An analysis of medication incident reports in the elderly population in Beaumont Hospital
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Background: Medication errors are the single most preventable cause of patient harm that occurs in a medical facility. From prescription to administration, there is a vast amount of opportunity for errors to occur. This emphasizes the need to evaluate the extent of medication error in the elderly as medication errors are estimated to be the fifth most common cause of death among hospitalised elderly population. This study analysed medication incidents reported in the Elderly population in Beaumont hospital and also the trends in reporting, drug classes reported with high frequency, as well as the severity/significance of the incidents reported.

Methods: The Beaumont Hospital Medication Incident Report Database was the source of data utilised for this study [1]. The inclusion criteria are patients over 65 years old. IT access and software packages were used to analyse the trend in reporting, the drug classes reported, and the severity/significance of the incidents reported (as qualified by an objective rating scale, NCC MERP). A comparison to the criteria outlined in BEERS criteria was performed.

Results: A total of 157 medication incidents were reported. Incidents were discovered and reported mainly by nurses and pharmacist, at 57% and 34.4% respectively. Only 6% of incidents were reported by doctors. The highest number of incidents occurred in the administration stage, at 49% of cases reported. Incidents at the prescribing stage accounted for 39.5% of incidents. The remaining stages included monitoring, ordering, dispensing, and storage of medication accounted for 11.5% in total. With regards to the medications involved, they were categorised based on the BNF. The highest number of incidents was the cardiovascular system, with 39 incidents. This was followed by infectious disease, at 27 incidents, and the central nervous system, at 26 incidences. Other systems had relatively lower number of incidents. In terms of outcome of incidents, only a small number of patients came to harm, whereas majority either did not reach patients or was reversible. Regarding to Beer’s Criteria, 2 of the drugs used that recommended direct avoidance, and 4 drugs were used that recommended avoidance in certain circumstances.

Conclusions: In conclusion, the overall pattern of reporting, process stage, and drug classes involved is in line with international findings. Patients were minimally harmed by the incidents. Beer’s criteria were adhered to in general, unless special consideration required. This study reflects the reporting culture in an Irish hospital and allows issues to be addressed to decrease the rate of medication incidents.

Reference

A2
MRS2179: a novel inhibitor of platelet function
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Background: Antiplatelet agents, such as aspirin and P2Y12 inhibitors, are essential in the secondary prevention of cardiovascular disease [1]. Despite effective treatment with these drugs, many patients still suffer ischemic events. This suggests the need for additional antiplatelet therapy. The P2Y1 receptor is a seven transmembrane G protein coupled receptor responsible for platelet shape change and reversible aggregation [2]. Animal studies have shown that antagonists of the P2Y1 receptor, such as MRS2179, inhibit platelet aggregation [3]. The effect of P2Y1 inhibition in man is not yet clear. To address this we characterised platelet function in human blood using a novel shear-mediated dynamic assay.

Methods: Blood used was drawn from healthy donors free from antiplatelet medication. Light transmission aggregometry (LTA) was used to determine the optimal concentration of MRS2179. Platelet aggregation was induced by the addition of incremental concentrations of ADP. The optimal concentration of MRS2179 to inhibit ADP induced aggregation was 20µM. Thrombus formation in vivo occurs due to the tethering, adhesion and translocation of platelets to von Willebrand Factor (vWF) under arterial shear conditions [4]. To test the effect of MRS2179 under these conditions blood was perfused at an arterial shear rate of 1500-s through custom made parallel plate flow chambers coated with purified vWF. Platelets were labelled with a fluorescent dye and images were recorded at 30 frames per second. A novel software programme used distance weighting to calculate the amount of static and translocating platelets, the mean distance travelled by the platelets, the translocation velocity, the percentage of platelets moving at one time and the percentage of the surface covered in 500 frames.

Results: The results of this study demonstrate that a concentration of 20µM of MRS2179 effectively inhibits aggregation. In 13 normal donors 20µM either completely inhibited ADP induced aggregation or enhanced platelet disaggregation (p<0.05). In preliminary experiments from 3 normal donors assayed there were no significant changes in most of the parameters measured in the dynamic assay. However, platelet translocation velocity in the presence of the P2Y1 antagonist was significantly increased (p<0.05).

Conclusions: Selective inhibition of the P2Y1 surface receptor results in a significant decrease in aggregation in the presence of an agonist.
A3

Do doctors practice what they preach? The wellbeing and lifestyle habits of primary health care physicians in Bahrain

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Background: Lifestyle habits of physicians are of paramount importance for two reasons. Firstly, they influence and direct the physician’s own health. Secondly, it has been shown that these habits have implications on patients’ care. There is limited information on the lifestyle habits and wellbeing of physicians in Bahrain. Therefore, we set out lifestyle habits and the general wellbeing of practicing primary health care physicians in Bahrain.

Methods: A cross sectional study. An anonymous self-administered questionnaire assessing wellbeing and lifestyle habits was distributed to a random sample of 175 out of 320 primary health care physicians who practice in all 27 health centres around Bahrain. We performed descriptive analysis for all variables. Parametric test (t-test and ANOVA) and Pearson two-tailed test were used to test the association between variables were appropriate.

Results: One hundred fifty-two physicians agreed to participate in the study. Female physicians made up two thirds of the sample. The majority are of Bahraini nationality with a mean age of 45 (SD=10). The most prevalent known health conditions are hyperlipidaemia (25%), hypertension (20%) and diabetes (11%). Only 30% of the physicians report a 30 minute exercise in a usual week; of those, 13% exercise for 5 days or more. The majority of physicians report walking as their main exercise form. Concerning nutrition, 41% have three main meals every day. Forty seven percent of physicians consume fast-food meals during the week while a similar percentage drinks at least one carbonated beverage each day. Regarding smoking and alcohol consumption, 98% report never drinking alcohol ever, while tobacco smoking is used by 10%, with 6% of the sample smoking waterpipe. The mean sleeping time is 6 hours a day.

Conclusions: In conclusion, we document for the first time ER stress and the UPR response in ZZ-AATD neutrophils. Furthermore we demonstrate that ER stress and UPR can increase neutrophil degranulation. This shifts the paradigm of inflammation in AATD beyond lung and liver cells to include circulating immune cells.

References

A5

Can aggressive postoperative non-narcotic therapy replace narcotics in patients undergoing laparoscopic hysterectomies?

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Background: Pain, although invariably present after surgical procedures, is not always well controlled. Medications from different analgesic groups are often used to control post-operative pain. Recently, attention has turned towards the optimization of non-opioid analgesics including NSAIDS and acetaminophen. After gynaecologic laparoscopy up to 80% of patients may require opioid analgesia. However, opioids can have adverse effects including nausea, vomiting, sedation, and respiratory depression. Thus the prudent surgeon attempts to use a narcotic-sparing approach to post-operative analgesia. Theoretically, aggressive non-narcotic analgesic administration will result in less narcotic use. Fortunately, both NSAIDS and acetaminophen are very effective in the control of moderate to severe pain and have few side effects. Our research question then is: “What is the post-operative narcotic use amongst women undergoing laparoscopic hysterectomy who receive aggressive non-narcotic therapy?”

Methods: The subjects of interest were undergoing laparoscopic hysterectomy in a Canadian community hospital. Data from one calendar year was reviewed. For all patients the same routine pre-printed orders were used by the nursing staff. The order set included non-prn (non-discretionary) post-operative non-narcotic analgesics (ketorolac and acetaminophen). Narcotics were administered by the nursing staff on a prn basis for non-response/breakthrough pain after administration of the non-narcotic analgesics. Two databases, Meditech® and OR Manager® were used to
extract information. Medication administration was determined from the Meditech™ “Medications” module. Only ward administration of narcotics was included. All narcotics were converted to IV-morphine equivalents using Canadian Pharmacist Association (2008) morphine-centric equi-analgesic conversions. The data was tabulated and analyzed using Microsoft Excel.

Results: Two hundred sixteen women underwent laparoscopic hysterectomy in the year ending July 30 2013. Meperidine, morphine, codeine, tramadol, and oxycodone were the narcotics administered. Overall, only 29% of the patients received narcotics. The mean narcotic dose in those patients who received narcotics was 4.1 morphine-equivalent mg IV. Of those who received post-op narcotics 22% did so between hours 0 and 6 and 23% between hours 6 and 12. When between-surgeon comparison was performed there was marked variation in narcotic consumption by patients ranging from approximately 20% to 40%.

Conclusions: Most (71%) women in this laparoscopic hysterectomy cohort did not receive any narcotics. This is likely attributable to the aggressive use of non-narcotic analgesics. There was unexplained between-surgeon variability ranging from approximately 20% to 40%.

A6 Effects of pre- and postnatal deletion of the transcription factor Nkx2-1 on the expression of NGF, trkA, trkB and p75NTR in mice

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Background: Expression of the homeodomain-containing transcription factor Nkx2-1 is essential for the prenatal development of the forebrain, lungs and thyroid gland. Humans with only one functioning Nkx2-1-allele, a rare genetic condition known as “Nkx2-1 haploinsufficiency”, become phenotypic in early childhood. This syndrome displays a variable combination of symptoms including congenital hypothyroidism, respiratory distress syndrome and chooreoathetosis. The severity of the neurological symptoms varies between the patients but, however, little is known about the cell-types which might be affected by the mutation. Recently it was shown in mice that cholinergic and parvalbumin (PV)-containing GABAergic neurons of the subcortical basal ganglia and magnocellular nuclei of the ventral forebrain maintain Nkx2-1 synthesis throughout life. It is well-known that postnatal cholinergic basal forebrain neurons are strongly influenced by the synthesis of neurotrophins including the “nerve growth factor” (NGF). For instance, NGF is essential for the differentiation and maintenance of these cells which otherwise, in the absence of this trophic molecule, undergo shrinkage and degeneration. It is also known that cortical GABAergic neurons, which are mostly described as their target cells, synthesize this factor. In order to elucidate whether impaired synthesis of Nkx2-1 is accompanied by corresponding effects on the neurotrophin synthesis, we have investigated conditional knockout-mice with either pre- or postnatal deletion of Nkx2-1. Additionally, we investigated the effects of these two mutations on the synthesis of corresponding neurotrophin receptors (trkA, trkB, p75NTR).

Methods: Expression levels of NGF, p75NTR, trkA, trkB and two housekeeping genes (HPRT; GAPDH) were measured using quantitative real-time-PCR (qRT-PCR) in 20 mice. Five mutants (GAD6cre/+;Nkx2-1/−c, “prenatal mutation” & ChatCre/+;Nkx2-1/c, “postnatal mutation”) and five controls each (GAD6/+;Nkx2-1/−ft & Chat+/+;Nkx2-1/−ft) were used. The present study was carried out according to the institutional guidelines for animal welfare.

Results: Significantly decreased expression levels of trkA (-82%) and p75NTR (-60%) were detected in GAD6-mutants, and of trkA (-56%) in Chat-mutants. No significant changes were observed for NGF and trkB in both mutant lines and for p75NTR in ChatCre/+;Nkx2-1/c mice.

Conclusions: Our results can be summarized as follows: (1) the reduction in the number of cholinergic neurons after pre- and postnatal Nkx2-1-deletion is indeed accompanied by decreased levels of neurotrophin receptors but (2) cortical GABAergic NGF-synthesis is not impaired by the mutations. This suggests that permanent synthesis of NGF in the target regions of cholinergic basal forebrain neurons does not compensate for the effects of Nkx2-1 targeting.

A7 A 3D environment influences osteocyte function

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BMC Proceedings 2015, 9(Suppl 1):A7

Background: Osteocytes are critical in bone maintenance, adaptation and have important endocrine functions including mineral homeostasis through osteocyte-specific factors such as fibroblast growth factor 23 (fgf-23), a regulator of serum phosphate. MLO-Y4 cells are an osteocyte—like cell line that expresses negligible levels of fgf23. To date, no study has yet investigated the effect of a 3-dimensional culture system upon MLO-Y4 cells. The overall study objective was therefore to examine the effects of 3D culture upon MLO-Y4 expression of fgf23 using a collagen-glycosaminoglycan (GAG) 3D scaffold. In addition the effect of mechanical cues, scaffold stiffness and fluid flow shear stress, in directing cell behaviour was also studied.

Methods: MLO-Y4 cells were cultured upon 3D collagen-GAG scaffolds. Mechanical stimuli effects were applied by varying the scaffold substrate stiffness and using a perfusion bioreactor to apply fluid flow shear stress. Scaffolds were separated into static culture groups or flow group. Real-time PCR was used to determine Cox2 and Fgf-23 expression. The mechanosensitive gene Cox2 was used to validate the applied mechanical cues experienced by the osteocytes.

Results: Results indicate that MLO-Y4 cells were found to express fgf23 when cultured on a 3D scaffold compared to a 2D control with gene expression significantly raised with increasing scaffold stiffness. The addition of fluid flow resulted in higher gene expression compared to statically cultured controls. Results were validated by increased expression of Cox-2 with increasing scaffold stiffness and fluid flow.

Conclusions: This is the first study to show 3D collagen-GAG scaffolds, can direct osteocyte function. Increasing substrate stiffness augmented expression of the aforementioned genes. Flow stimulation further enhanced gene expression. In conclusion, we have demonstrated that 3D culture can influence osteocyte biology, promoting the expression of fgf23. We have also shown that both substrate stiffness and fluid flow can significantly influence osteocyte gene expression, demonstrating that fgf23 is a mechanically regulated protein. This data further highlights the importance of mechanical cues in directing cell behaviour, the finding that fgf23 is mechanically regulated has important implications regarding a mechanically regulated endocrine axis.

A8 Radio-frequency ablation vs. open surgery in the treatment of varicose veins - a comparative study

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Background: Varicose veins are common and often debilitating. Radio-frequency ablation (RFA) has emerged as a minimally invasive alternative to traditional open venous ligation surgery. It has been shown to reduce peri-operative morbidity and improve quality of life scores. Aim: The aim of this study was to directly compare RFA and open sapheno-femoral ligation.

Methods: This was a single centre retrospective cohort study. All patients with confirmed sapheno-femoral junctional incompetence who underwent surgical management treatment between January 2011 and December 2012 were included. Medical charts and computer records were reviewed. Radiological success, choice of anaesthesia and hospital length of stay was documented. Procedural cost was also calculated. A focused cohort analysis was undertaken to compare the initial 50 RFA procedures
performed with the last 50. This allowed for departmental learning curve assessment over a 13-month period.

**Results:** During the study period 298 patients underwent surgical intervention. A total of 204 patients underwent RFA. Sixty-six percent of all patients were female. RFA was associated with a reduction in the requirement for general anesthesia (41% v 100%, P=0.000), overnight hospital stay (22% v 82%, P=0.000) and pre-operative blood tests (5% v 38%, P=0.000) when compared with open ligation. The overall success rate for RFA was 98%. No significant inter-group difference was noted for 30-day readmission (P=0.203). The cost of open surgery was significantly less than RFA (€696 v. €734, P=0.000). Subgroup analysis with regard RFA identified a reduction in cost (€1024 v. €87), P=0.003) as well as hospital overnight stays (10% v 36%) with an increase in the use of intravenous sedation as opposed to general anaesthetic (16% v 60%) over a 13-month period.

**Conclusion:** RFA is a viable alternative to open repair, requiring less invasive anaesthesia, fewer laboratory tests and reducing hospital length of stay. However, it is associated with a higher financial cost.

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**A9**

**The effect of repetitive transcranial magnetic stimulation on dorsolateral prefrontal glutamate in youth with treatment-resistant depression**

**Background:** Major Depressive Disorder (MDD) is a debilitating psychiatric disorder characterized by feelings of low self-worth, loss of interest and suicidal thoughts. An estimated 350 million people are affected worldwide, 15% being adolescents. Repetitive transcranial magnetic stimulation (rTMS) is a non-invasive intervention that modulates cortical excitability by inducing electric currents in neurons by administering pulsating magnetic fields to the scalp. Studies have shown the left dorsolateral prefrontal cortex (DLPFC) to be implicated in positive effects on emotion, and glutamate/Glx levels to be decreased in MDD patients. In adults, rTMS has been shown to significantly improve mood, decrease Hamilton Depression Scores and increase glutamate, glutamine and choline levels in the DLPFC. We hypothesize an increase in DLPC glutamate levels following treatment.

**Methods:** Eleven treatment-resistant MDD patients (4 females and 7 males, ages 15-21) were recruited and clinically assessed using the Hamilton Depression/Anxiety Rating Scale and the Children’s Depression Rating Scale at baseline, and during each week of treatment for three weeks. Participants also underwent baseline and post-treatment MRI scans. Magnetic resonance spectroscopy was used to measure glutamate levels and data was analysed using the LC model method. TMS treatments were performed daily for three weeks and treatment response was defined as ≥50% decrease in baseline Ham-D rating scale.

**Results:** In general, rTMS treatments were well tolerated, however some patients described minor side effects of mild headaches and scalp discomfort. Seven patients were treatment responders who showed symptom improvement, a 62% decrease in Ham-D scores from 25.43 (±7.65) to 9.57 (±1.51) and a 30% decrease in CDRS scores from 74.43 (±11.04) to 52.14 (±8.99). Ham-A scores decreased 78% from 23.86 (±6.5) to 5.29 (±3.55). In the left DLPCF, treatment responder glutamine levels increased by 5% and Glx levels increased by 10% in the DLPCF. Responders also showed lower baseline glutamate levels at 8.73 (±1.21) mmol/kg-wet-weight, which increased by 12% to 9.77 (±1.18) following treatment. Interestingly, non-responders had higher baseline glutamate levels at 11.87 (±6.47) and levels decreased by 9% to 10.75 (±3.13).

**Conclusions:** These findings are consistent with previous literature. Evidence of increases in excitatory neurotransmitter levels in the DLPCF and alleviation of symptoms following treatment indicate that rTMS exerts anti-depressant effects and can be pursued as a safe and effective therapy for adolescent MDD.
The sample size needed for a 95% confidence interval of +/- 2 is 306. Patients in these centers are divided into three time-shifts. First batch (A) starts from 7AM – 11AM, the second (B) from 1PM – 5PM and the third (C) from 6PM – 10PM. Patients’ age, sex, timing of dialysis, Calcium, Phosphorus, Urea, Creatinine, Bicarbonate, Parathyroid hormone, Hemoglobin, Albumin, Alkaline phosphatase (ALP), Diabetes Mellitus status and BP control were obtained from the patient’s files and the Ministry of Health RFW system. Formal statistical analysis using SPSS was applied with a statistical significance set at a p-value of <0.05.

Results: A total of 329 patients were included, group A had 106 patients, group B had 135 whereas group C had 88 patients. Males made up 51.4% of the total sample while females constituted 48.6%. Out of all serum biochemistry parameters, five were found to be statistically significant variance between the three groups. Average serum Urea, Creatinine and ALP were found to be lowest in group C measuring at (18.7,95% CI 16.9-20.4), P-value 0.04), (672.5,95% CI 612.2-732.7), P-value 0.001) and (132.4,95% CI 118.3-146.5), P-value 0.032 respectively. While average Albumin & HCO3 were highest in group A measuring at (33.1,95% CI 32.3-33.9), P-value 0.002) and (18.2,95% CI 17.5-18.8), P-value 0.01) respectively. BP control did not achieve statistically significant difference among the three groups but when compared between AM hours (7-11AM) and PM hours (1-10PM), results showed better control in AM shift attenders (53.8%, P-value 0.18).

Conclusions: Late attenders had a better serum Urea, Creatinine & ALP levels while early attenders had better HCO3 & Albumin. However, BP control showed no statistical significance in the original setting of the study. Physicians can apply these results in their practice by placing patients to the appropriate time-shifts as suggested by their blood studies.

A12 An investigation of IL-8 degradation in response to PA401 compared to hypertonic saline in bronchoalveolar lavage fluid of Cystic Fibrosis patients

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Background: The lung pathogenesis of cystic fibrosis (CF) involves inflammation, airflow obstruction and an increased incidence of pulmonary infections. Increased levels of proinflammatory cytokines and chemokines such as interleukin-8 (IL-8) play a pivotal role in sustaining the cycle of inflammation in the CF lung. Glycosaminoglycans (GAGs) possess the ability to bind IL-8 providing protection from proteolytic degradation and inflammation in the CF lung. Glycosaminoglycans (GAGs) possess the ability to bind IL-8 providing protection from proteolytic degradation and inflammation in the CF lung. Exposure of pooled CF BAL to increasing concentrations of PA401 lead to a significant decrease in the level of detectable IL-8 (p<0.05) and neutrophil chemotactic efficiency (30 %, p<0.05). Significantly reduced levels of IL-8 (p<0.05) were detected following incubation with PA401 for 4 hr in 6/7 individuals with CF when compared to a PBS control. The level of IL-8 present in BAL following incubation with PA401 was significantly reduced compared to HTS (p<0.05) in 2/3 CF patients. Western Blot analysis indicated that serum proteases (inhibited by alpha-1 antitrypsin, PMSF and peflagloc) play a major role in degrading PA401.

A13 The Effectiveness of transperineal template guided mapping biopsy compared to transrectal ultrasound guided biopsy in detecting prostate cancer

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Background: To assess the effectiveness of transperineal template guided mapping biopsy (TTMB) in detecting prostate cancer in patients with previous multiple negative transrectal ultrasound guided (TRUS) biopsies of the prostate.

Methods: From April 2011 to February 2013 22 patients who had previously undergone 2 or more TRUS biopsy with a continuing rising PSA were biopsied using an anatomically guided template. Clinical parameters included age, initial PSA, PSA pre TTMB biopsy and number of previous biopsies. Number of cores sampled, number of cores positive for cancer and Gleason score were assessed. Results: Average age is 61.45 years with average of 2.5 previous biopsies and pre biopsy PSA of 15.5. On average 22.3 cores were sampled in each patient. PSA rose 6.4 ng/ml between initial biopsy and PSA triggering TTMB. Average elapsed time from initial biopsy to TTMB was 3.3 years. Overall 31.8% of patients (n=7) were diagnosed with prostate cancer at TTMB. There were 4 patients found to have Gleason 3+3=6, 1 Gleason 3+4=7 and 4 Gleason 4+4=8.

Conclusions: TRUS biopsy is known to miss clinically significant pathology of the prostate. In this single surgeon single institution analysis we examined the efficacy of the TTMB in identifying prostate cancer in patients with multiple previous negative biopsies and a rising PSA, and found over 30% of patients with previous multiple negative biopsies to have clinically significant prostate cancer. This study demonstrates that in the right hands TTMB can be an integral step in the management pathway of patients with suspected prostate cancer.

A14 Irish GP referral rates and influencing factors

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Background: General practitioners (GPs) play a key role as the gatekeepers of access to secondary care in Ireland, and indeed in many healthcare systems worldwide [1]. This role has been shown to be crucial in providing cost-effective healthcare delivery. Our study aimed to analyse the GP referral process and the factors by which referral rates may be influenced, particularly those that are unique to the Irish healthcare system.

Methods: Eighty GPs of the County Sligo General Practitioners’ Society participated between July 2011 and November 2011. For 100 consecutive patient consultation each GP record; patient age, gender, GMS status, and whether or not the patient was referred. In the case of a referral, the GP was asked to specify to what specialty they were referred. Statistical analysis was conducted using PASW Statistics 20.0.

Results: Of the 7993 consultations, 936 (11.7%) patients were referred to secondary care. There was a wide spectrum of GP referral rates, ranging from 1% to 26%, with a mean average GP referral rate of 11.7% +/- 7.2%. The emergency department received the greatest proportion of GP referrals (25%). GMS eligibility was found to be associated with referral
rates, with 9.7% of GMS eligible patients referred to secondary care compared to 13.3% of GMS ineligible patients, OR 1.67 (95% CI 1.45-1.92). GP gender was also associated with referral rates, with female GPs having a referral rate of 13.2% +/- 6.1 compared to male GPs at 10.4% +/- 6.5 (p = 0.016).

Conclusions: Our study demonstrates a wide range of GP referral rates. Rather than attempting to standardise referral rates, studies suggest we should strive to reduce inappropriate referral rates [2]. As a result, future studies should aim to measure both the appropriateness of referrals as well as the outcomes of the referral. Although studies of this sort have been conducted in the UK, they have yet to be reproduced in Ireland.

References

A15
Elucidating the role of stress signalling in ALS
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Background: ALS is a fatal, rapidly progressive neurodegenerative disorder affecting motor neurons in the CNS; this results in muscle weakness which progresses to paralysis and death from respiratory failure. There is currently no effective cure as its pathophysiology is poorly understood; however, aggregates comprising misfolded proteins are known to be characteristic of the disease. These protein aggregations could elicit ER stress and subsequently the unfolded protein response (UPR). Initially, this response is cytoprotective as it inhibits protein synthesis thereby preventing further protein accumulation until the stress resolves, however if prolonged it can stimulate apoptosis. This study attempts to clarify the role of ER stress and the UPR in ALS.

Methods: Immunofluorescence was performed on SOD1 mice spinal cord sections at two time points, PND90 and endstage, which were compared to wild type controls. Antibodies were used against ER stress markers ATF6, CHOP, PERK, IRE1 and p-eif2a with SMI32, NeuN or GFAP used as co-stains for distinguishing the cell type and signal co-localization. Immunofluorescence was then optimized to eliminate autofluorescence and antigen masking in the FFPE human tissue. Human spinal cord samples from 5 patients with ALS and 5 controls were then analysed by Nissl staining to assess the histology and with the ATF6 antibody to assess levels of ER stress.

Results: P-eif2a, nuclear ATF6, CHOP and PERK levels were elevated in the endstage transgenic mice compared to the PND90 and wild type samples. The p-eif2a co-localised with the NeuN neuron stain. Further results from the human tissue immunofluorescence are pending.

Conclusions: ER stress was shown to be increased in the SOD1 mouse model compared to controls; these mice are a model for ALS as 20% familial ALS cases carry the same mutation. Co-localisation of the NeuN with the p-eif2a implies a neuronal location of the stress. This indicates the UPR’s involvement in the pathophysiology of ALS and suggests it may be a delayed response or a consequence of the disease as markers were exceedingly elevated in the endstage compared to the day 90 mouse spinal cords. The ER stress pathway could potentially be a novel therapeutic target in ALS with many emerging drugs modifying the UPR and if identified to be raised in other more accessible tissue in ALS patients it could potentially be used as a biomarker for early disease diagnosis.

A16
Practice of the principle of right conduct in obtaining informed consents and legibility of the consent forms - a clinical audit
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BMC Proceedings 2015, 9(Suppl 1):A16

Background: Informed consent forms must be clear and include all the necessary information of the possible risks, benefits and complications of the procedure needing consent to. Thus, the form should not include illegible handwriting, medical jargons and abbreviations. Ethically, it should be obtained by a higher ranked physician [1]. In a thirteen-week audit conducted in a Dublin hospital, we observed the effects of revised informed consent forms by quantifying the number of errors, if any, created through this process and propose an immediate solution to it.

Methods: Retrospective (between 1/11/2012-10/2/2013) and randomised data collection method was applied on 100 informed consent forms found in patient’s files, using a data collection form consisting of 7 questions.

Results: Out of 100 consent forms, only 32% are new, contain no abbreviations and are written legibly. One form was not filled up, but the procedure associated with it (blood transfusion) was carried out nevertheless. 38% of informed consent was obtained by interns. Similarly, 10 out of 38 consent forms filled up by interns pertain to major procedures in which patients were prescribed a general anaesthesia, which rendered them unconscious. 48% of consent forms contain abbreviations while 77% were legibly written. In 7 cases, the doctors’ names were illegibly written while in 22 cases, the rank of the doctor who obtained the consent could not be identified.

Conclusions: Our study discovered a low percentage of perfectly filled informed consent forms and high percentage of legible forms. High numbers of consent were obtained by the interns, a practice which did not adhere to the recommended ethical guidelines[1]. We recommend the use of high quality rubber stamps to allow for better readability of the doctors’ name and the introduction of policy that holds the consultants responsible in ensuring the legibility of informed consent forms of their respective patients.

Reference

A17
Analysis of composite endpoints in gene expression studies in oncology
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Background: Event-free survival (EFS) endpoints are composite endpoints frequently used in cancer gene expression studies to evaluate the effects of gene expression on patient outcomes. Event free Survival endpoints in oncology, such as Overall survival, typically combine both cancer-specific ‘death from cancer’ and non-cancer specific events ‘death from other causes’. Reporting analysis on each event comprising the composite endpoint is necessary to draw more specific inferences regarding outcomes, especially in the presence of competing risks. The extent to which cancer-specific and non-specific events are separated in contemporary gene expression studies in oncology is unknown.

Methods: We identified 259 gene expression studies published between June 2007 and January 2012, with analysis of at least one EFS endpoint. We excluded meta-analyses (n=14), studies in recurrent/metastatic disease (n=22), studies without EFS endpoints and studies that censored competing events (n=39), studies in foreign languages (n=4), retracted, irrelevant to research topic or unavailable online (n=22). The remaining 158 studies were independently evaluated by two reviewers according to the extent of reporting on each of the events comprising the EFS endpoint.

Results: Sixteen studies could not be categorized because endpoints such as EFS were undefined or ambiguously defined. Of the remaining 142 studies, fifteen (10.6%; 95% confidence interval (CI), 5.4-16.2%) reported effects on both cancer and non-cancer events comprising the EFS endpoint. None of these reported any statistical analysis. Forty-Two studies (29.6%; 95% CI, 21.1-35.9%) reported only the effect on the cancer-specific component of endpoints, but not its complement, with statistical analysis provided in 18 (12.7%; 95% CI, 6.6-19.3%). In eighty-five
studies (59%; 95% CI, 50.4-69.3%) (methodology not described), with no effects on cancer-specific components of the EFS endpoints were given.  

Conclusions: The majority of gene expression studies do not report cancer-specific effects comprising the Event Free Survival endpoints. Increased specificity is required in the design and reporting of cancer gene expression studies.

Identification of a novel familial FGF16 mutation in two cases of MF4
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BMC Proceedings 2015, 9(Suppl 1):A19

Background: Mucocutaneous 4-5 finger fusion (MF4) is a rare congenital hand malformation characterised primarily by ulnar deviation of the fifth finger, clinodactyly, shortening of the fifth metacarpal and reduced mobility of the fifth finger. A small number of familial cases have been described in the literature, consistent with X-linked recessive inheritance. In May 2013 causative mutations in the FGF16 gene were identified in two unrelated patients with MF4.1 This prompted the sequencing of FGF16 in half-brothers with MF4, with a view to identifying a possibly causative mutation.

Methods: DNA samples from the phenotypically unaffected mother and her two affected sons were amplified using PCR and then underwent dye terminator chemistry based Sanger sequencing of the FGF16 gene, using primers for all three of its exons and their flanking intronic regions.

Results: In all three individuals sequenced, a novel frameshifting 19 base pair insertion (c.275_293ins19) was identified in exon 2 of FGF16, for which the mother was heterozygous, and both her affected sons were hemizygous. This mutation is predicted to lead to the introduction of a premature stop codon and therefore a loss of function of the affected allele. The predicted protein sequence change is p.(Ser98Argfs*28).

Conclusions: In the context of the identification of mutations in FGF16 in other MF4 patients, [1] there is strong evidence that the duplication in exon 2 of FGF16 identified in this family is causative for the diagnosis of MF4 in these two males. The mother is heterozygous for a mutation in this gene, and consistent with reports of other female carriers is unaffected. Additionally, identification of Fgf16 expression in interdigital spaces in a mouse embryo indicates its involvement in hand patterning, again suggesting that this mutation is significant.

Competitiveness-enhancing pathogen virulence gene expression and associated inducing molecules in human urine

A21

BMC Proceedings 2015, 9(Suppl 1):A21

Background: The abundance of ethanolamine (EA) and 1,2-propanediol (PD) within the mammalian intestine has recently been hypothesized to provide certain pathogenic bacteria with a niche-specific carbon/nitrogen source and provide a signal to enteric pathogens of their arrival in the small intestine. PD and EA metabolism may enhance competitive advantage for pathogen growth in other body compartments where these compounds are present. Pathogens such as Salmonella, Escherichia coli and Klebsiella utilise ethanolamine, while propanediol usage occurs in Yersinia, Klebsiella, Salmonella and Clostridium [2,3]. These pathogens possess the pdu and/or eut operon(s), which encode the necessary metabolic machinery to utilise PD/EA in addition to a number of virulence genes that may be induced by pdu/ eut regulatory genes. In a preliminary study, we detected PD and EA in human urine, demonstrated that urinary pathogens can metabolise these molecules in vitro and observed growth of bacteria possessing pdu/ eut operons in human urine.

Methods: Over a 10-month period 70 urine samples were obtained from the Bacteriology laboratory at Cork University Hospital, half of which were from patients with coliform-type urinary tract infections. Gas chromatography and liquid chromatography mass spectrometry methods were used to quantify PD and EA respectively in a cohort of 20 urine samples. Chromogenic media (PD-enriched MacConkey agar) was utilised to demonstrate bacterial PD metabolism in bacteriuric samples. Using a Escherichia coli ECOR library and K. pneumoniae strain (NCIMB 132128), 18-hour kinetic growth studies of known pdu/eut positive bacteria in human urine were performed.

Results: Growth studies revealed that eut/pdu positive bacteria grew well within human urine samples whether or not urine was supplemented with PD and EA. PD was determined to be present in all tested urine samples (n=19, 10 infected, 9 non-infected) in varying concentrations (trace to 8.8mM), while EA was present in much smaller quantities (trace to 0.13mM). PD metabolism was demonstrated in two putative Klebsiella spp. bacteriuric isolates (n=15).

Conclusions: EA and PD are detectable and present within human urine PD is present in larger amounts. PD utilisation is known to occur in a minority of urinary pathogens. Quantitative gene expression studies will be used to seek pdu/eut operon expression from urinary isolates.

References
A22
A retrospective audit of fluid management in patients in an acute hospital and adherence to the GIFTASUP 2009 guidelines
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BMC Proceedings 2015, 9(Suppl 1):A22

Background: Our audit entails the intravenous fluids prescribed to postoperative patients by clinicians, predominantly the hospital-based interns, where they are analysed and compared with the GIFTASUP 2009 guidelines on prescribing. We gathered data on the attitudes and competency levels in prescribing of the interns, by directly surveying the intern population with questionnaires. We then outlined areas where IV fluid prescription is inconsistent with GIFTASUP and tried to address these inconsistencies with awareness and teaching sessions targeted at those most responsible for prescribing postoperative IV fluids. We then re-evaluated the prescription of IV fluids and measured change in prescription habits. Our audit did not measure morbidity and mortality associated with improper fluid prescription, rather the prescribing habits of clinicians.

Methods: Data from 93 patient charts was collected and recorded in two phases, 50 patient charts before and 43 patient charts after an intern teaching session. Prior to the teaching session a questionnaire was handed out to 30 interns. The data was then analysed to see the level adherence patterns to the GIFTASUP guidelines across various surgical wards in Beaumont Hospital.

Results: During the first evaluation only 14% of the patient charts were identified as correctly following the GIFTASUP guidelines, this increased to 30% during the second evaluation. Furthermore, based on our questionnaire 10% of interns were identified as not confident in their IV fluid prescribing skills. Additionally, 1 in 3 interns have not been taught about prescribing IV fluids in medical school, while only 20% of the interns who completed the questionnaire have been taught about prescribing IV fluids during their internship.

Conclusions: Beaumont Hospital currently has no IV fluid guidelines set in place. This leaves many clinicians, especially interns with little access to the proper protocols in prescribing IV fluids. Further emphasis needs to be placed on the proper education and training of clinicians at the undergraduate and intern level.

A23
The relationship of adiposity to disease severity in a Crohn’s patient cohort
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BMC Proceedings 2013, 9(Suppl 1):A23

Background: Crohn’s Disease (CD) is a chronic inflammatory bowel disease characterised by recurrent intestinal inflammation [1]. Adipose tissue has metabolic and immune functions regulated through the expression of hormones and cytokines [2,3]. Conventionally, adiposity in CD is believed to reflect disease activity, nutritional status and possibly corticosteroids. Emerging data suggests that adipose tissue may play a more complex immunoregulatory role in CD [4].

Methods: CD patients attending the gastroenterology department were recruited over a 4 week period were invited to partake in this pilot study. The following data was collected: Extent of disease and previous treatments, current disease activity and biometric measurements of adiposity (Body mass index (BMI), waist hip ratio, mid upper arm circumference, skin fold thickness and percentage body fat using biometric impedance analysis (BIA)).

Results: 27 patients were recruited in this pilot study. 16 (59%) had BMI >25 and (classified as overweight or obese), 10 had normal BMI and 1 had BMI <18. 32% had body fat stores above normal, 44% within normal range and 24% had low fat stores as measured with BIA. Numbers were too small in this pilot study to establish a relationship between disease pattern and/or activity, those requiring >1 course of steroids in the previous year and those on anti-TNF therapy were more likely to have normal range BMI than the group as a whole. Self reported abdominal pain and decreased well being was highest in patients with an increased BMI.

Conclusions: Obesity rates in the general population are rising [5]. Our study indicates that obesity does present in the CD population. Adipose tissue may be a source of proinflammatory cytokines thus altering the natural history of CD in these patients [6]. Even if there is no impact on disease progression, our findings have important implications for current CD drug and nutritional management.

References
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A24
How effective is a SMS reminder service at reducing the rate of patients who do not attend (DNA) GP appointments and can DNA rates be further reduced?
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Background: Partington Family Practice is based in one of the most socio-economically deprived areas in Greater Manchester. The practice installed an SMS appointment reminder system in 2009 to decrease the DNA rates of its high proportion of service resistant patients. The aims of this project are to investigate how effective this service has been and consider any future services that could further reduce the practice’s DNA rates.

Methods: A retrospective audit was conducted on records of patients, who booked appointments with a single full time GP at the practice, to determine the percentage who did not attend appointments before and after the introduction of the SMS reminder system. Average annual DNA rates were compared from 2005 to 2013. DNA data for 2008 - 2009 were compared with data for 2012 - 2013 to see if there were any variations in behaviour of patients of different age groups and gender. The uptake of the SMS reminder system and the quality of the patient records were also analysed to ensure the system was being assessed fairly. A mobile telephone survey of 78 patients from different age categories was conducted to obtain their views on the current SMS reminder service and future services that could be implemented to further reduce DNA rates.

Results: There was a 3% decline in DNA rates in 2010, which reduced to only 1% in 2013. DNA rates have decreased dramatically for 0 to 15 and 30 to 39 year olds but have increased for 16 to 29 year olds, and 70 and older since the introduction of the SMS reminder system. Average annual DNA rates were compared from 2005 to 2013. DNA data for 2008 - 2009 were compared with data for 2012 - 2013 to see if there were any variations in behaviour of patients of different age groups and gender. The uptake of the SMS reminder system and the quality of the patient records were also analysed to ensure the system was being assessed fairly. A mobile telephone survey of 78 patients from different age categories was conducted to obtain their views on the current SMS reminder service and future services that could be implemented to further reduce DNA rates.

Conclusions: The service was more effective for those aged 40 to 70 than younger patients aged 16 - 29. It would be more effective if it was implemented more widely by introducing a well-advertised ‘opt-out’ service and by maintaining more accurate patient mobile phone records, especially for patients aged 40 or younger. The practice should consider implementing a service to cancel appointments by SMS message, which may further reduce DNA rates, especially for patients aged 16 to 29.
A25
A systematic review of clinical prediction rules to aid treatment selection in musculoskeletal physiotherapy practice

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Background: CPRs assist clinicians in making a diagnosis, prognosis or matching patients to optimal intervention based on a set of predictor variables that have been documented from a patient’s history, physical examination and in some situations available diagnostic tests. Within the field of musculoskeletal physiotherapy, a number of CPRs have been derived to target the most effective interventions for a given condition (Stanton 2010, [1]). The aim of this systematic review is to identify and critically appraise the CPRs in the area of musculoskeletal physiotherapy practice.

Methods: A systematic literature search was conducted up to July 2013 and included PubMed, EBSCO and EMBASE. Citation tracking and hand searching of relevant journals were used as supplemental search strategies. Two review authors independently screened titles, key words and abstracts of the references identified and excluded irrelevant studies. CPRs at any stage of their development (derivation, validation or impact analysis), consisting of >1 criterion, that were based on treatment selection for musculoskeletal conditions were included. CPRs were assessed for methodological quality using the McGinn criteria (2000) [2].

Results: The literature search yielded 1347 articles after duplicates were removed. A total of 108 articles were retrieved and screened, of which 33 were included in the final review. Twenty studies were at the derivation stage of development. Eleven studies underwent narrow validation and only two studies had undergone impact analysis. In terms of the clinical domains, 14 CPRs focused on low back pain, seven focused on neck pain, 4 on patellofemoral pain, 4 on rheumatological conditions, two on ankle injuries, one on lateral epicondylitis and one on headache. The methodological quality of the studies varied, particularly with respect to study design and blinding of the assessors to the presence of the criteria contained in the CPRs.

Conclusions: This review demonstrates that a number of CPRs have been derived for use in musculoskeletal practice, yet several of these have not been validated. Broad validation of these rules is required before consideration for use in clinical practice.

References

A26
Smart-phone and medical app use amongst Irish medical students: a survey of use and attitudes

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BMC Proceedings 2015, 9(Suppl 1):A26

Background: Studies in the UK and Canada reveal high smart-phone ownership rates with the majority of students viewing these devices as very useful with regards to their clinical education. Worriedingly, low awareness basic privacy and security measures appears common amongst medical students. In Ireland, little is known regarding smart-phone app ownership and use. This study sampled Irish undergraduate medical students at a single site.

Methods: A 31-item questionnaire was developed by the primary researcher following a preliminary literature review and subsequently underwent peer review. The questionnaire was distributed by means of a paper survey. Non-probability convenience sampling was conducted at educational sessions at a single site to students of all years of a medical undergraduate curriculum as per ethics approval. Collected data was analysed using SPSS Statistics 20. The internal consistency of the questionnaire as measured by Cronbach’s alpha was high (α=0.951).

Results: The survey response rate was 34.8% (317/909) with 80.8% (256/317) of respondents owning a smart-phone. A greater percentage of preclinical students, 83.4% (151/181) owned smart-phones as compared to older students, of which 77.3% owned such a device (105/2). More clinical students (78.1%) used medical apps as compared to preclinical students (57%). The two most popular brands were Apple and Samsung devices. Of those who owned a smart-phone, 65.6% (168/256) reported using medically-related apps. Students used apps predominately to aid their study. While 69.9% (179/256) of respondents trusted the information provided by the medical apps they used, only 42.2% (108/256) verified whether app content was correct. In relation to other learning methods, 38.3% (98/256) said they would prefer to use an app instead of a textbook, 23% (59/256) as compared to a lecture, although 50.8% (130/256) would prefer an app to other online information.

Conclusions: High rates of smart-phone ownership and medical app use exist amongst Irish medical students. While the majority of students trust the apps they use, only 42% verified whether the content of the apps they used was correct. Students require greater guidance when using apps as part of their learning. Universities should educate students regarding such use and provide them with recommendations and guidelines of app use as approved by faculty following a peer review process.

A27
Lupus Erythematosus and smoking: the impact on clinical presentation and therapeutic response

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BMC Proceedings 2015, 9(Suppl 1):A27

Background: The etiology of lupus erythematosus (LE) is not elucidated, but the impact of non-genetic factors is unquestionable. Smoking as a life style is often linked to development of autoimmune diseases, such as LE. Furthermore, it is generally considered that smokers have higher disease activity compared to nonsmokers and ex-smokers, as well as poorer response to standard therapy. Main aims of our study were to determine differences in disease activity and therapeutic response between smokers and nonsmokers in a group of patients with cutaneous and systemic lupus, as well as to compare smoking prevalence among our patients and general population.

Methods: The study was conducted among 65 patients (14 male, 51 female) in the database of Clinic for Dermatovenereology, Clinical Centre of Serbia (42 with cutaneous LE, 23 with systemic LE). Smoking status data was obtained by telephone survey. We analyzed the following criteria: smoking prevalence among patients compared to general population, pack-years parameter and the disease activity indices - SLEDAI-2K, ACR/SLICC, CLASI and rCLASI. We also analyzed patients’ status on the follow-up visit, defined as ‘improvement’, ‘deterioration’ or ‘without significant change’. As for statistical methods we used the independent samples t-test in order to determine difference between these parameters among smokers and nonsmokers.

Results: Smoking was by far more common among our patients (74%) than in general population of Serbia (27%) [6]. All activity and damage parameters were higher among smokers; for rCLASI A parameter the difference was statistically significant (p<0.05). Furthermore, patients with higher pack-years parameter also showed higher SLEDAI-2K score. Finally, smokers had poorer therapeutic response compared to nonsmokers on the follow-up visit (50% of non-smokers showed improvement, compared to 38% of smokers).

Conclusions: Our results are in accordance with the hypothesis that smoking may have an unfavorable impact on development, activity and treatment of lupus.
A28
A neuromuscular respiratory outpatient clinic: Patient profile and experience (Beaumont Hospital)
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Background: Neuromuscular disorders (NMD) such as Duchenne Muscular Dystrophy (DMD) are characterised by slow progressive muscle atrophy and weakness [1]. Weak respiratory muscles, loss of ambulation and mechanical factors, cause a reduction in total lung capacity (TLC) and Vital Capacity (VC). Patients are at risk of developing acute conditions that decrease pulmonary function and in turn trigger acute respiratory failure [2]. Due to advancements in respiratory interventions NMD patients are progressing into an adulthood healthcare setting; there is a need for intervention in this phase of transition [1]. Currently in Ireland, children with NMD are diagnosed in a paediatric setting and transition to adult services without a designated medical consultant. In January 2012 a multidisciplinary Neuromuscular Respiratory Clinic was established in Beaumont Hospital. This is the first clinic of its kind in an adult setting in Ireland.

Methods: The main aim of this project was to profile the patients who have attended the clinic since its establishment and to survey all patients who attended to determine patient clinic satisfaction. The patient profile was completed using a retrospective review of patient charts that attended the clinic from January 2012. Patients were surveyed at a clinic visit during the summer period.

Results: Forty-one patient records were reviewed. The majority of the patients (56%) presented with a form of Muscular Dystrophy (MD). 76% of patients were male. The age range upon first visit was 18 – 69 years with 51% of patients under 35yrs. 78% of patients reported a Peak Cough Flow below 270 L/min and 22% had an FVC of less than 1 Litre. 7 out of the 13 patients who had pulmonary function tests carried out recorded an FEV1 below 50% of the predicted value. Interventions provided included breath stacking, deep breathing exercises and the use of a cough assist device. Eleven patients made a return visit to the clinic within one year of their first appointment. Due to unforeseen circumstances only eight patients completed the survey, 88% of patients felt they could had a good communication with the care team and 50% felt their visit to the clinic would lead to fewer health problems.

Conclusions: The low age profile justifies the need for this clinic. There is currently no clinic in Ireland accommodating this patient group and access to a care-team such as this is vital to the continued management of their condition. Overall patient satisfaction was positive although the number surveyed was small.

References

A29
Reconstruction of a full thickness nasal alar defect following resection of a BCC with a vascularised chondrocutaneous helical rim flap: a case report
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Background: Nasal reconstruction presents a challenge for plastic surgeons due to the prominent location and complex structure of the nose. When reconstructing full-thickness nasal defects, options to replace the inner lining, cartilaginous framework and outer skin must be considered. The aesthetic units of the nose must also be replaced in full rather than simply filling holes. This report presents a case of a 62 year old male who’s full-thickness alar defect due to resection of a basal cell carcinoma (BCC) was reconstructed using a free chondro-cutaneous helical rim flap based on a retrograde flow superficial temporal artery pedicle.

Methods: The margins of the existing defect were excised by a further 5mm as suggested by histology. A mould of the defect was made using bone cement and used to plan the harvest site of the flap from the left helical rim. The flap was raised based on a retrograde superficial temporal artery and consisted of cartilage from the helical rim, skin from the anterior and posterior surfaces of the helix and a small segment of post-auricular skin. A 10cm inter-positional pedicle was harvested from the descending lateral circumflex femoral artery and vein from the right antero-lateral thigh (ALT). This inter-positional ALT pedicle was tunnelled under the cheek to reach the facial artery and vein in the submandibular region as the vessels in the naso-labial fold were not suitable for anastomosis.

Results: The vascularised free chondrocutaneous flap allows reconstruction of the three layers of the nasal ala: the inner lining, cartilaginous framework and outer skin, in one procedure. Due to similar sun exposure, the auricular skin also provides a good match to nasal skin in terms of colour and texture. The natural curvature of the helical rim at the root is similar to that of the nasal ala. The resulting ear defect with be reconstructed at a later stage using a cartilaginous graft from the costal margin and skin grafting.

Conclusions: As 30% of head and neck BCCs are nasal, consideration of reconstructive options following resection is an important part of patient management. The vascularised helical rim flap allows reconstruction of all 3 layers of the nasal ala with a good aesthetic result due to adequate matching of contour, colour and texture. The location of any scarring is inconspicuous in comparison to a local forehead flap that could also be used to reconstruct such a defect.

A30
An evaluation of outcomes, interventions and behaviour modifications following a cardiovascular MRI in HIV infected patients
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Background: The advent of antiretroviral therapy has led to increased life span which has been associated with an increase in cardiovascular risk factors and heart disease (Boccara F et al, 2013 [1]). Cardiovascular risk assessment is now advised for those with HIV. The field of behavioural cardiology is particularly applicable in HIV therapy due to the long term nature of such a condition. Therefore, it’s useful to assess behaviour modifications following comprehensive cardiac evaluation, specifically CMRI.

Methods: This is a cross-sectional study examining the medical outcomes, interventions and behaviour modifications in a cohort of 184 male (169 HIV positive compared to 21 HIV negative controls), HIV positive patients at the GUIDE Clinic. The purpose of the study was to compare these variables in 148 patients who underwent a cardiac MRI (CMRI) versus 36 patients who underwent a Framingham risk assessment. The initial study involved the identification of cardiac abnormalities by blood tests and CMRI scan, while the follow-up involved changes in lifestyle, medications as well as cardiac relevant events.

Results: When comparing the two groups, 8.8% of the CMRI group quit smoking while only 2.8% of the Framingham group did. Of the CMRI group, 7.4% commenced new cardiac medication while commencement in the Framingham group was 8.3%. Of the CMRI group 16.2% had further cardiac investigations after their CMRI compared to 8.3% in the Framingham group.

Conclusions: Having a cardiac MRI seems to be more effective in producing behavioural modifications as well as more precise medical diagnoses in HIV positive patients. Ideally, Framingham Risk Assessments should be altered to include HIV specific CVD risk factors; however this model does not yet exist. Due to the increased CVD risk factors seen in HIV positive patients, cardiac assessments need to be performed more routinely with a lower threshold for further cardiac investigations.

Reference
A31
The psychiatric effects of varenicline on patients with depression
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BMC Proceedings 2013, 9(Suppl 1):A31

Background: Varenicline is currently the most effective smoking cessation medication. Pre-marketing clinical trials excluded participants with psychiatric disorders, such as major depressive disorders. This study investigated the psychiatric effects of varenicline among patients with depression.

Methods: On 18 December 2012, a systematic search was performed using Medline with the following search terms: 1) varenicline and 2) depression. The search was limited to English articles, case reports, and original clinical studies. From the 58 retrieved documents, 15 articles were used in this review.

Results: The first case report on the effects of varenicline on patients with depression was published in June 2008. A man experienced an acute exacerbation of depressive symptoms, which resolved after he stopped his varenicline treatment. [1] Since then, there were 8 other case reports that described exacerbation of psychiatric symptoms in patients with depression taking varenicline (2-9). Two of those case studies suggested the use of sertraline [7] and bupropion [8] to treat exacerbation of depressive symptoms associated with varenicline. In contrast, varenicline was shown to improve the affective symptoms of a smoker who developed depression and suicidal tendencies during previous cessation attempts [10]. There were 3 observational studies on patients with depression taking varenicline: 1) a one-year follow-up study on 112 smokers showed an association between increased Beck Depression Inventory score and continued smoking after 12 weeks of varenicline [11]; 2) an open-labelled study showed significant improvement in mood in 110 outpatient smokers with persistent depressive symptoms [12]; and 3) A smoking cessation trial on 217 varenicline users showed that depressive symptoms at the time of varenicline initiation (measured by Patient Health Questionnaire-2) were associated with suicidal ideation. [13] There were 2 clinical trials on patients with depression taking varenicline, with both of them showing worsening of psychiatric symptoms. [14,15] Neither of the trials were placebo-controlled.

Conclusions: Despite some inconsistencies, the findings suggested that varenicline could worsen psychiatric symptoms in patients with depression. Clinicians should be advised to closely monitor patients with a history of depression on varenicline, although there were no studies on how to treat those patients. Bias and uncontrolled confounders potentially affected previous studies, and thus, a double-blinded placebo-controlled trial is needed to demonstrate the efficacy and side effects of varenicline on patients with depression.

References

A32
Development of a malignant hyperthermia protocol
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BMC Proceedings 2015, 9(Suppl 1):A32

Background: Malignant Hyperthermia is a life-threatening condition triggered by exposure to certain general anaesthetics (halothane, sevoflurane, and desflurane) and depolarising muscle relaxants (suxamethonium).

Malignant hyperthermia happens primarily due to mutation of the ryanodine receptor type 1 (RYR1), located on the sarcoplasmic reticulum in myocytes. This mutation leads to increase in calcium release, muscle contraction, and heat production. Dantrolene, a skeletal muscle relaxant, is the drug of choice for malignant hyperthermia because it binds to RYR1 and thereby reduces the calcium released from the sarcoplasmic reticulum. Dantrolene has been shown to significantly reduce mortality when given promptly.[2,3] A hospital is recommended to keep a minimum stock of 36 dantrolene vials, which provides 720 mg of dantrolene sufficient for a 70-kg person.[4] This study investigates whether the hospitals in the region of Fraser Health Authority, Canada, have sufficient dantrolene vials in stock.

Methods: A visit was made to the eleven hospitals’ operating rooms in the region. The expiry date and location of the dantrolene vials were recorded. The operating room staff were interviewed to determine their knowledge on the treatment procedure of malignant hyperthermia.

Results: Four of the hospitals were found to have less than 36 vials of dantrolene in the operating rooms. Most of the staff never treated patients with malignant hyperthermia and did not know the reconstitution procedure of dantrolene.

Conclusions: A dantrolene cart, which consisted of 36 vials of dantrolene and a simplified reconstitution instruction, was determined to be necessary. The cart would also have other supplies for management of malignant hyperthermia, including furosemide, lidocaine, calcium chloride, dextrose, sodium bicarbonate, sterile water, regular human insulin, and syringes. Routine stock quantity and expiry date checks would be carried out. One of the hospitals was recommended to stock 72 vials of dantrolene. The extra vials would be transferred to another hospital during shortage of dantrolene in emergency situations. Quarterly drills on reconstitution of dantrolene and treatment of malignant hyperthermia were also deemed to be necessary.

References
A33
General practitioner knowledge, skills and attitudes to eating disorders
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BMC Proceedings 2015, 9(Suppl 1):A33

Background: Given that general practitioners are perfectly placed to detect eating disorders this summer research study aimed to examine general practitioners’ knowledge, skills and attitudes towards eating disorders. The study aimed to compile a national picture of the diagnosis, referral practices, and management of eating disorders in primary care in Ireland.

Methods: An online survey consisting of 20 questions previously used in an American study was emailed to Irish general practitioners (GPs) of which 226 emails were read. The study remained open over a three week period. The email addresses were obtained via the Irish Medical Directory and through phone calls to surgeries. Ethical approval was granted by RCSI.

Results: Response rate was 22%, similar to previous studies in this field. More than one third of general practitioners reported they don’t have the skills to treat an eating disorder (ED). More than a quarter reported there were no resources available to them for treating eating disorders and 36% had missed an ED diagnosis with a patient who was subsequently discovered to have an eating disorder. A total of 60% of respondents felt uniformed regarding how to conduct an ED screening. 54% said they didn’t know how best to talk to an ED patient about weight management. Almost half responded that they felt uninformed about what local resources were available to them.

Conclusions: Eating disorders are currently underdiagnosed in primary care. Further information about prevalence rates and additional training opportunities are desired by GPs in the area of eating disorders. Improved referral facilities are required especially outside of Dublin. A nationwide study of GPs is necessary as a follow up to this pilot study in order to get a complete picture of eating disorders in Ireland.

A34
Quantification of ATP and ADP levels in platelets from healthy human donors: a potential novel indicator of cardiovascular risk
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BMC Proceedings 2015, 9(Suppl 1):A34

Background: Understanding the biology of platelets is essential for the management of thrombotic diseases like stroke and cardiovascular disease. Platelets store ATP and ADP biomolecules and secrete them in response to thrombotic stimuli. However, patient-to-patient variability in storage of these biomolecules in platelets is poorly studied. This study assesses ATP and ADP concentration in platelets and determines (1) the absolute values of these biomolecules per platelet, (2) the ratio of ATP to ADP in platelets and (3) the quantities released from dense granule storage sites in response to a discrete stimulus (Thrombin receptor activating peptide (TRAP); 10μM).

Methods: A total of 21 healthy human donors were recruited with full ethical approval. Washed platelets (5x10⁸/mL) were assessed with a commercial Enzyte ADP/ATP Ratio Assay Kit to evaluate the total amounts of ATP and ADP. Briefly, platelets were stimulated with TRAP, or left unstimulated, in a 96-well plate containing a mixture of luciferase, substrate, co-substrate and/or ADP enzyme. Nucleotide levels were measured using a Wallac1420 multi-label counter. In parallel wells, detergent was added to platelet samples to allow determination of the total ATP and ADP load in the platelets.

Results: The total levels of ATP and ADP biomolecules in platelets were 0.24 ±0.03 (nmoles per 10⁸ platelets) and 0.23 ±0.04 (nmoles per 10⁸ platelets), respectively. The ratio of ATP to ADP, secreted from platelets upon activation by TRAP was 2.1 ±0.51 (pmoles per 10⁸ platelets) and 3.35 ±0.87 (pmoles per 10⁸ platelets), respectively. The ratio of ATP to ADP, secreted from platelets upon activation, was 1:1.59.

Conclusions: Although platelets contain a baseline excess of metabolic ATP over ADP (Ratio= 1.04: 1), an excess of bioactive ADP is secreted in response to platelet activation. Moreover, we have also identified that there is a marked difference in the amount of ADP released by different donors. Therefore, understanding the intrinsic levels of ATP and ADP may lead to the identification of novel diagnostic method, which may assist in the early identification of patients at risk for thrombotic disorders. Future studies will compare ATP/ADP levels and ratios, between healthy patients and patients with thrombotic disease(s), in order to identify any differences between their total and released amounts of ATP/ADP and the ratio between them.

Reference

A35
Factors affecting adherence in cardiovascular protective medications: An UMPIRE sub-study
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Background: Adherence to protective cardiovascular medications is of huge importance in the prevention of serious morbidity and mortality [1]. This study seeks to identify factors that influence adherence to the treatment of cardiovascular medications and to analyse the characteristics of the baseline non-adherence Irish cohort of the UMPIRE study. UMPIRE (“Use of a Multidrug Pill In Reducing Cardiovascular Events”) was a prospective, randomised, open-label, blinded-endpoint (PROBE) clinical trial carried out in three locations in Europe (Ireland, The Netherlands and the UK) as well as India. The Irish cohort was a total of 333 participants (total trial 2,004 of which half in India). It had a key eligibility criterion of established cardiovascular disease (CVD) or an estimated 5-year CVD risk of ≥15%. The results were present at the American Heart Association 2012 Scientific Sessions.

Methods: A literature review was carried out to identify evidence for factors affecting adherence in the treatment of hypertension. A database of patient profiles and health measurements was created and analysed using Excel and DataDesk. The unpaired Students t-tests and Chi-squared tests were used to test for differences between baseline adherent and non-adherent groups and the results were then compared with expectation from the literature review.

Results: Several significant factors affecting adherence were suggested from the analysis of the Irish UMPIRE cohort. Younger age, a higher educational status and a lack of a Medical card were associated with non-adherence. There was a trend, consistent with the UMPIRE study, for higher systolic blood pressure, heart rate and LDL cholesterol levels in the non-adherent cohort as would be expected.

Conclusions: Economic pressures appear to be a significant predictor of adherence which may account for the contrary findings to the literature review on age and educational status. In the Irish context, this might be attributed to younger middle income individuals having greater financial liabilities than their older peers on average.

Reference

A36
The importance of CFTR expression for neutrophil function in patients with Cystic Fibrosis
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BMC Proceedings 2015, 9(Suppl 1):A36
Background: Cystic fibrosis (CF) is a genetic disease characterised by chronic bacterial infection of the lung and destruction of lung tissue eventually leading to respiratory failure. CF is caused by mutations in the CF transmembrane conductance regulator (CFTR) gene. Current treatment focuses on managing the symptoms of CF including antibiotic therapy against respiratory infections and vitamin and enzyme supplements to treat pancreatic insufficiency. However, a new drug known as ivacaftor has been approved recently that treats the CF illustrated altered gene expression and increased release of proteases from primary granules. However, it remains unknown whether neutrophil dysfunction is due to chronic inflammation or the CFTR defect. Our hypothesis is that impaired neutrophil activity in CF is directly caused by a lack of CFTR protein and function. Therefore, the aim of this study was to examine CFTR expression in neutrophils by optimising the methods for optimal CFTR protein detection, by comparing the levels of expression of mature CFTR protein in healthy control and CF neutrophils to epithelial cells and by examining the function of the CFTR channel in neutrophils.

Methods: Ethical approval was obtained from Beaumont Hospital institutional review board. Cell proteins were isolated from purified neutrophils from healthy controls and CF patients. The CFTR protein was investigated by Western blot analysis. Healthy control cells were loaded with the chloride sensitive dye MQAE and changes in intracellular chloride were measured following treatment with the CFTR inhibitor CFTR (inh)-172 (10 mM) to examine the function of the channel.

Results: Results clearly confirm the expression of the CFTR channel in neutrophils with levels of the mature, membrane CFTR being reduced in CF cells. Inhibition of CFTR function using the CFTR(inh)-172 resulted in accumulation of cytosolic chloride in healthy neutrophils.

Conclusions: The results of this study strongly support a role for CFTR in neutrophil activity and dysfunctional CFTR may directly cause the impaired neutrophil killing ability which is observed in CF patients. Additionally, the presence of the CFTR protein makes it possible to treat neutrophil dysfunction directly using new drugs such as ivacaftor that correct the CFTR defect. This study was funded by the Alumni Office Claire and Nid Afndal Award in Medicine.

A38 The efficacy of the current adult observation chart: audit of compliance with trust guidelines at City Hospital, Birmingham, UK

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BMC Proceedings 2015, 9(Suppl 1)E38

Background: The Royal College Of Physicians (RCP) has shown that the multiplicity of locally developed Early Warning Scores (EWS) used throughout the UK is causing a ‘lack of consistency in detecting the deterioration of patients’ [1]. The RCP therefore produced a report in July 2012 proposing a National Early Warning Score (NEWS), a point based system, with the aim of standardisation across the UK. However, there is concern that if locally developed systems are working well why “fix what isn’t broken”. The current system used at Sandwell & West Birmingham Hospitals (SWBH) NHS Trust, UK is a simple colour coded observation chart. As observations become more abnormal they are documented in amber or red zones on the chart. Instructions on the chart explain that single “amber”, double “amber” or “red” observation should trigger a specified action, to be documented in the clinical notes, and increased frequency of observations. Previous audits of patients admitted to the Intensive Care Units of SWBH indicated that even this simple colour coded system was not accurately followed and could indicate that the NEWS, a more complicated point based system, may worsen compliance. The aims of this audit were to evaluate adherence to the current colour-coded EWS adult observation chart across a variety of wards.

Methods: 194 patients charts were reviewed during the 2012 winter period. For each patient, all observations over the preceding 24hrs were assessed. If they indicated that further action should be taken, the nursing and medical notes were consulted.

Results: 25% of patients had an incomplete set of observation parameters recorded. For single “amber” observations only 21% had any subsequent action recorded and 67% had their frequency of observations increased. For double “amber” observations the results were 33% and 83%. Of the 11 red observations, only 3 had actions documented.

Conclusions: The results highlight that the current chart does not appear to be as effective or utilised in the way that it was designed. To re-establish effective use of the current chart will require a massive trustwide education programme. The proposed RCP NEWS system has been tested and demonstrated to be an effective system for identifying at risk patients. It may make more sense to concentrate education efforts on the introduction of the RCP NEWS system rather than re-launching the old one.

Reference
A39
Investigation of the therapeutic applications, neuroanatomical targets and emerging technologies in deep brain stimulation surgery
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BMC Proceedings 2013. 9(Suppl 1):A39

Background: First developed in France in 1987, Deep Brain Stimulation (DBS) is a neurosurgical intervention that involves the implantation of a brain pacemaker, which electrically stimulates specific brain nuclei.1 The FDA approved DBS for treatment for Essential Tremor in 1997, Parkinson’s Disease in 2002 and Dystonia in 2003.1 More recently, DBS has been indicated in management of neuropsychiatric disorders such as: Chronic Pain, Major Depression, Obsessive Compulsive Disorder and Anorexia Nervosa. Although effective, the exact mode of function of DBS remains poorly understood. Up to 2012, literature search yielded 84 peer-reviewed DBS studies that included over 296 psychiatric patients.2 The Canadian United Health Network (UHN) Krembl Neuroscience Centre is pioneering DBS research. Current neuroimaging, intra-operative electrophysiology and emerging DBS electrode and targeting technologies have improved DBS accuracy, effectiveness and acceptability. Objective: To examine the role of DBS in the management of motor and neuropsychiatric disorders and to provide, for the first time, a review of all anatomical DBS targets to date. To evaluate the accuracy of emerging DBS targeting and electrode technologies.

Methods: Research for this paper was carried out using Pubmed, UHN online library, Medline, Google Scholar and UHN Grant Reviews. Papers were limited to those published in English between the years 2000 and 2013. Research was conducted at the Department of Radiology at the Toronto Western Hospital, UHN.

Results: More than 26 anatomical targets have been identified for the treatment of movement and neuropsychiatric disorders. There is yet to be a large longitudinal cohort study confirming DBS usefulness and safety. DBS decreases disease burden by providing immediate improvement in the quality of life. Cost–utility analysis reveals that DBS has a high Quality-Adjusted Life Year (QALY) score.3 New neuroimaging technologies are enhancing DBS preoperative neuroimaging planning, intraoperative neuroimaging guidance and post-operative neuroimaging follow-up. Anatomical brain atlases, combined MR/CT, electrophysiological databases, registered surgical targets of previous patients and integrated functional and anatomical references have cumulatively shown to increase DBS targeting accuracy.4 Emerging research aims at developing electrodes from non-metals such as Carbon, in order to prevent metal-induced field distortion and MR artefacts. Guide tubes and stylettes are being introduced to refine DBS accuracy.

Conclusions: DBS is a promising technology for severe, chronic movement and neuropsychiatric disorders. Continuous efforts to increase DBS targeting accuracy, improve on current DBS equipment systems and identify new anatomical targets are currently internationally pursued.

A40
The prevalence of liver abnormalities in individuals with ZZ Alpha-1 Antitrypsin deficiency
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BMC Proceedings 2015. 9(Suppl 1):A40

Background: Alpha-1 antitrypsin deficiency (AATD) is a hereditary disorder defined by low plasma levels of alpha-1 antitrypsin (AAT). It is linked primarily with the development of lung, liver and skin disease. The most common genetic variant of AAT is the ‘Z’ variant. It is the AATD type most associated with the development of liver disease. The aim of this project is to determine the prevalence of liver abnormalities in ZZ AATD individuals.

Methods: The study cohort included 115 ZZ AATD patients. The study population was drawn from AATD patients attending the National AATD referral centre in Beaumont Hospital. The cohort is racially homogenous and the mean age is 52 ± 12 yrs (62 male and 53 female). All 115 patients provided serum samples which underwent confirmation of AATD status by phenotyping. Patients answered a standardized questionnaire about their social history and patient charts, abdominal ultrasound records, and liver function tests were reviewed to determine the incidence of liver abnormalities.

Results: Of the 115 people with AATD in our study, 45 had liver function test abnormalities. There was no correlation between increasing age and liver function test abnormalities. Thirty of the study subjects had liver abnormalities on liver ultrasound, the majority having fatty infiltration. There was no difference in BMI in those with or without liver disease. Of the 115 studied 80 answered the personal and social history survey concerning alcohol consumption. In those with liver disease 21 out of 30 participated in the survey. There were no significant differences in alcohol consumption between those with liver disease and the general AATD population.

Conclusions: In this study we found that liver disease is relatively common in the ZZ cohort, with over 25% having abnormal liver ultrasounds and over 35% having abnormal liver function tests. This is in keeping with other studies. We found no correlation between increasing age and abnormal liver function tests. We saw no link between alcohol consumption and abnormal liver ultrasounds. The frequency of fatty liver in the liver disease group raised the possibility that this was a result of increased obesity and not specifically AATD; however, there was no significant difference in BMI in this group compared to the overall ZZ population.

Reference

A41
In vitro evaluation of a prodrug approach for Gly-D-P18, a host defence peptide and novel anticancer agent
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BMC Proceedings 2015. 9(Suppl 1):A41

Background: Host defence peptide (HDP) has multiple properties [1,2] potentiating it as a novel anticancer agent. However disadvantages include systemic toxicity [3]. To address this, a prodrug was developed and the aim was to assess toxicity differentials between this prodrug and its active peptide component on T84 colonic carcinoma cells. Prodrug bioactivation mechanism was also assessed by use of a Cathepsin B inhibitor.

Methods: Two peptides were provided: Gly-D-P18 and its prodrug form. The prodrug, containing a linker which will serve as substrate for a tumour associated protease, Cathepsin B, and activate the drug. T84 cell lines were cultured separately with Gly-D-P18 and its pro drug at concentrations of 1 µM and 10 µM over 24 hours. Effects were evaluated by LDH assay. Transepithelial resistance and Electrophysiological measurements. Cathepsin B inhibitor was also incubated, at concentration of 10 µM, 1 µM, 200 nM and 4 nM with pro drug on T84 cells over 24 hours and their effects assessed by transepithelial resistance and LDH measurement.

Results: Pro drug caused a drop to 74.45% of initial resistance for 1 µM (n=5) and 22.56% for 10 µM (n=5) concentrations, in comparison to Gly-D-P18 with 52.33% (n=5) and 21.676% (n=5) respectively. Also, the use of 10 µM prodrug with Cathepsin B inhibitor at 10 µM (n=3), 1 µM (n=3), 200 nM (n=3), 4 nM (n=3) concentrations resulted in a drops to 34.12%, 26.974%, 30.009%, 25.977% of initial resistance respectively, compared to 26.804% of initial resistance from standalone prodrug (n=3) treatment. No effects were seen with regards to LDH release or chloride secretion.

Conclusions: While the prodrug had comparatively decreased resistance drop, inconclusive results and limitations indicated need for further experimentation. In future, one could include usage of wider range of viability tests and comparisons against treatment with prodrug with uncleavable linkers as well as on healthy cells.

References


A42
Delay in referral to hot foot clinic; a root cause analysis and suggestions for service improvement
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BMC Proceedings 2015, 9(Suppl 1):A42

Background: Approximately 125 diabetes dependent amputations are carried out in the UK each week, which is anticipated to increase by 17% by 2014. With 80% of amputations being preventable, in 2012, NHS diabetes launched a campaign to reduce these figures by 50% by 2018 [1]. In light of this, a multidisciplinary hot foot clinic was established in Weston Area Health Trust. The clinic aim is that of early identification and treatment of foot ulceration and ensuring patients are receiving adequate community follow up, education and orthotics, where needed. The aim of the current project was to assess the care pathway leading to referral to the clinic and performing a root cause analysis on delay in referral.

Methods: Questionnaires were completed with 10 patients attending the hot foot clinic in two consecutive weeks in Weston General Hospital. The questionnaire assessed; patient factors, pathway of referral to clinic, footcare and education and patient satisfaction. Results of the study were compared with the most recently published Weston Area Health guidelines.

Results: All 10 patients had type II diabetes. It took an average of 25 days to identify the foot pathology and a further 45 days to be referred onto clinic. Once referred, the average wait for an appointment was 9 days. 60% of patients could comment on how to personally care for their feet and 50% were known to community podiatric services. None could recall their foot risk score from their previous annual review. A root cause analysis identified four areas contributing to a delay in referral to clinic; patient education, staff education, community foot care services and problems surrounding communication amongst the diabetic multidisciplinary team (MDT).

Conclusions: Foot complications remain a huge burden on the NHS budget and patient quality of life. Employment of guidelines set out by NICE and NHS diabetes is crucial to achieving the 50% reduction in amputations. However, the current study also proposes the development of a combined diabetic care, handheld patient booklet, to allow empowerment of the patients on their condition and improved communication between the members of the diabetic MDT.

Reference

A43
Could coagulase negative staphylococci be an evolutionary source of resistance genes for Staphylococcus aureus?
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BMC Proceedings 2015, 9(Suppl 1):A43

Background: The remarkable ability of Staphylococcus aureus (SA) to acquire mobile genetic elements that carry virulence and antibiotic resistance genes, contributes to its success, pathogenicity and evolution. There is indirect evidence that methicillin-resistant S. aureus (MRSA) clones arose from genetic transfer of staphylococcal cassette chromosome mec (SCCmec) from Staphylococcus epidermidis and other coagulase-negative staphylococci (CNS) to methicillin-susceptible S. aureus (MSSA). These staphylococcal species are often co-located in human reservoirs such as the nose and this niche may provide an environment in which genetic transfer is favoured. The aim of this study was to demonstrate that methicillin-resistant coagulase-negative staphylococci (MR CNS) are commonly found in the nose of MRSA-positive patients and to provide evidence of antibiotic resistance gene transfer among these species.

Methods: We developed a method for the recovery of MRCNS from MRSA-positive swabs. Colonies recovered from the nasal swab were identified as MRSA and MRCNS through phenotypic characteristics. Genetic analysis using multiplex PCR for S. aureus marker gene and methicillin resistance gene mec-A further confirmed the identity of these colonies. Paired isolates of MRSA and MRCNS recovered from the same clinical site, were stored on cryoprotect beads at -80°C for further investigation.

Results: MRCNS and MRSA were recovered from the same swab in approximately 45% of swabs investigated. Comparative DNA microarray analysis of five matched MRSA and MRCNS pairs indicated that they had mecA, and SCCmec elements in common suggesting that they share the same mec gene complex (SCCmecIV).

Conclusions: MRCNS and MRSA share a common niche in the human nose and harbour similar antibiotic resistance genes that reflect a history of genetic transfer between these species. S. epidermidis and other CNS may serve as a potential reservoir for evolution of MRSA strains with enhanced virulence and antimicrobial resistance.

A44
The thymic flap for bronchial stump reinforcement following lobectomy
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BMC Proceedings 2015, 9(Suppl 1):A44

Background: Reinforcement of the bronchial stump following upper lobectomy has been reported to decrease the prevalence of bronchopleural fistula [1]. A parietal pleural flap remains the mainstay of surgical support for such cases.

Methods: We present the successful use of the right inferior pole of the thymus for bronchial coverage following upper lobectomy due to extensive pleural adhesions from previous rib fractures, where a solitary malignant intrapulmonary peribronchial lymph was identified. Due to extensive pleural adhesions from previous rib fractures, the right inferior tip of the thymus was mobilized from the pericardium and retrosternal attachments and used to secure the bronchial stump. The patient remains well following an uneventful recovery. Post-lobectomy bronchopleural fistula remains a rare and serious complication with an incidence rate between 0.5%-0.99% [2]. Persistent empyemas necessitating open drainage and prolonged hospitalization contribute to a high mortality rate ranging from 25%-67% [2]. A reduction in complications had been reported with the incorporation of pleural,diaphragmatic, intercostal and azygous vein bronchial stump reinforcements [1]. In our case, the thymic flap was mobilized due to inability to successfully dissect the parietal pleura. Infante et al (2004) evaluated the protection of right pneumonectomy bronchial sutures with a pedicled thymus flap where 82% (27/33) of cases had a satisfactory thymic inferior pole length [3].

Conclusions: The thymic flap appears to be a valid conduit for reinforcement of the bronchial stump particularly in patients with extensive pleural adhesions limiting mobilization of the other traditional flaps.

References
A45

Characterisation of E12/E47 expression in colorectal cancer

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BMC Proceedings 2013, 9(Suppl 1):A45

Background: In the Western world colorectal cancer is one of the leading causes of cancer-related mortality, and the second most common cancer in women and the third in men. Identification of prognostic markers capable of predicting patient response to chemotherapy is essential to determine more personalised and efficient treatment strategies in colorectal cancer, and may help identify novel therapeutic targets. The aim of the study was to characterise the expression of the E2A transcriptional regulator proteins, E12/E47 (also known as TCF-3 or E2A) in colorectal cancer patient tissue samples. Primarily E12/E47 antibody optimisation was required to allow us to subsequently examine E12/E47 protein expression in colorectal cancer tissue and investigate any correlation with patient outcome.

Methods: Candidate antibodies directed against the E12/E47 protein were first evaluated by western blotting and densitometry assays on four different types of human colon cancer cell lines. Surgically resected colorectal tumours were obtained from 198 patients presenting with Dukes B and C colorectal cancer. Tissue microarrays were then formalin-fixed paraffin-embedded samples. Tissue microarrays were then stained with varying dilutions of the candidate antibodies to establish a reliable and reproducible staining protocol.

Results: In order to optimise the E12/E47 staining on tissue samples, two different antibodies, a rabbit monoclonal TCF-3 antibody (Cell Signalling) and a rabbit polyclonal E2A antibody (Santa Cruz) were used. Serial dilutions of these antibodies were made to determine the optimal concentration of antibody to use. Using immunohistochemistry, the first antibody did not detect any specific signal while a nuclear/cytoplasmic localisation of E12/E47 was identified in some tissue samples using the E2A antibody. This staining was scored in line with the Allred Immunohistochemistry Scoring system.

Conclusions: Via antibody and protocol optimisation we were able to establish a protocol to specifically identify E12/E47 protein in human colorectal cancer tissue microarrays. This enables us to identify whether a correlation between E12/E47 expression in colorectal cancer patient tissue exists and whether it expression is linked to tumour aggressiveness. The identification of novel colorectal cancer markers may be relevant for diagnosis and treatment of cancer patients.

A47

Assessing the effect of mutant JAM-A overexpression on downstream signalling in breast cancer cells

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BMC Proceedings 2015, 9(Suppl 1):A47

Background: Breast cancer causes the most number of deaths in females worldwide [1]. It contributed to 14% of cancer deaths in 2008 and is also the most commonly diagnosed cancer in women globally. Overexpression of the tight junction protein junctional adhesion molecule-A (JAM-A) in breast cancer tissue is known to produce less favourable outcomes in breast cancer patients. Overexpressed JAM-A may accomplish this by influencing downstream signalling of key proteins involved in cell proliferation, migration and the reaction of cells to therapeutic agents. This study aims to further investigate the promising role of JAM-A in breast cancer advancement by assessing the consequences of changing the structure of JAM-A on 10 key signalling proteins related to tumour progression.

Methods: Three MDA-MB-231 cell lines were cultured. Two of the cell lines overexpressed JAM-A mutants, one with the first Isg loop deleted (DL1) and another with mutations at E61A and K63A (1613). The third was an empty vector cell line with normal levels of non-mutated JAM-A (EV). Preliminary Western blotting studies were used to screen cell lines for 10 key signalling proteins associated with tumour aggressiveness. The optical density for each band formed on film were analysed using ImageJ software. For each signalling protein, the density reading for each cell line was compared against the EV cell line that was given a base value of 1.

Results: Overexpression of mutant JAM-A (DL1) resulted in increased levels of PAR6, p38, phospho-p38, aPKC, p11 integrin, pERK, pAKT and PAR3 signalling proteins. PTEN and ERK levels were essentially unchanged. Overexpression of mutant JAM-A (1613) resulted in increased levels of p38, phospho-p38 and pERK; while PAR6, aPKC, p11 integrin, ERK, pAKT and PAR3 all showed decreased levels.

Conclusions: Our data in breast cells show that mutation of JAM-A can alter the levels of 10 key signalling proteins. In various studies conducted,
increased levels of Par6, p28, phospho-P28, pPKC, beta1 integrin, ERK, pERK and pAkt may facilitate tumourigenicity, while decreased levels of PAR3 and PTEN in cells may do likewise. Thus the changes in signalling protein levels acquired from our data suggest that mutant JAM-A (DL1) assists the development of malignancy in breast cancer cells, however mutant JAM-A (6163) may not have the same effect. There is currently a scarce pool of knowledge on the role of JAM-A in breast cancer advancement and our study provides a rationale for further investigation into this relationship.

A48
Prevalence and risk factors for modified prescriptions in an Irish community pharmacy
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BMC Proceedings 2015, 9(Suppl 1):A48

Background: Little research exists of rates of prescribing errors and prescription modifications, or risk factors for same, in Ireland.

Methods: A cross-sectional study was performed to examine prescriptions dispensed in a community pharmacy over a period of 5 weeks from November 19 to December 21 2012.

Results: In total, 866 prescriptions were examined. The overall prevalence of prescription modifications was 17.9% (155/866), with a mean of 31 modifications per week. Prescription error requiring a simple clerical clarification before dispensing could occur, with the remaining 19 (12.9%; average of 3.8 per week) potentially having clinical consequences if left unaltered. Half (51%) of all POM modifications occurred through consultation with the patient or their representative. The following factors were associated with increased risk of POM modifications: being a female patient (OR = 1.605, 95% CI 1.104-2.333, p = 0.013) and being prescribed drugs in the following therapeutic areas: musculo-skeletal (OR = 1.906, 95% CI 1.023-3.551, p = 0.042) and genito urinary system and sex hormones (OR = 3.691, 95% CI 2.255-6.042, p< 0.001). Multivariate analysis showed these were significant independent determinants of POM modifications, remaining so after adjustment.

Conclusions: The majority of prescribing errors modified involved non-serious clerical errors. However an average of 3.8 POM prescriptions with potential clinical consequences were modified weekly.

A49
The criminal gene: the link between MAOA and aggression (REVIEW)
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BMC Proceedings 2015, 9(Suppl 1):A49

Background: One emerging aspect of recent advances in neurocriminology is the discovery of possible links between violent criminal behaviour and genetic factors. Analysis of data from several studies indicates that the strongest link between genetic variation and aggression comes from monoamine oxidase A (MAOA); a gene encoding an enzyme responsible for catabolising amine neurotransmitters such as dopamine, serotonin and noradrenaline. In this work, we present a critical review of the data available from recent investigations regarding the impact of an allelic variation of the MAOA gene on criminal behaviour.

Methods: The main approach used in this work was reviewing and analysing data presented in a variety of research papers accessed through electronic search.

Results: The low activity form of the MAOA gene (MAOA-L) has been linked to increased levels of aggression and violence. Data from a 2007 study suggests that MAOA-L individuals are hypersensitive, so are affected more by negative experiences (thus react more aggressively in defence) as opposed to being hyposensitive, and lacking emotion for harming others. Male members of a large Dutch kindred displaying abnormal violent behaviour were found to have low MAO-A activity linked to a deleterious point mutation in the 8th exon of the gene. The unaffected male members within the family did not carry this mutation. The first study that investigated behaviour in response to provocation showed that, overall, MAOA-L individuals showed higher levels of aggression than MAOA-H (high MAOA activity) subjects. There was also strong evidence for a gene-by-environment interaction as both groups showed similar low levels of aggression with low provocation, but MAOA-L individuals displayed significantly higher levels of aggression in a high provocation situation. A further gene-by-environment interaction was found in a long-term study performed on large number of children. Those with the MAOA-L genotype paired with maltreatment in childhood were correctly predicted to commit crime. Similar results are replicated in the majority of other related studies, but not all.

Conclusions: We present mounting evidence that biological, environmental, and social factors are involved in criminal behaviour. Deficiencies in MAO-A activity have been identified in numerous studies to correlate positively with aggressive behaviour, but its influence may be moderated by environmental factors. Although further research into this aspect of neurocriminology is required, the findings highlight an ethical dilemma with regards to prosecuting criminals. Since individuals cannot be held accountable for their genes, should they be held responsible for their dispositions and resulting actions?

A50
Minimally invasive treatment for breast cancer metastasis to the esophagus
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BMC Proceedings 2015, 9(Suppl 1):A50

Background: Breast cancer metastasis to the esophagus is a rare phenomenon affecting 0.03% of patients with advanced breast cancer. This remains a diagnostic challenge due to frequent asymptomatic presentation.

Methods: We present the successful minimally invasive surgical (MIE) treatment of an isolated metastatic breast lesion to the esophagus.

Results: A sixty-two-year-old female presented in May 2009 with an eighteen-month history of dysphagia due to a chronic benign esophageal stricture, presumed secondary to previous radiotherapy treatment for breast cancer. She complained of occasional heartburn, indigestion and cough and described a 60lbs weight loss due to tolerance of a liquid only diet. She had a fifteen-year smoking history. She had been undergoing monthly esophageal dilatations over the previous six-months. Multiple previous esophageal biopsies were benign. Clinical assessment was unrewarding. Endoscopic ultrasound demonstrated a tight fibrotic stricture at 26cm. Additional biopsies were again negative for malignancy. She was referred for MIE surgical resection. After creation of the pneumoperitoneum and insertion of four trocars, the short gastric vessels were divided followed by mobilisation of the gastric fundus with preservation of the gastroepiploic artery. High mediastinal dissection was performed to mobilize the esophagus followed by a chemical pyloromyotomy. A mini-right posterior-lateral thoracotomy identified a small caliber esophagus which was dissected free of right bronchial adhesions. The esophagus was subsequently divided proximally and distally followed by a stapled anastomosis. Histopathological analysis confirmed an invasive adenocarcinoma consistent with a breast primary. She remains well four-years post-surgery. Unfortunately, in advanced cases, therapeutic interventional strategies tend to target symptomatic palliation rather than curative resection. Conventional open esophagectomy involves a myriad of incisions depending on the tumour site. These incisions create significant patient morbidity.MIE surgery has evolved to minimise patient morbidity compared to conventional open techniques. Shorter operative times without the need to re-position the patient is cost-effective, whilst preservation of the latisimus dorsi muscle may reduce post-operative pain and improve overall quality of life (QOL) post operatively. The four laparoscopic port sites provide adequate abdominal exposure whilst the mini-thoracotomy facilitates esophageal mobilisation and division. Higher physical function index scores have been reported twenty-four weeks following MIE surgery compared to conventional open surgeries.
Conclusions: Despite a lack of randomized trials comparing MIE with the conventional open techniques, current evidence suggests that less invasive interventions improve peri-operative patient experience with improved QOL after surgery.

A51
A patient with Trisomy 13 mosaicism: review and case report
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BMC Proceedings 2015, 9(Suppl 1):A51

Complete Trisomy 13 or Patau’s Syndrome is a relatively common (1/10,000 births) and uniformly fatal chromosomal disorder. In 5% of cases not all cells are trisomic, some cells are euploid [1]. This aberration, known as Trisomy 13 Mosaicism, is not well described but may lead to a milder form of the disease. Descriptive case report and comprehensive literature search of MEDLINE database using PUBMED MeSH terms “mosaicism” and “patau syndrome”. A review of references from selected articles was also performed. A seven-week old girl with an antenatal diagnosis of Trisomy 13 Mosaicism was delivered via an uncomplicated birth to a 35 year old mother of African ethnicity. Dysmorphic features include a third fontanelle, a flat nasal bridge, and polydactyly, clenched fists and “rocketer-bottom” feet. An echocardiography revealed mild congenital heart defects. Management was nasal oxygen and nasogastric feeding in NICU. The patient was discharged home at 28 days of life with no medical needs and liaised with the palliative care team. At 6 weeks the patient remained clinically stable, having experienced one clinically suggestive seizure but no significant deterioration in her condition. This case adds to the currently limited understanding of Trisomy 13 Mosaicism on which we offer an up-to-date review. It discusses the relation of Trisomy 13 mosaicism to the better-known Patau’s Syndrome, particularly with regards to prognosis, and highlights the ethical dilemmas that arise in the management of such patients for whom predicting outcomes has remained extremely challenging to date. In particular, we examine the role of antenatal counseling and the decision of palliation versus active medical management.

Reference

ORAL PRESENTATIONS

A52
Protein biomarkers Ki67, HOXC10 and HOXC11 for the prediction of response to endocrine treatment in breast cancer
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BMC Proceedings 2015, 9(Suppl 1):A52

Background: Breast cancer is a common malignant tumour prevalent in Ireland and rest of the world. Although breast cancer screening and treatment has dramatically improved patient prognosis, it is still the leading cause of cancer-related death for women. One of the major bases for breast cancer treatment is patient’s receptor status: ER, PR, HER2 positive or negative. Immunohistochemistry (IHC) is a technique that diagnoses abnormal cells, which uses antibodies to detect antigens (proteins) of interest in a biological tissue. IHC is widely used in hospitals and laboratories, for screening patient receptor status. In this study, IHC was performed on breast tumour samples obtained at Beaumont Hospital to assess 3 protein biomarkers Ki67, HOXC10 and HOXC11. Aim: This study aimed to use IHC technique to: 1. Optimize HOXC11 staining for use on TMA (Tissue MicroArray). 2. Assess Ki67 staining in a pre-stained TMA 3. Stain full face sections from primary and matched metastatic tissue for HOXC10. Methods: To perform Immunohistochemistry, 3 stages were carried out: TMA preparation, Antigen Retrieval and DAKO staining. The stained tissue samples were scored using Allred Scoring System (for HOXC10 and HOXC11) and Aperio Imagescope (for Ki67) to determine positivity and intensity of its stain. Each patient was then categorised into stain-positive and stain-negative groups, as the binary input data for analysis. Stata 10 software program was used to compare protein profile of the patients with already-existing patient database which also contains information on patient prognosis. Wilcoxon statistical analysis was performed to compare patient outcome based on patient receptor status and protein profile. Results: 1. HOXC11 staining was successful, but inconsistent. 2. HOXC10 is expressed in primary breast tumour; however this expression is lost in matched metastatic tissue. 3. Ki67 positive patients have faster tumour recurrence (p=0.0051). 4. Luminal breast cancer type (ER+ve, PR +ve/ve and HER2-ve) with positive Ki67 status have faster tumour recurrence (p=0.004).

Conclusions: 1. HOXC11 staining optimization is required for a robust staining protocol. Investigating efficacy of other antigen retrieval methods is required such as using a pressure cooker. 2. HOXC10 expression was reduced in metastatic breast cancer, which corroborates findings in the Oesterich lab [1] 3. Ki67 positive status was shown to be associated with faster tumour recurrence and its sub-categorization of Luminal type is agreement with Hughes et al [2] IHC optimization is important for robust understanding of new proteins in cancer, which may help improve personalized medicine and enhance optimal treatment even further.

References

A53
An audit of out of hours MRI scanning at a tertiary care referral hospital
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BMC Proceedings 2015, 9(Suppl 1):A53

Introduction: The aim of this audit was to record the numbers of MRI scans performed out of hours or on-call in a busy tertiary care referral hospital. As this service continues to increase, we look at the trends and patterns in referrer pathways, the clinical indications for these studies, the types of studies performed, the results of these studies and the impact on patient management.

Materials and methods: We retrospectively viewed the on-call MRI logbooks at Beaumont hospital and recorded all scans done this past decade. Regarding each study, the following major parameters were recorded; indication for study, requesting service, type of MRI performed, the result of each study and the impact on patient management. Results: A total of 1332 on-call MRI scans were performed on-call this past decade (2003-2012). The largest increase in scan numbers was from 2010-2011 and 2011-2012. The most frequent scan was that of the spine, followed by the brain. Fifty four percent of scans were positive, with a significant result altering patient management. The largest cohort of scans was referred by the neurosurgery service. Conclusion: There has been an exponential increase in out of hours MRI scanning over the past decade. This is an expensive service requiring several on-call staff. Despite the addition of a second MRI magnet at our hospital, this demand has continued to increase. For future planning of services, increasing MRI availability will be necessary, possibly in the form of an extended working day and/or in acquiring additional MRI magnets.

A54
A survey of the prevalence of smoking and smoking cessation advice received by in patients in two teaching hospitals in Ireland
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BMC Proceedings 2015, 9(Suppl 1):A54
Background: Brief cessation advice from healthcare professionals significantly increases the likelihood of patients quitting smoking, yet patients are not routinely provided with this advice. Smoke-free Brief cessation advice from healthcare professionals significantly increases the likelihood of patients quitting smoking, yet patients are not routinely provided with this advice. Smoke-free hospital policies aim to protect individuals from the adverse effects of smoking, however it is not clear if it encourages patients to quit or doctors to give smoking cessation advice. The aim was to determine the prevalence of smoking and cessation advice received by in-patients in two teaching hospitals in Ireland, which have smoke-free hospital policies. We also compared data from one hospital from before and after the policy implementation.

Methods: This study surveyed 466 eligible in-patients, 260 in Beaumont hospital and 206 in Connolly hospital; assessing their smoking habits, and advice they received from healthcare professionals on smoking cessation.

Results: Smoking prevalence was higher in Connolly (28%) compared to Beaumont (17%). 26% of current smokers in Connolly had received smoking cessation advice from healthcare professionals. The before and after analysis of Beaumont (2011 vs. 2013) showed a reduction in smoking prevalence and an increase in cessation advice.

Conclusions: Smoke-free hospital policies play a role in decreasing the prevalence of in-patient smokers.

A55
Prevalence of Carpal Tunnel Syndrome (CTS) among medical laboratory staff at King Saud University Hospitals, KSA
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Background: Carpal tunnel syndrome (CTS) is a group of symptoms resulting from local compression of the median nerve at the wrist leading to subsequent functional impairment and local ischemia of the median nerve. Occupations that involve repetitive hand movements carry a great risk for developing CTS and laboratory occupations fall under this category. We decided to investigate in this topic due to its absence in the Saudi health literature. The aim of this study was to determine the prevalence of CTS in the laboratory workers of KSU hospitals by using self-administered Boston Carpal Tunnel Questionnaire. It was also intended to determine the most commonly reported symptoms, the important independent risk variables included in the development of CTS including age, sex, BMI, years of employment, work pattern, and working hours per week.

Methods: This is a quantitative observational cross-sectional study that was held in KSU hospitals’ laboratories with a total of 225 participants. A standardized questionnaire known as “Boston Carpal Tunnel Questionnaire (BCTQ)” was used for the assessment of symptoms severity and functional status in carpal tunnel syndrome. Data Analysis was made by IBM SPSS Statistics software version 21.0. For data interpretation, the total scores were classified into groups (mild, moderate & severe) using percentiles, and Chi-square test was used to observe the association between study categories and the independent outcome variables. The means were also compared using student’s t-test for independent samples.

Results: Out of the 225 participants, 57 were found to be severely symptomatic. The prevalence rate of the severely symptomatic participants was determined as 25.3%. Among the severely affected participants, females were more than males (58% > 42%) and the difference was statistically significant (p=0.045). Technicians affected (91.2) were more than attendants (8.8%) and the difference was statistically significant (p=0.042). There was statistically significant association between the dominant and affected hand (p=0.0001). Wrist pain was the leading reported symptom (85.2%).

Conclusions: The prevalence rate of CTS in KSU hospitals’ staff (25.3%) was close to was found in literature (21.5%). So, laboratory workers are at risk of developing CTS, especially females and technicians, with the dominant hand most likely to be affected. If decent educational and preventive efforts are not considered towards this population, further deterioration is expected to those already affected and newer cases will appear.

A56
The evaluation of prognostic value of serum tumor marker in ovarian tumors
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Background: Ovarian cancer still remains the deadliest cancer of the female reproductive tract. Unfortunately, most cases are diagnosed in the late stages of the disease. The most useful tumor marker in the detection of ovarian cancer is cancer antigen (CA) 125. The greatest problem of CA 125 determination is its lack of specificity. Aim To evaluate the clinicopathological features of ovarian tumors and their correlation with the serum markers like CA125 in detecting ovarian tumors.

Methods: A retrospective analysis of ovarian tumor patients, treated at Gynecology and Obstetric department in Saqr hospital between 2011-2013, was performed. All the socioepidemiological and clinicopathological features were retrieved from the patient’s files.

Results: Number of Cases: 45 All the 45 patients included in the study had benign ovarian masses. Age Range: 15-64 yrs, type of ovarian tumor percentage (%), Dermoid cyst (teratoma), 35.5 serous tumors, 33.1 Chocolate cyst, 13 Parovarian cyst, 13 Follicular cysts, 2.2 Malignancy, 2.2 Approximately 35.5% of the cases were mature cystic teratoma, followed by serous cystadenoma (33.1%). The right ovary was involved in 56.2%, the left ovary in 31.2% and bilateral ovaries were involved in 12.5%. The serum levels of CA125: The mean serum level was 90.5±99.5 (range 7.0-294).

Conclusions: The diagnostic value of serum CA125 in distinguishing a benign from a malignant ovarian mass is important, but the main limit of serum CA125 is that it may be high in benign diseases, especially in the reproductive age.

A57
Stress and social support systems among final year medical students of Medical University of Silesia
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Background: Medical education is tedious and takes both a physical and psychological toll on medical students. Stress could lead to burnout which research has shown that is prevalent among medical students and can lead to other significant dangers if it continues into residency and beyond [1]. Aims: Among potential interventions to prevent stress and its harmful effects among medical students, a good social support system is essential. Our aim is to assess support systems among different demographics of final year medical students of SUM.

Methods: Interviews and a self-administered anonymous survey of 55 final year medical students by a 2 part questionnaire assessing demographics and support system were carried out.

Results: 35 final year medical students responded equating to a response rate of 76%, 54% were male mirroring class demographics. The majority (69%) were more than 25 years old and unmarried (89%). We observed that majority of students relied on family, friends and classmates for support when stressed and very few relied on mentors, faculty and school administration for support.

Conclusions: The major support systems relied upon by the students has been identified and a void of support from mentors, faculty and school administration discovered. Further research for the cause of this might be helpful to distinguish between the lack of support provision or lack of use on the part of students. This is important as healthy support systems are necessary to cope with the stress ahead in the field of medical practice.

Reference
Aspirin resistance among the test cohort is 24.4%. These ed structures was performed with Rscript and DeepView in parallel. thus inhibiting its possibility to catalyze TMA oxidation. However, exposed residues are mutated in more cases, than buried. No clear impact on NADP binding efficacy and aggregation probability of mutated variants in comparison with normal FMO3 were determined. Analysis of three mutations (E240D, E158K, V257M) associated with high FMO3 activity showed that slight redistribution of local electrostatic potential near few conservative residues can increase catalytic activity, thus suggesting the direction for future drugs investigation. 

Conclusions: 1) Full-size structures of human normal and TMAU-associated FMO3 protein are obtained; 2) Most of TMAU-associated mutations possess local destabilizing effect on spatial structure; 3) NADP binding and aggregation tendency aren’t usually affected; 4) Surface-stabilizing ligands for FMO3 are potential drugs for TMAU treatment (next steps).

Background: At the Royal College of Surgeons in Ireland (RCSI) anatomy teaching is carried out during the preclinical years by using various modalities to maximize students learning. The purpose of this study is to assess how much did final year student retain from the basic clinical anatomy of the head and neck and to determine if reinforcement of anatomy is required throughout the medical school curriculum.

Methods: The study was carried out on 247 final year RCSI medical students. The students were asked to complete a multiple-choice quiz within 12 minutes. In addition, they were invited to fill in a short survey regarding their opinion on the anatomy curriculum.

Results: The response rate to the quiz and survey were 64.78% and 55.56%, respectively. Out of a maximum score of 15, the mean score achieved was 7.58 and the mode was 9. Using the mode as our acceptable standard; 41.25% of the class passed the quiz. Students scored highly on neck surface anatomy questions, while scored low on questions related to cranial and peripheral nerves; cervical vertebra; and scalp injury. The majority of the responders to the survey felt that anatomy taught in the preclinical years was clinical relevant and that it should be reinforced throughout the clinical years.

Conclusions: The knowledge of final year medical students of basic head and neck anatomy was acceptable, considering the time span between their preclinical and clinical years. However, the results highlight the need for reinforcement of relevant clinical anatomy throughout their clinical years of teaching.

Revealing the impact of 17 mutations of human FMO3 protein associated with trimethylaminuria on its local spatial properties: a bioinformatic approach

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Background: Trimethylaminuria (TMAU) is a rare metabolic disorder manifesting in enormous excretion of trimethylamine (TMA) with urea, sweat and breath that leads to unpleasant body odour similar to rotting fish. TMAU has a strong genetic basis: 18 mutations (associated with 17 amino acid substitutions or chain truncation) of flavin-containing monooxygenase 3 (FMO3) are now recognized as a causative factor of TMAU. Surprisingly, only few of them are related with active site structure, while the molecular potential and force-field energy distribution were fixed for few point mutations. All structures visualization was performed with PyMOL. Binding sites were identified with Q-Site Finder and SURFNET. List of mutations were taken from Zhou and Shephard paper. Structural analysis of FMO3 normal and TMAU-associated structures was performed with UCSF Chimera. Aggregation tendency was calculated with PASTA and TANGO. All structures visualization was performed with PyMOL.

Methods: Full-size modelling of normal FMO3 structure was performed with multiple template-based homology modelling and fragment threading techniques in MODELLER and FUGUE software. Point mutations were created with special MODELLER script and DeepView in parallel. Geometry optimization was performed with GROMOS96 force field. Binding sites were identified with Q-Site Finder and SURFNET. List of mutations were taken from Zhou and Shephard paper. Structural analysis of FMO3 normal and TMAU-associated structures was performed with UCSF Chimera. Aggregation tendency was calculated with PASTA and TANGO. All structures visualization was performed with PyMOL.

Results: Full-size structures of normal and 17 TMAU-associated FMO3 were obtained for the first time by homology modelling based on 4 templates and C-terminal domain threading. Significant changes in electrostatic potential and force-field energy distribution were fixed for few point mutations (e.g., R51G, E158K etc.). Disturbance of few conservative and functionally important residues environment were established for R51G, N61S, M66I, E308G, M434I etc. Nine point-mutations were found to destabilize binding pocket of FMO3 thus inhibiting its possibility to catalyze TMA oxidation. However, exposed residues are mutated in more cases, than buried. No clear impact on NADP binding efficacy and aggregation probability of mutated variants in comparison with normal FMO3 were determined. Analysis of three mutations (E240D, E158K, V257M) associated with high FMO3 activity showed that slight redistribution of local electrostatic potential near few conservative residues can increase catalytic activity, thus suggesting the direction for future drugs investigation.

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Aspirin resistance among a cohort of Sri Lankan patients

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Background: Aspirin is an effective anti-platelet agent with proven benefit in preventing atherothrombotic complications. However, resistance to aspirin is significantly associated with increased risk of death, cerebrovascular accident or myocardial infarction compared with aspirin sensitive patients (24% vs 10%, P=0.03) and is well documented in Western literature. It has hitherto not been established in Sri Lanka. Our aim was to estimate the prevalence of aspirin resistance in patients on low dose aspirin for primary or secondary prophylaxis and to ascertain if patients resistant to aspirin have detectable serum salicylic acid levels (SA).

Methods: Platelet aggregometry was performed with Adenosine diphosphate (ADP) and Arachidonic acid in 48 patients on aspirin 150mg daily and 12 normal controls. Serum Salicylic acid levels were also estimated using High Performance Liquid Chromatography (HPLC) on the same blood sample. Aspirin resistance was defined as a mean platelet aggregation of ≥70% with ADP and ≥20% with Arachidonic acid. Aspirin semi responders were defined as those having the above platelet aggregation levels in only one of the two reagents used. Aspirin responders do not show acceptable platelet aggregation with either of the reagents.

Results: Mean age of patients was 61 years (SD=9.26) with 64% females. 24.4% were aspirin resistant, 64.5% were semi responders and 11.1% were aspirin responders. All semi responders showed normal aggregation with Arachidonic Acid. Salicylic acid levels were successfully performed in only 32 patients. Salicylic acid levels of ≥0.01µg/L were detectable in 62.5% of aspirin resistant patients and 70.8% in responders.

Conclusions: Aspirin resistance among the test cohort is 24.4%. These patients are at greater risk of developing recurrent vascular events in spite of being on aspirin and may benefit by a dose increment. We suggest further studies with larger numbers of patients.

Should the basophil activation test be the gold standard in the diagnosis of food allergies?

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Background: The basophil activation test (BAT) is an in vitro test which allows to identify children with food allergies at the sensitization stage and clinical manifestations of atopic dermatitis/eczema (AD). The aim of our study was to observe the BAT in children with food allergies, optimize the diagnosis co-threading, other tests, and select an elimination diet. Early detection of sensitization and elimination of causative allergens can help prevent the progression of the disease into bronchial asthma in such children.

Methods: We investigated 89 children from 3 months to 12 years with FA experience and AD symptoms in varying severity. We used the BAT by

POSTER PRESENTATIONS

A58

Assessment of final year medical students knowledge of basic head and neck clinical anatomy

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A59

Revealing the impact of 17 mutations of human FMO3 protein associated with trimethylaminuria on its local spatial properties: a bioinformatic approach

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A60

Aspirin resistance among a cohort of Sri Lankan patients

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A61

Should the basophil activation test be the gold standard in the diagnosis of food allergies?

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flow cytometry (CD203C +), specific IgE, reaction of mast cell degranulation (RMCD) in rats, and the prick skin test.

Results: The level of spontaneous activation of basophils (SAB) it means basic expression of basophils, depended on the severity of AD (p <0.05) and did not depend on the period of the disease (recurrence or remission). The level of SAB, allergen-induced basophil activation was significantly higher in the polyvalent sensitization group than in the monovalent sensitization group. (p <0.05). We found positive basophil activation in 25% of specific IgE negativity, in 30% of RMCD negativity. Use of selection elimination diet based on the results achieved using BAT allowed us to achieve sustained remission in 80% of the patients.

Conclusions: BAT is a highly sensitive and accurate diagnostic method of sensitization in children with FAs which are manifested in the form of AD. Although accurate, it should not be used alone. Instead, it best used with other complementary tests for the clearest representation of each condition. Thus, the BAT should be recommended to help prescribe elimination diets for patients with FA.

A62 Primary brain tumours following breast cancer
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BMC Proceedings 2015, 9(Suppl 1):A62

Background: Primary brain tumours account for one of the top ten reasons for all cancer-related death. It has previously been shown that there is an increased risk of developing a primary brain tumour following a prior solid tumour in the case of bladder cancer, endometrial cancer, sarcoma and leukaemia. There is no data on whether there is an increased risk in developing primary CNS neoplasia following breast cancer.

Methods: Patient data was collected on all primary brain tumours diagnosed at Beaumont hospital between the years 2001-2013. This list of primary brain tumours was then cross-referenced with a set database of 4157 breast cancer patients. The result was then compared to the number we would expect in the average population over the same time period in a similar cohort that didn’t have breast cancer.

Results: We calculated that we would expect 6.48 patients in a cohort of 4157 of the average population of women aged 40-74 between the years 2001-2013. 7 patients in our cohort of 4157 breast cancer patients developed a subsequent primary brain tumour. Thus there isn’t a significant increase (relative risk 1.33, 95% confidence interval 0.46-3.83, p= 0.87) in the risk of acquiring a primary brain tumour in a patient that has had primary breast cancer.

Conclusions: There is no statistically significant increase in risk of developing a primary brain tumour following breast cancer. This is new information that hasn’t been reported before.

A63 Managing diabetes and its comorbidity: a challenge for primary care settings
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BMC Proceedings 2015, 9(Suppl 1):A63

Background: Diabetes is a major health care challenge in India [1]. Majority of diabetics depend on primary care settings for the management of their condition. Management of diabetes could be challenging for primary care provider owing to its co morbidities. Present exploratory study assessed the availability of resources at the primary health care facilities in Odisha, for managing diabetes as well as explored primary care physicians challenges and constraints in managing this condition.

Methods: Thirty primary care centres in Odisha (ten from urban, semi urban and rural each) were randomly selected. Evaluation of facilities provided at their level was assessed by a modified version of PCET (Primary Care Evaluation Tool) [2] and descriptive statistics was computed. Additionally two Focus Group Discussion with 12 physicians of the study group was done using Thematic framework approach.

Results: It was found that majority of centres attend to more than 5000 patient population (28 out of 30). Though all of them attended to diabetic patients in their practice area, none had special diabetes clinics. Majority (28 out of 30) made use of clinical guidelines in their practice. However with their record keeping system most of them were unable to generate a list of diabetics in their practice area (21 out of 30). Availability of IEC material was quite low (3 out of 30). None of the centres had physiotherapist or nutritionist but majority (28 out of 30) had a pharmacist who only dispensed medicines. Equipments for basic tests like blood sugar estimation were available in 5 centres. None had ophthalmoscope, X-Ray facilities or USG facilities. Only two had provision of oral hypoglycaemics. None had the system of immunization for diabetics. The FCD highlighted the constraints of physicians in diabetes management. Most diabetics were referred to higher centre due to inadequate laboratory services. Huge burden of consultations per day, led to shorter consultation time for evaluation and co morbidity management. Emphasis was laid on the need for CME and lucid clinical guidelines. It was also felt that low patient awareness and loss to follow up were a hindrance.

Conclusions: The primary care facilities need better resources and logistic support for management of diabetes and its complications. There is also a need for the capacity building of doctors through CME and IEC material which could be made available in these centres. Lack of human resources, laboratory facilities was major constraints. There is need for STP for managing diabetes and co morbidities specially conceptualised for primary care settings.

References