER HAYAT KHAN¹, ANDEE DZULKERNAIN ZAKARIA², MUHAMAD NIZAM HASHIM² AND SYED AZHAR SYED SULAIMAN¹**¹Department of Clinical Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 USM, Pulau Pinang, Malaysia²Department of Surgery, School of Medical Sciences, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia*Corresponding author: Omaid Hayat Khan,
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A prospective observational study was conducted at Hospital Universiti Sains Malaysia (HUSM). All surgical patients (18–75 years) over the period of 4 months that fulfilled the study inclusion criteria were included. Each patient was under constant surveillance from

the date of admission until the date of surgery and then 30 days post-operation for the incidence of SSI as per Centre of Disease Control (CDC) guidelines. Diagnosis of SSI was done either by the primary researcher or the attending clinicians according to the CDC criteria. A total of 220 patients were included in this study and the SSI incidence was found to be 11.8%. The SSI rate in clean wounds was 4.9%, 7.9% for clean-contaminated, 37.5% for contaminated and 33.3% for dirty wounds. The lowest rate of SSI (0%) was found in Herniorrhaphy, biliary, urology, laparoscopic and other GIT procedures while the highest rate (20%) was in colon operations. Using NNIS risk index, incidence of SSI in low-risk patients was 4.0%; for medium-risk, 18.2% and high-risk patients, 33.3%. In a logistic regression model, diabetics [OR, 5.3; $p < 0.01$], post-operative length of stay [OR, 1.1; $p < 0.01$], contaminated wounds [OR, 6.6; $p < 0.01$], malnourished patients [OR, 3.9; $p < 0.02$], junior surgeons [OR, 13.1; $p < 0.01$] and duration of procedure > 60 minutes [OR, 7.2; $p < 0.01$] were independent predictors of SSI. Antibiotic administration was in the form of prolonged courses which was not in compliance with the local, national and CDC guidelines for the surgical antibiotic prophylaxis. Standard infection control policies and/or practices are required which are lacking in the current settings.

Keywords: Surgical site infection, Incidence, Predictors, Malaysia

IDENTIFICATION OF MACRO-ENVIRONMENTAL FACTORS AFFECTING UPTAKE OF ENHANCED PROFESSIONAL PRACTICE IN PRIMARY CARE

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Numerous models of enhanced professional practice have been proposed for pharmacists in primary care. As uptake of these models has been inconsistent in Australia, research was undertaken to identify those factors within pharmacists' macro-environment which have the greatest impact on their capacity to implement professional models of practice. A draft framework for pharmacists' practice was developed by identifying 65 macro-environmental structures, systems, aspects of regulation or other factors known to the researchers or identified from the literature. The factors were allocated to one of five environmental domains: Social, Technological, Economic, Environmental or Political [STEEP]. Pharmacists, infocus groups, revised the draft framework resulting in 78 individual factors. An adapted Nominal Group Technique was then utilised to link, group and prioritise the factors within each STEEP domain based upon their relevance to the implementation of professionally-focused models of practice. The three most important factors in each domain are: *Social*: the education of pharmacists, their beliefs and the capacity of the pharmacist workforce. *Technological*: current and future practice models, technology and workplace structures. *Economic*: funding of services, the viability of practice and the national prescription insurance scheme. *Environmental*: attitudes of stakeholders including consumers, health system reform and external competition. *Political*: regulation of practice, representation of the profession and policies affecting practice. Identification of the factors with the greatest bearing on the implementation of enhanced models of practice in primary care will help direct research into development of pharmacists' practice.

Keywords: Professional pharmacy practice, Primary health care, Implementation

PHARMACOMETABONOMICS ANALYSIS OF PLASMA TO IDENTIFY NOVEL BIOMARKERS OF CLOPIDOGREL HIGH ON TREATMENT PLATELETS REACTIVITY (HTPR)

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Prescribing clopidogrel antiplatelet drug is mitigated by high on treatment platelets reactivity (HTPR) which might lead to therapeutic failure. The HTPR is multifactorial of genetic and non-genetic factors. Prediction of patient's clopidogrel response will assist better personalisation of therapy. Pharmacometabonomics analysis using nuclear magnetic resonance (NMR) spectroscopy of pre-dose plasma can help to identify novel biomarkers of HTPR. We aimed to identify a metabolic fingerprint (metabotype) which is predictive of HTPR in plasma. Blood samples of 71 CAD patients planned for interventional angiographic procedure were collected prior to loading with 600 mg of clopidogrel. Clopidogrel response was measured using the VerifyNow[®] system P2Y12 testing kit, 6 hours post loading. Two HTPR cut off points were evaluated; PRU value >208 and percentage of inhibition (%Inh) <15%. Blood was centrifuged to get plasma which was mixed with phosphate buffer then analysed using NMR. Univariate logistic regression followed by partial least square discriminate analysis (PLS-DA) were done to indicate the best discriminating metabotype. The PLS-DA model of PRU >208 had specificity, sensitivity, and accuracy of 81.82%, 51.85% and 70.42%, respectively ($R^2Y = 0.0751$ and $Q^2 = 0.0563$). The PLS-DA model of %Inh <15 had specificity, sensitivity, and accuracy of 77.14%, 69.44% and 73.24%, respectively ($R^2Y = 0.188$ and $Q^2 = 0.138$). Pharmacometabonomics analysis of plasma can discriminate between HTPR and responsive patients. The HTPR cut off point of %Inh <15 had better discrimination accuracy than PRU >208. The identification of the discriminating metabolites and evaluation of using integrative pharmacometabonomics-pharmacogenetics approach are ongoing.

Keywords: Clopidogrel, Platelets function testing, VerifyNow system, Pharmacometabonomics, Nuclear magnetic resonance, Personalised therapy

COMMUNITY PHARMACIST AND PHARMACEUTICAL SERVICES FOR PATIENT CARE

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This study was undertaken to evaluate pharmaceutical care services provided in community pharmacies across the UAE using a representative sample of pharmacists. A validated questionnaire addressing different aspects of pharmaceutical care was distributed to 220 community pharmacies consenting to participate in the study. Data was analysed using SPSS 20, followed by descriptive analysis. Chi Square test identified significant differences in participants' responses. Of 220 pharmacists interviewed, only 9% had postgraduate qualifications; the remaining were B. Pharm graduates. All pharmacists ensured that the patient received medication as prescribed. Fifty five percent of pharmacists provided drug information and patient counseling services, checked for adverse drug reactions and over dosage and ensured whether medication was appropriate; 53% identified unnecessary prescription without indication and 50% identified lack of response to medication. Only 72% opined that drug information services were a part of pharmaceutical care. A service providing attitude was more among pharmacists with higher qualifications, females and those above 35 years. All participating pharmacists felt the need for advanced training in pharmaceutical care to improve their reputation as health care providers. Community pharmacists have a vital role for safe and effective pharmacotherapy viz., identifying, resolving and preventing drug-related issues. Hence, as community pharmacists stated in the study, advanced training in pharmaceutical care would help fulfill their responsibility as health care providers.

Keywords: Community pharmacist, Pharmaceutical services, Patient care

EVALUATION OF FACILITIES AND SERVICES AVAILABLE IN COMMUNITY PHARMACIES IN THE UNITED ARAB EMIRATES

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This study was taken up to evaluate the facilities available in community pharmacies across the UAE using a representative sample of pharmacists. A validated questionnaire, addressing community pharmacy facets (location, facilities and prescription handling) was distributed to 220 community pharmacies across the UAE. Data was analysed using SPSS 20, followed by descriptive analysis. Chi Square test identified significant differences among the participants' responses. Of the 220 Pharmacies that participated in the study, 166 (75.5%) worked only 1 shift while the remaining operated with 2 shifts. A hundred and eighty four pharmacies were located in an accessible area; only 25.5% had parking convenience. Seventy three percent had compounding facilities and provided drug information. In more than 95% pharmacies evaluated, there were at least 2 other pharmacies located, within the same area (500 m²). None of the pharmacies had home

delivery services; 93% had laser and bar code billing facility; 36% had patient seating area. All pharmacies handled both prescription and non-prescription drugs with 50% of the pharmacies handling between 21–30 prescriptions daily. Fifty four percent pharmacists spent 5 to 10 minutes on a prescription while 45% spent 10 to 15 minutes. Majority of the UAE pharmacies studied had the required facilities for dispensing both prescriptions as well as non-prescription medicines.

Keywords: Evaluation, Facilities, Services, Community pharmacies

VALIDATION OF MY. DRUG COMPATIBILITY CHECKER (MY.DCC) AS A TOOL TO CHECK THE COMPATIBILITY OF DRUG-DRUG AND DRUG - PARENTERAL NUTRITION IN NEONATAL INTENSIVE CARE UNIT

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Intravenous drug administration in neonatal intensive care unit (NICU) is critical because of poor venous access, polymedication, fluid restriction and low infusion rate. Since parenteral nutrition (PN) is infused intravenously, it is often considered as a vehicle for medication administration. Medications may be added to PN formulations in an effort to decrease fluid requirements, reduce the need for Y-site injections, reduce the possibility of line contamination due to manipulation and decrease labor time required for drug administration. Risk is further increased by inadequate information on the physicochemical compatibility of drugs. A developed database "My. Drug Compatibility Checker (My.DCC)" will provide the compatibility information related to drug-drug and drug-PN interaction among IV drugs commonly prescribed in NICU patients. The 29 injectable drugs had been analysed with My.DCC. The database was used to check the possible compatibility of medication combination received during patient's treatment in NICU Hospital Pulau Pinang. A total of 234 newborn met the study criteria were included in this study. Among them 19 neonates had incompatible interactions of drug-drug and drug-parenteral nutrition. Recognition of these drug-drug and drug-nutrient interactions may assist the clinicians to prevent such complications and to achieve desired therapeutics outcomes.

Keywords: IV drug, Parenteral nutrition, Compatibility, Neonates

ANTIBIOTIC SHARED DECISION-MAKING DECISION AID

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Overuse and poor knowledge of antibiotics among adolescents are the main factors that lead to antibiotic resistance. Strategies such as shared decision-making (SDM) is

recognised as an effective tool to instill knowledge, improve adherence and reduce overuse of antibiotics. This study aims to construct an antibiotic SDM decision aid for pharmacists. Data on simple infections based on established decision aids was developed. The constructed decision aid was sent for professional review to 608 pharmacists nationwide to identify appropriate information to be included. The proposed aid was then sent for validation. Validation involved the perception of pharmacists (total score 10) as well as knowledge (total score 5) and perception (total score 3) of the patients (total) on the effectiveness of the antibiotic SDM decision aid. A higher score indicated a more positive perception or knowledge. Pharmacists (N = 40) gave an average score of 8.75 ± 0.55 (out of 10) on their perception towards the decision aid. The patients scored an average 4.5 ± 0.55 (out of 5) for knowledge and 2.9 ± 0.30 (out of 3) for perception towards SDM. Among 20 patients that requested antibiotic at the pharmacy, 19 of them agreed not to take antibiotics after SDM. Among the 20 patients that came with a prescription for antibiotics, 18 out of 20 were agreed to adhere with antibiotic treatment. The antibiotic SDM decision aid constructed can be used as a tool to engage adolescents in SDM process when involving antibiotics for simple infections.

Keywords: Shared decision making, Adolescent, Antibiotic

**KNOWLEDGE GAPS AND UNAWARENESS TOWARD THE SAFETY USE OF
COSMETICS CONTAINING WHITENING AGENT AMONG FEMALE STUDENTS AND
ADMIN STAFFS AROUND AIRLANGGA UNIVERSITY, AN EMPIRICAL STUDY**

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The implementation of the laws and regulations of the cosmetic and pharmaceutical hazardous materials should be included as a part of the learning objective. It has been established that the outcome of the syllabus that the student is able to identify the problems that exist in the community. The study aim is to assess the importance of the student's assignment collected in a subject taught in the Social Pharmacy Department. As a major subject, students should complete their investigation report about the knowledge gap and unawareness among user in applying the whitening agent contained in the cosmetics was explored. They collected data using questionnaire distributed by convenient sampling to 100 respondents (female students) and admin in the Airlangga University. They found that insufficient knowledge among users about the active ingredients contained in these preparations, even though knew that the preparation was legally marketed. Most of them decided to use this preparation were due to recommendation from another user without consulting with the pharmacist or other health professional (doctor). To complete the syllabus in this course, they were required to demonstrate their ability to identify and analyse the problems that exist in the community, and be able to plan acts of anticipation. The outcomes expected in this course, the competence of learning assessment of students need to be emphasised and be made clear, thereby giving a steady provision for skills. Therefore, coaching and supervision in introducing subject concerning to the competence of the pharmacist by lecturer for students is essential since undergoing the study period.

Keywords: Community pharmacy course, Syllabus, Student's assignment

DEVELOPMENT AND VALIDATION OF HPTLC METHOD FOR SIMULTANEOUS ESTIMATION OF CIPROFLOXACIN HYDROCHLORIDE AND DEXAMETHASONE IN PHARMACEUTICAL FORMULATION

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A new, simple, precise and accurate HPTLC method for simultaneous estimation of ciprofloxacin hydrochloride and dexamethasone as bulk drug and in eye drops. Chromatographic separation was achieved on aluminum foil plates precoated with silica gel 60F254, with toluene: chloroform: methanol: ammonia 2: 7: 3: 0.2 (v/v/v/v) as mobile phase. Detection was performed densitometrically at 262 nm. The R_f of ciprofloxacin hydrochloride and dexamethasone were 0.26 and 0.46, respectively. The reliability of the method was assessed by evaluation of linearity (80–280 ng/spot for ciprofloxacin hydrochloride and 50–175 ng/spot for Dexamethasone), intra-day and inter-day precision were found to be (%RSD) 0.82%–0.94% and 0.68%–0.76% for ciprofloxacin hydrochloride and (%RSD) 1.07%–1.21% and 1.01%–1.15% for dexamethasone, accuracy (99.23% for ciprofloxacin hydrochloride and 99.55% for dexamethasone), and specificity, in accordance with ICH guidelines. The method can be used for routine simultaneous analysis of ciprofloxacin hydrochloride and Dexamethasone in pharmaceutical formulations.

Keywords: Thin layer chromatography-densitometry, Validation, Ciprofloxacin hydrochloride and dexamethasone

EFFECT OF SMOKING ON TREATMENT OUTCOMES AMONG TUBERCULOSIS PATIENTS: A COHORT ANALYSIS FROM PAKISTAN

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The aim of the current study was to determine the prevalence of smoking in TB patients, identify demographic and clinical characteristics associated with smoking, and evaluate TB treatment outcomes in the smokers. A retrospective cohort analysis of TB patients was conducted at Khyber Teaching Hospital, Peshawar, Pakistan. All patients with pulmonary and extra-pulmonary TB and those co-infected with HIV, hepatitis, or diabetes mellitus were included in the study. The patients were categorised into smokers and nonsmokers based on study objectives. Treatment outcomes were evaluated by smear testing at the end of the treatment. Of the 472 enrolled subjects, 68 (14.4%) were smokers. The

prevalence of smoking among male and female TB patients was 11.8% and 2.5%, respectively. Univariate analysis indicated that the gender, age group, and marital status of TB patients were associated with smoking. These factors were further analysed in a multivariate analysis. The results indicated that patient gender ($p = 0.05$), age 15–24 years ($p = 0.05$), and age >55 years ($p = 0.004$) were risk factors associated with smoking among TB patients. Of the 68 smokers with TB, the treatment outcomes of 54 (79.4%) patients were unsuccessful, and those of 14 (20.6%) patients were successful. The treatment outcomes of the TB patients showed a statistically significant relationship with smoking (OR 2.58, $p = 0.004$). The results indicate that smoking among TB patients greatly reduces the chances of a successful treatment outcome.

HEALTH STUDIES AND REGULATION OF NANOHEALTH PRODUCTS IN IRAN: EFFECTIVENESS AND CHALLENGES OF KNOWLEDGE TRANSLATION

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Engineered nanomaterials (ENMs) have gained considerable interests during last decade due to their excellent health activities. Despite their extensive use, the potential safety of ENMs and possible mechanisms by which they may induce adverse reactions have not received sufficient attention and no specific knowledge translations exists in a practical model to describe and quantify their toxic effects for their regulation, standardisation and clinical applications. ENMs do not undergo routine biotransformation pathways therefore their biological fate and half-life could not be determined well however they may interfere with biotransformation of pharmaceuticals which may cause drug overdosing or underdosing, with harmful and even life-threatening consequences for patients. Other parameters, such as surface/volume ratio, chemical stability, and tendency to aggregation can result in reactivity of ENMs with critical genes and proteins in target organs. Although we are not able, at present, to identify all possible toxic effects of registered Nanohealth products, we used a battery of toxicology tests using cellular and animal models as well as clinical settings to predict local and systemic effects of ENMs by focusing on their genotoxic potentials, target organ toxicities and Adverse Drug Reactions respectively. We tried in our five years efforts to provide an opportunity for clinical application of more than 50 Nanohealth products in the market of Iran by developing great toxicological models but there are still lack of knowledge translation for many classes of ENMs to provide realistic health risk assessment and management.

Keywords: Nanohealth products, Pharmacy, Regulation, Knowledge translation

PREVALENCE AND MANAGEMENT OF ANAEMIA IN END STAGE RENAL DISEASE (ESRD) HEMODIALYSIS PATIENTS IN SUDAN**OMALHASSAN AMIR^{1*}, AZMI SHERIFF¹, AMER HAYAT KHAN¹ AND MOHAMMED ABDELRAHMAN²**¹School of Pharmaceutical Science, Universiti Sains Malaysia, 11800 USM, Pulau Pinang, Malaysia²Department of Nephrology, Soba University Hospital, Khartoum, Sudan^{*}Corresponding author: Omalhassan Amir, email: omal_amir@yahoo.com

Anaemia is a severe complication and important cause of cardiovascular disease in end stage renal disease. It has been related to higher morbidity and mortality among hemodialysis patients. A prospective observational study was conducted to evaluate the prevalence of anaemia and anti-anaemic drugs patterns in maintenance hemodialysis patients. Twelve governmental hemodialysis centers were stratified. Using convenience sampling 1015 end stage renal disease, hemodialysis patients in Khartoum, Sudan was recruited from August 2012 to July 2013. Using a standardised form data was collected on the social and demographic patient factors, disease factor's comorbidities and causes of end stage renal disease, current drug therapies, and laboratory investigations. The prevalence of anemia depends on the hemoglobin level chosen to define anemia. Anaemia defined as a hemoglobin concentration less than 12.0 g/dL in women and less than 13.5 g/dL in men. All studied patients had anaemia mean Hb (7.89±1.24) g/dL. A total of 534 (52.6%) patients was included in the analysis and 194 (19.1%) transfer to other centers, 165 (16.3%) deaths, 38 (3.7%) transplant and 2 (0.2%) lost to follow-up were excluded. The frequency of anti-anaemia drugs patterns by using descriptive analysis. The erythropoiesis-stimulating agent (ESA) therapy was reported in 383 (71.7%). The combination of ESA, intravenous (I.V) irons, oral irons and vitamins reported in 236 (44.2 %), the 132 (24.7%) in I.V irons, oral irons and vitamins and 90 (16.9%) in combination of ESA, I.V Irons and Vitamins. This study demonstrates a high prevalence of anaemia among patients with suboptimal management of anaemia.

Keywords: Prevalence of anaemia, Anaemia in ESRD, Hemodialysis, Antianaemic drugs, Erythropoietin

GENDER BASED DIFFERENCES OF END STAGE RENAL DISEASE (ESRD) AMONG ANAEMIC PATIENTS**OMALHASSAN AMIR^{1*}, AZMI SARRIFF¹, AMER HAYAT KHAN¹ AND MOHAMMED ABDELRAHMAN²**¹School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 USM, Pulau Pinang, Malaysia²Department of Nephrology, Soba University Hospital, Khartoum, Sudan^{*}Corresponding author: Omalhassan Amir, email: omal_amir@yahoo.com

Anaemia is well recognised in end stage renal disease. Its prevalence varies and increase according to the race and ethnicity. A prospective observational study was conducted to evaluate the patient's factors affecting hemoglobin level. One thousand and fifteen end stage renal disease hemodialysis patients in Khartoum, Sudan was recruited from August 2012 to July 2013, in stratified 12 hemodialysis centers. Using a standardised form, social

and demographic patient factors, disease factors and anti-anemic and concomitant drugs were collected. As a result 194 (19.1%) transfer to other centres, 165 (16.3%) deaths, 38 (3.7%) transplant and 2 (0.2%) lost to follow-up were excluded. A total of 534 (52.6%) patients were included in the analysis. Comparison between male and female was done using chi-square and Fisher's exact test wherever appropriate at p -value <0.005 and CI 95%. No difference in age groups (p -value = 0.378). Significant difference in higher education was reported in (60.8%) female and (76%) male, p -value <0.001 , smoker was reported in (54%) male and (0.0%) female. The significant difference was found in hypertension as etiology of end stage renal disease (52.6%) male and (62.0%) female, p -value 0.042, gout (13.5% male and 3.5% female p -value <0.001). Post-operative complication was found in female (2.3%, p -value 0.02). Gender in Sudanese haemodialysis ESRD patients found to be significant factor for difference between patients hemoglobin level.

Keywords: Gender and anemia, Anemia in ESRD, Hemodialysis, Anti-anaemic drugs, Erythropoietin drugs, Hemoglobin level

NMR-BASED METABOLOMIC APPROACH FOR THE DISCRIMINATION OF PLASMA SAMPLES FROM RATS ADMINISTERED WITH A QUASSINOID-RICH FRACTION OF EURYCOMA LONGIFOLIA (TONGKAT ALI)

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The study evaluated the effect of Tongkat Ali quassinoid-rich (TAQR) extract on rats sperm count and the corresponding post-treatment plasma metabolic changes. Seventeen male Sprague-Dawley (SD) rats, randomly categorised into 2 groups, were orally administered for 48 days with water for the control (group 1, $n = 9$) and 21 mg/kg of TA quassinoid-rich extract (TAQR, group 2, $n = 8$). Upon completion of the 48-day treatment, the plasma samples were collected and the animals were subsequently sacrificed for sperm count analysis. The plasma samples were then analysed by NMR. Statistical analysis was performed on the data to check for any metabolic discrimination between groups and to identify the potential markers contributing to discrimination. The sperm analysis results showed that the rats in TAQR-treated group had significantly higher number of sperm compared to the control group. Orthogonal partial least squares discriminant analysis (OPLS-DA) model extracted from the Carr-Purcell-Meiboom-Gill (CPMG) spectra of samples yielded a statistical model with good quality ($R^2X = 0.91$, $R^2Y = 0.934$, $Q^2 = 0.633$) that could clearly discriminate the groups. The model indicated a clear separation among the plasma profiles with respect to sperm count level. Plasma CPMG profiles of the animals in group 1 and 2 were different in cholesterol, alanine, VLDL/LDL, lactate, benzoic acid and ethanol levels. The results proved the efficacy of quassinoids on sperm count increase in rats and provided the potential plasma markers for the discrimination between the groups.

Keywords: *Eurycoma longifolia*, Quassinoids, NMR-based metabolomics, Rat sperm count, Plasma

FACTORS ASSOCIATED ADVERSE DRUG REACTIONS DURING HAART THERAPY AMONG HIV/AIDS PATIENTS TREATED AT INFECTIOUS DISEASE CLINIC**KASHIF ULLAH KHAN¹, AMER HAYAT KHAN¹, SYED AZHAR SYED SULAIMAN¹ AND CHOW TING SOO²**¹School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 USM, Pulau Pinang, Malaysia²Infectious Disease Department, Hospital Pulau Pinang, 10450 Georgetown, Pulau Pinang, Malaysia

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Current study is aimed to explore and to observe factors associated adverse drug reactions occurrence of antiretroviral drugs among HIV/AIDS patients. An observational retrospective study of all patients diagnosed of HIV infection and on HAART therapy from Jan 2007 to Dec 2012 was conducted at infectious disease department of Hospital Pulau Pinang, Malaysia. Patient socio-demographic details along with clinical features were recorded. Data was descriptively analysed by using statistical package for social sciences (SPSS 20). Out of 792 patients that underwent HAART therapy, 607 (76.6%) were male and 185 (23.3%) were female patients. Overall 338 (42.6%) patients had experienced adverse drug reactions. A total number of 449 (56.6%) adverse drug reactions were reported among which 329 (73.1%) occurred in males and 120 (26.8%) in female patients. On binary logistic regression, the results showed that Chinese population (OR 0.69, $p = 0.01$) and Indian population (OR 1.60, $p = 0.02$) had a statistically significant relation with ADRs. Patient's age having less than 30 years (OR 0.59, $p = 0.02$), married (OR 1.45, $p = 0.009$), smoking status (OR 1.49, $p = 0.01$) and alcoholic patients (OR 1.38, $p = 0.02$) also shows a significant relation with ADRs occurrence. However on Multiple logistic regression only alcoholic patients (OR 1.44, $p = 0.05$) were found to be statistically significant with ADRs occurrence. The study indicates the incidence of adverse drug reactions is higher in Chinese and Indian population of Malaysia. Also the study indicates that ADRs are associated with the smoking and alcoholic status of the HIV/AIDS patients. However, a multicenter study with a large sample size may provide us with better understanding of this relationship.

Keywords: ADRs, Lipodystrophy, HAART, HIV/AIDS**USEFULNESS OF SERUM CYSTATIN C IN MALAYSIAN ELDERLY CKD PATIENTS WITH TYPE2 DIABETES MELLITUS AND NEPHROPATHY****IRFANULLAH KHAN^{1,2*}, AMER HAYAT KHAN², AZREEN SYAZRIL ADNAN¹, RAJA AHSAN AFTAB^{1,2} AND AMJAD KHAN^{1,2}**¹Chronic Kidney Disease Resource Center, School of Medical Sciences, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia²Department of Clinical Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 USM, Pulau Pinang, Malaysia

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Serum cystatin C is a new promising marker of renal function. The aim of the study was to analyse serum cystatin C as a marker of renal function in diabetes patients. The current study was rationalised to measure estimated GFR in elderly CKD patients by serum

Cystatin C. A prospective study in 25 elderly CKD type 2 patients was done in October 2015 at HUSM Kelantan, Malaysia. Serum Cys C and creatinine was determined by ELIZA and Jaffe Method respectively. Estimated GFR was calculated by CKD-EPI Cys C and CKD-Epi Cr formula. A validated data collection form was developed to record patient demographics and relevant clinical data. Statistical analysis was performed via SPSS version 20. In all 25 patients serum cystatin C and creatinine both were determined. Glomerular filtration rate (GFR) was estimated based on the cystatin C concentration according to the CKD-Epi Cys C formula and compared to GFR estimated based on serum creatinine concentration according to CKD-Epi Cr. They correlated strongly in patients with GFR lower than 60 mL/min/1.73 m² ($r = 0.62, p < 0.0001$). Cystatin C estimated GFR is closely related to serum Cr in determining CKD staging (3–5) among elderly CKD typ 2 patients.

Keywords: Serum cystatin C, Type 2 diabetes mellitus, Nephropathy

EFFECT OF BMI ON SERUM CYSTATIN C AMONG ELDERLY CKD TYPE 2 DIABETIC PATIENTS

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It is well known that plasma creatinine concentration is affected by muscle mass, while some studies have suggested cystatin C is affected by body mass index (BMI). The current study was rationalised to assess the effect of BMI on serum cystatin C among elderly CKD patients. Two groups of participants selected for this purpose. Control group consisted for 12 patients whereas 13 patients were selected for study group. Serum Cys C and creatinine was determined by ELIZA and Jaffe Method respectively. Patients were interviewed and necessary information was retrieved. A validated data collection form was developed to record patient demographics and relevant clinical data. Statistical analysis was performed via SPSS version 20. Cystatin C was highest in the obese group (0.77 mg/L; 95% confidence intervals [CI] 0.69–0.77) On multivariate analysis, body fat and GFR ($p 0.003$) were significant determinants of cystatin C; muscle mass and age affected creatinine significantly ($p 0.02$). Using cystatin C equation CKD-Epi showed significantly better result in the obese group. Creatinine equation showed significant overestimations of GFR for the study group. Body fat is a significant determinant of cystatin C while creatinine concentration is highly affected by muscle mass and age. Body composition plays an important role in the interpretation of renal function.

Keywords: Serum cystatin C, Type 2 diabetic patients, Elderly CKD, BMI