A1 The antibacterial effect of the combination of red raspberry concentrate and antibiotics on Staphylococcus aureus
Aleksandar Bokan1, Saša Vukmirović2, Deana Medić1,2
1University of Novi Sad, Faculty of Medicine Novi Sad, Hajduk Veljkova 3, Novi Sad 21000, Republic of Serbia; 2Institute of pharmacology, Toxicology and Clinic Pharmacology, Hajduk Veljkova 3, Novi Sad 21000, Republic of Serbia; 3Institute of Public Health of Vojvodina, Center for Microbiology, Futoksa 121, Novi Sad 21000, Republic of Serbia. BMC Proceedings 2015, 9(Suppl 7):A1

Background: The increasing presence of both methicillin-resistant isolates of Staphylococcus aureus (MRSA), and lately vancomycin-resistant Staphylococcus aureus (VRSA), requires pursuit of new antibiotics. This is achieved in several ways: by modification of existing antibiotics, by synthesis of new antibiotics or by empirical screening of, so far, unexamined compounds. Consumption of fresh or processed berries (raspberry, blackberry, strawberry, currant, cranberry and other berries) is considered exceptionally beneficial due to the potent antioxidant and antibacterial activity of their phenolic compounds. Having in mind high percentage of highly resistant bacterial strains of Staphylococcus aureus and antibacterial potency of red raspberries’ phenolic compounds, the goal of study was to investigate interactive effect of red raspberries concentrate and antibiotics on Staphylococcus aureus [1-4].

Methods: In the experiment we used: 1) absolute physicochemically unchanged, 100% natural raspberry juice, 2) clinical isolate of Staphylococcus aureus, 3) antibiotic discs for examination of bacterial susceptibility, 4) sterile 0.9% sodium-chloride and 5) Müller-Hinton agar. Testing the existence and type of interaction between the red raspberries’ concentrate and the antimicrobial drugs was performed in vitro using Kirby-Bauer disc diffusion method in accordance with CLSI guidelines.

Results: The results of our study clearly indicate the existence of synergism between penicillin, cefoxitin, tetracycline, ciprofloxacin and fusidic acid with red raspberries’ concentrate as the source of various phenolic compounds.

Conclusions: New classes of antibiotics are extremely necessary and flavonoids represent a potentially new group of antimicrobial substances that could potentiate the activity of conventional antibiotics.

References

A2 The relationship of invasive and non-invasive respiratory therapy to the risk of developing the Retinopathy of Prematurity (ROP)
Bolkhova Alina Sergeevna1, Khushelnički Anatoly Aleksandrovich1, Stepanova Ekaterina Vladimirovna1, Degterev Dmitri Nickolaevich1
1First Moscow State Medical University named after IM. Sechenov, Moscow, Russia; 2People’s Friendship University of Russia, Moscow, Russia; 3Scientific Center of obstetrics, gynaecology and perinatology named after academician V.I. Kulakov, Moscow, Russia. BMC Proceedings 2015, 9(Suppl 7):A2

Background: ROP occurs in 95% of babies weighing less than 1000 g, all cases that had proceeded to the third stage will cause serious complications or complete blindness [1]. The aim of the study was to evaluate the degree of invasive and noninvasive respiratory therapy affection on the frequency and severity of ROP in the group of risk.

Methods: Retrospective analysis of examination of 217 newborn of the risk group. (In Russian Federation all children under 35 weeks of gestation age or weighing below 2000 gr lie in the group of risk for ROP). Due to the development of Respiratory Distress Syndrome all children needed respiratory therapy on the first week of living. The patients were divided into 3 groups according to the kind of respiratory therapy received. 1st group (n=88) received noninvasive respiratory therapy with Nosal Continuous Airway Pressure, 2nd group (n=69) – noninvasive therapy with Biphasic, and 3rd group (n=62) – invasive respiratory therapy with Artificial Respiring Unit.

Results: In 1st group we observed 0 cases of ROP, in 2nd - 3 cases were diagnosed, but all of them had a fast regression afterwards, in 3rd group (n=62) – 20 children developed ROP, only 15 cases regressed and one child had to go through the laser coagulation of the retina vessels.

Conclusions: Changing from invasive to noninvasive forms of respiratory therapy may lead to significant decrease of the risk of ROP.

Reference

A3 A retrospective review of general paediatric inpatient deaths over time
Amanda Roth1, Jeremy Friedman2, Adam Rapoport3, Kim Widger3
1Royal College of Surgeons in Ireland, Dublin, Ireland; 2The Hospital for Sick Children, Toronto, Canada. BMC Proceedings 2015, 9(Suppl 7):A3

Background: To retrospectively review changes in the circumstances of general paediatric inpatient deaths at a tertiary hospital over three different time periods.

These abstracts are available online at http://www.biomedcentral.com/bmcproc/supplements/9/S7
Methods: Data was retrospectively collected for all patients who died on the General Paediatric Ward (the Ward) or in the Paediatric Intensive Care Unit (PICU) at this tertiary hospital, in the years 1998, 2005, and 2012. Patients who died in the PICU were considered to have a “general paediatric diagnosis” if their underlying condition or acute diagnosis would have normally resulted in admission to a General Paediatric Ward. The data elements collected were related to: demographic information about the child, health services data, information about provision and orders related to CPR at time of death and the involvement of palliative care services.

Results: 85 inpatients met the inclusion criteria; 35 in 1998, 27 in 2005, and 23 in 2012. Differences in location of death were noted across the three time periods; 94.3% of general paediatric patients died in the Paediatric Intensive Care Unit (PICU) in 1998; 59% died in the PICU in 2005, and 69.6% died in the PICU in 2012. The chronological age at which these children died decreased over the three time periods, varying from a median age of death of 5.96 years in 1998, to 4.38 years in 2012. The proportion of patients with ‘no Cardiopulmonary Resuscitation’ (no CPR) orders at the time of death increased over the 14 year period from 31% in 1998 to 87% in 2012. Similarly, the proportion of patients with palliative care involvement increased from 8.6% in 1998 to 73.9% in 2012.

Conclusions: The number of inpatient general paediatric deaths at this tertiary hospital has decreased from 1998 to 2012. A larger proportion of these deaths are occurring on the Wards rather than in the PICU over time. ‘No CPR’ orders and palliative care consultations are becoming more prevalent in these patients prior to death.

References

A4

Validating the expression of miRNAs in healthy controls and SLE patients and to predict possible gene targets

Amandeep Chughha, Seidean Smith, Caroline Jefferies

Department of Molecular and Cellular Therapeutics (MCT), Royal College of Surgeons in Ireland, Dublin, Ireland

BMC Proceedings 2015, 9(Suppl 7):A4

Background: Systemic Lupus Erythematosus (SLE) is a multisystem autoimmune connective tissue disease that has a strong female predominance (9:1) seen especially in women of child-bearing years [1]. Although the exact mechanisms of disease are not completely understood, the role of dysregulated microRNA (miRNA) has been implicated in the pathogenesis of SLE [2]. Clinically, the disease is unpredictable, with the current therapy for symptomatic patients associated with undesirable side effects and toxicity affecting multiple organs [3]. Therefore, in order to bridge the gap between disease and cure, an in depth understanding of disease pathogenesis is required to manufacture medications that tackle the underlying cause of the disease. In this study, we set out to validate differentially expressed miRNAs in SLE patient monocytes versus healthy controls, previously identified in a microRNA screen carried out in the group. Furthermore we aim to perform bioinformatics analysis to predict potential gene targets for these miRNAs that may play a role in the disease pathogenesis.

Methods: RNA was extracted from monocytes from SLE patients and healthy controls previously collected in the laboratory. Bioinformatics analysis was undertaken to identify potential genes targeted by miRNAs of interest. The primers specific to the miRNAs were designed and optimised following which gene induction of miRNAs was determined by PCR. In order to investigate the expression of miRNAs, densitometric analysis of the gel electrophoresis was determined.

Results: In the study, the expression of miRNA-107 and miRNA-132 were investigated. The expression of miRNA-107 was significantly greater in SLE patients than in healthy controls (p<0.00362), whilst there were no appreciable differences in miRNA-132 expression in SLE patients and healthy controls. SMURF1 and SOCS5 were identified as potential genes targeted by miRNA-107, however no significant change in expression in either genes were observed in SLE patients versus controls.

Conclusions: There was a significant increase in the expression levels of miRNA-107 in SLE patients, while no significant changes in miRNA-132 was demonstrated. Further investigation into potential gene targets for miR-107 is required in order to understand the pathological importance of dysregulation of this miRNA in SLE and its therapeutic implications.

References

A5

Young population awareness of head and neck cancer (HNC) risk factors, symptoms and prognosis – a pilot survey

Anna Krentowski1, Anna Skonieczny1, Elżbieta Sierko2

1Students' Scientific Association in the Department of Oncology, Medical University, Bialystok, Poland; 2Department of Oncology, Medical University, Bialystok, Poland

BMC Proceedings 2015, 9(Suppl 7):A5

Background: HNC is the sixth most common type of cancer in Europe, with over 150,000 new cases in 2012. It is usually recognized at an advanced clinical stage, when the survival rate is considerably lower, compared to patients diagnosed early. Main risk factors, tobacco and alcohol use, are usually present in young people, thus health education in this group is crucial. The aim of our study was to evaluate the level of HNC awareness among young population in North-Eastern Poland.

Methods: An anonymous questionnaire about HNC was conducted among 1665 people in the age of 18-35 years. Population consisted mainly of high school and university students. Respondents were asked about HNC risk factors, symptoms and prognosis.

Results: Eighty five percent of respondents had heard about HNC. The main source of information was the Internet (57%). Students of medical universities considered smoking (92%), alcohol (59%) and HPV infection (53%) main risk factors; other respondents indicated smoking (67%), stress (34%) and excessive sunbathing (32%). Almost all students knew that smoking causes lung cancer, whereas much less respondents realised that this risk factor causes also HNC (34%) and excessive sunbathing (32%). As much as ¼ of the young people were unaware of this risk factor causes also HNC. As much as ¼ of the young people were unaware of this risk factor causes also HNC.
population knew that early diagnosis of HNC is associated with 90% chance of cure.

**Conclusions:** Awareness about HNC among young people is disturbingly low. Students of non-medical schools and universities have little knowledge on risk factors and first symptoms of HNC. Extending the population further and including low-educated young people in the study would be reasonable. Increasing the number of educational campaigns would lead to earlier presentation, diagnosis and treatment.

### A6 Substrate composition and dimensionality direct osteocyte gene expression

*Amenah Dhannoon*, Robert Thomas Brady, Fergal O’Brien
Royal College of Surgeons in Ireland, Dublin, Ireland
*BMC Proceedings* 2015, 9(Suppl 7):A6

**Background:** Osteoporosis has become a major public health problem, it is characterised by loss of bone mass and architecture due to disturbance in bone remodelling. Most current treatments retard bone loss but have no stimulating effect on bone formation [1]. Osteocytes act as an orchestrator for bone modelling, and secrete the glycoprotein sclerostin which negatively regulates bone formation and is a potential novel drug target [2]. Due to difficulty of accessing and studying osteocytes in vitro, an osteocyte–like MLO-Y4 cell line was developed. However, these cells only secrete sclerostin in trace amounts [3]. The objective of this study was to develop a novel biomimetic environment that would stimulate MLO-Y4 to express the osteocyte specific Sost gene.

**Methods:** Four different compositions were seeded with MLO-Y4 cells and accommodated in two different cultures (3D scaffolds versus 2D films). After 5 days of culture, Sost gene expression was analysed using Real-time PCR in all groups and the data was normalised to a housekeeping gene (18s).

**Results:** There was a robust statistically significant increase in MLO-Y4 gene expression for Sost when cultured on a Collagen-Hydroxyapatite (HA) substrate compared to a Collagen-only substrate. Furthermore, the 3D dimensionality enhanced gene expression across all different compositions.

**Conclusions:** This study has demonstrated that scaffold composition and dimensionality has a significant influence upon regulation of MLO-Y4 gene expression. This also indicates that Sost gene is regulated by both composition and dimensionality. The ability to stimulate MLO-Y4 cell line to express Sost sufficiently will offer a precious tool for researchers to further study sclerostin secretion, identify novel regulators of Sost gene expression and investigate them to develop new therapeutic agents that may offer advantage over the currently available treatments for osteoporosis.

### A7 Dysregulated neutrophil function in individuals with alpha-1 antitrypsin deficiency caused by modified membrane cholesterol content

*Bair Jundt*, Michelle White, Noreen Lacey, Noel G McElvaney, Emer Reeves
Dept. of Medicine, Respiratory Research, Beaumont Hospital, Dublin 9, Ireland
*BMC Proceedings* 2015, 9(Suppl 7):A7

**Background:** Individuals with alpha-1 antitrypsin (AAT) deficiency (AATD) are predisposed to early-onset emphysema and neutrophils are the primary effector cells responsible for the pathological manifestations of AATD lung disease. As AAT interacts directly with the circulating neutrophil membrane [1], the question that this project addressed was: are AATD neutrophils structurally and functionally altered? The aim of this study was to explore a link between disrupted membrane structure and impaired trafficking of cholesterol in AATD neutrophils.

**Methods:** Circulating neutrophils were purified from blood of patients with AATD and from healthy control individuals (n=7). Membranes and cytosols were isolated from neutrophils by sucrose-gradient ultracentrifugation. Cholesterol and calcium levels were fluorometric quantified and calpain levels measured using a calpain activity assay. Caveolin-1 expression was examined by Western blot analysis. Statistical comparisons were performed by Student’s t-test.

**Results:** Neutrophil cytosols of AATD individuals had increased calcium concentrations (n=7, p=0.04) and activation of the calcium dependent protease calpain (n=7, p=0.01). Furthermore, levels of the cholesterol trafficking protein caveolin-1 were significantly lower in AATD neutrophil cytosols (n=6, p=0.01) leading to significantly decreased membrane cholesterol content when compared to healthy control cells (n=5, p=0.045).

**Conclusions:** In summary, our findings have demonstrated for the first time increased calcium, increased calpain activity causing proteolytic cleavage of caveolin-1, and decreased membrane cholesterol content of AATD neutrophils. This novel data may in part explain the dysregulated activity of this innate immune cell in AATD.

**Reference**

### A8 An audit of knowledge, attitude and sexual practise of HIV positive patients in Beaumont Hospital

*David McMahon*,1 Samuel McConkey1,2
1Royal College of Surgeons in Ireland, Dublin 2, Ireland; 2Beaumont Hospital, Dublin 9, Ireland
*BMC Proceedings* 2015, 9(Suppl 7):A8

**Background:** This study explores the effectiveness of information provision in the HIV clinic in Beaumont Hospital, determining whether the patients understand the information provided and change their beliefs and practices as a result.

**Methods:** Patients were asked a series of questions in a structured interview. The information was then analysed on a population basis by ethnicity and viral load.

**Results:** 684 questions were asked to ascertain the patient’s knowledge of HIV transmission with an 82% (n=559) rate of correct answers. 72% (n=37) of those who had sex in the past year in this study stated that they had not had sex without a condom in that period.

**Conclusions:** There is room for improvement in knowledge of transmission in the clinic. An 8% gap existed between Irish patients (89%) and all other patients (81%) in the area of HIV transmission. The understanding that antiretroviral drugs can aid in preventing HIV infection is lacking in many patients. Many patients have changed their sexual practices while attending the clinic to protect both themselves and their partners.

### A9 Profiling Micro-RNA expression in patients with Primary Sjogrens Syndrome – contribution to disease pathogenesis

*Rena Al-Zubiady*,1 Joan Ní Ghabhann1,2, Quinina Wilson1,3, Conor C Murphy1,3
1Molecular and Cellular Therapeutics and RCSI Research Institute, Royal College of Surgeons in Ireland, Dublin 2, Ireland; 2Department of Ophthalmology, Royal College of Surgeons in Ireland, Dublin 2, Ireland; 3Department of Ophthalmology, Royal Victoria Eye and Ear Hospital, Dublin 2, Ireland
*BMC Proceedings* 2015, 9(Suppl 7):A9

**Background:** Sjogrens syndrome (SS) is a chronic autoimmune disorder, characterised by lymphocytic infiltration resulting in exocrine gland destruction and other extra-glandular manifestations [1]. Currently there is no definitive diagnostic test, and the immuno-pathology is not fully understood. Recently focus has shifted to investigating microRNAs (miRs) in an effort to understand the mechanisms contributing to disease pathogenesis. miRs are short non-coding RNA sequences, which regulate gene expression post-transcriptionally [2]. Of note, miRs have been identified as key regulators of immune function in a variety of autoimmune conditions [2]. The hypothesis of this project is that alterations in expression of specific miRs which regulate genes relating to inflammation and immunity may play a role in the pathology of the disease.
A microRNA screen had been conducted in peripheral blood mononuclear cells (PBMCs) from healthy controls and SS patients. From this screen a set of microRNAs were analysed by bioinformatics using online platforms including miRWalk, MiRDB and miRanda Tools. Primers were designed and optimised by PCR for the miRs and their predicted gene targets. As part of ongoing work in the lab PBMCs were isolated and transfected with a sequence that mimics miR-155 (a pro-inflammatory miR). The effect miR-155 on target genes was analysed by qPCR.

Results: Bio-informatics studies identified several novel miRs whose expression is altered in SS patients compared to healthy controls. Two miRs that were focused on were down-regulated in the patient sample and are hsa-miR-132-3p and hsa-miR-4535 and their target genes are ESRRG (Estrogen related receptor gamma) and ATRN (Attractin) respectively and one up-regulated miR which is Hsa-miR-185-3p and its target gene is IRF5 (Interferon regulatory factor 5). Primers for these novel miRs and gene targets were optimised.

Conclusions: Since these specific miRs have altered expression in SS patients, and have a direct effect on inflammatory genes, this indicates that these miRs may have biomarker potential and further study of these miRs might increase our understanding of the underlying pathology of Sjogren’s syndrome and other autoimmune diseases.

References

A10
Combining systems biology models of apoptosis provides superior predictions of the responsiveness of melanoma cells to cell death inducing drugs
Paul Curtayne1, Maximilian Wuerstle2, Andreas Lindner3, Jochen Prehn4, Markus Rehm5
1Royal College of Surgeons in Ireland, Dublin, Ireland; 2Centre for Systems Medicine, Dept of Physiology and Medical Physics, Royal College of Surgeons in Ireland, Dublin, Ireland
BMC Proceedings 2013, 9(Suppl 7):A10

Background: Key to the clinical management of melanoma is the development of new diagnostic tools that predict individual patient prognosis and select from potential treatments those which may be effective. Identifying individual biomarkers in tumour cells to predict susceptibility to apoptotic cell death has thus far been largely unsuccessful, as apoptosis pathways show a high degree of signalling redundancy.

Methods: DR_MOMP [1] and ApoptoCell [2] are mathematical systems biology models of the mitochondrial outer membrane permeabilisation and execution stages of the apoptosis pathway, respectively, that take into account the complex nature of apoptosis regulation. Both models use a network of ordinary differential equations representing measured protein concentrations and reaction kinetics. In this study we combine these models and compare model predictions to experimental measurements of cell death in a range of melanoma cell-lines that were treated with different cytotoxic agents.

Results: The combined approach is found to outperform either individual model in predicting strong and weak responses to treatment with cell death inducing drugs.

Conclusions: This work may provide a basis for the development of improved prediction tools for clinical treatment outcomes and treatment selection in melanoma.

References

A11
siRNA-mediated targeting of the RNA-dependent RNA polymerase in the Norovirus genome
Rachel Mac Carr1, Sam McConnell, Fiona O’Brien
Royal College of Surgeons in Ireland, Dublin, Ireland
BMC Proceedings 2015, 9(Suppl 7):A11

Background: Human noroviruses are a major cause of epidemic and sporadic gastroenteritis worldwide and can chronically infect immunocompromised patients. Efforts to develop effective vaccines and antivirals have been hindered by the uncultivable nature and extreme genetic diversity of human noroviruses [1]. Previous therapies have focused on targeting nucleases and structural proteins. The norovirus RNA genome or viral transcripts also constitute an important target to inhibit the replication of norovirus. Finding a conserved component of the Norovirus genome would make it an ideal target that could overcome the genetic diversity of strains [2].

Gene-based therapy is the intentional modulation of gene expression in specific cells to treat pathological conditions. This modulation is accomplished by introducing exogenous nucleic acids such as small interfering RNA (siRNA). Given the large size and negative charge of this macromolecule, its delivery is typically mediated by carriers or vectors. Targeting the gastrointestinal (GI) tract represents a promising strategy for local or systemic delivery of gene-based therapeutics [3].

Methods: A common Norovirus Genotype to the Irish population was identified. Conserved components of the Norovirus genome were isolated for targeted antiviral therapy. BLAST searches and homology searches were conducted on these sequences identified.

A literature review was conducted on siRNA-mediated inhibition techniques and its application to the gastrointestinal tract. A review was also conducted on the recent advances in material sciences, nanotechnology and nucleic acid chemistry that have yielded promising non-viral delivery systems.

Results: The Sydney 2012 genotype was found to be the most prevalent virus strain in Ireland and the RNA dependant RNA polymerase (RdRp) was found to be a conserved component. Two candidate sequences of the RdRp were identified for siRNA mediated inhibition.

Conclusions: The development of a Nano-carrier for siRNA delivery via the GI tract would enable localised therapy for Norovirus. Gene therapy via this route has many advantages, including non-invasive access and the versatility to treat local diseases, such as Norovirus. However, the intestine presents several distinct barriers and, therefore, the design of robust non-viral delivery systems is key to future success. Several non-viral delivery strategies have provided evidence of activity in vivo [4,5]. This report reviews the possibility of siRNA-mediated inhibition of the RNA norovirus genome and the challenges that an oral gastrointestinal-delivery system will face.

References

A12
Investigating the Irish brain drain: factors influencing migration intentions among medical students
Kevin Kitt1, Pishoy Gouda1, David S Evans2, Deirdre Goggin3, Deirdre McGrath4, Jason Last5, Martina Hennessy5, Richard Armett6, Siun O’Flynn6, Fidelma Dunne6, Diarmuid O’Donovan7
1National University of Ireland, Galway, Ireland; 2Senior Research Officer, Department of Public Health, Galway, Ireland; 3Assistant Staff Officer, Department of Public Health, Galway, Ireland; 4Director of Education,
Background: Ireland has the highest level of medical emigration in Europe with an increasing demand for physicians worldwide [1,2]. This has received considerable public and political interest. However, few studies have described the migration intentions of medical students at the undergraduate level [3]. Our study aimed to describe the migration intentions of Irish medical students by nationality and identify unique factors, “push factors”, that influence their decisions.

Methods: Cross-sectional online survey of medical students in Ireland. Pearson’s Chi square was utilised to determine the significance of differences in migration intentions and factors influencing migration. Free text data was thematically analysed.

Results: Of 2273 respondents, 67% were Irish, 5.3% were from other EU countries and 27.8% were from non-EU countries. 88% of Irish students identified that they were definitely or contemplating going abroad following graduation/intern year, compared to 80% of non-EU students and 88% of other EU students (P<0.001). Training and career aspects, personal development and financial reasons were identified as key “push” factors influencing migration intentions.

Conclusions: It would be expected that a large proportion of EU and non-EU students would migrate from Ireland following training. However, it is alarming that the intention to migrate is significantly greater among Irish students than non-EU students. As eight out of ten of all students were not significantly associated with less IBT.

A14

Manometric and demographic predictors of incomplete bolus transit in patients diagnosed with ineffective esophageal motility

Sarah Pradhan1, Michelle Bureia, Milli Gupta, Michael Curley2, Lynn Wilsack2, Christopher Andrews2

1Royal College of Surgeons in Ireland, Dublin, Ireland; 2University of Calgary, Calgary, Canada

BMC Proceedings 2015; 9(Suppl 7):A14

Background: Ineffective esophageal motility (IEM), or frequent failed peristalsis in the Chicago Classification, is a common motility abnormality describing a non-specific manometric pattern of peristaltic failure. With the addition of multichannel intraluminal impedance technology to high resolution esophageal manometry (HREM), evaluation of bolus transit simultaneously with esophageal contraction is possible. However, manometric predictors of incomplete bolus transit (IBT) in the setting of IEM have not been fully characterized.

Methods: REB-approved retrospective chart review of patients diagnosed with IEM at a regional gut motility centre. All subjects were clinically assessed prior to HREM with a detailed history containing the patient’s primary complaints, other pertinent symptoms and demographic information. HREM with impedance studies (Given Imaging, Inc) were performed by standard protocol. Summary (averaged) data from each patient was compared. To examine which manometric variables best predicted the percentage of swallows with incomplete bolus transit for any given patient, a multiple linear regression was performed using selected variables, and adjusted for age and gender (SPSS 21). All tests were two-sided and significance was set at the 95% level.

Results: 230 patients (130 female; mean age 52 yr; range 18-82 yr) with a manometric diagnosis of IEM were included. The primary complaints of patients included dysphagia (33.9%), heartburn/reflux (33.0%), chest pain (11.7%), other (10.9%), and cough (8.7%). Many patients had more than one symptom; however there were no significant differences in baseline characteristics across primary symptom groups (data not shown). The multiple regression model fit was highly significant (F=10.14, 9 df, p<0.001) with an adjusted r square of 0.373. In the model, decreasing proportions of peristaltic contractions correlated significantly with decreased bolus transit (ie higher percentage of incomplete bolus transit). Similarly, higher intrabolus pressure correlated significantly with higher percentages of incomplete bolus transit. The remainder of the manometric variables were not significantly associated with IET. Gender was not significant but increasing age was associated with less IET.

Conclusions: As expected, peristaltic contractions predict adequate bolus transit in aggregate data, while increased intrabolus pressure predicted incomplete bolus transit. Further questions being evaluated in this study sample include effects of medications and connective tissue disorders on HREM and bolus transit variables in the setting of IEM.
A15
Antimicrobial prescribing in patients admitted through the emergency department of connolly hospital
Lauren Messer1,*, Bernie Love2, esghan O'Neill1,4
1Royal College of Surgeons in Ireland, Dublin, Ireland; 2Department of Pharmacy, Connolly Hospital Blanchardstown, Dublin, Ireland; 3Department of Microbiology, Connolly Hospital Blanchardstown, Dublin, Ireland; 4Department of Clinical Microbiology, Royal College of Surgeons in Ireland, Dublin, Ireland
BMC Proceedings 2015, 9(Suppl 7):A15

Background: Assessment of antibiotic prescribing is an important component of antimicrobial stewardship for the prevention of the misuse of antibiotics [1]. The aim of this study was to assess the prescribed antibiotics given to patients admitted through the Emergency Department (ED) of Connolly Hospital Blanchardstown (CHB) for compliance with the current CHB Guidelines for the use of Antimicrobials (2).

Methods: Antibiotics prescribed to patients admitted through the ED of CHB, over a three-week period in June - July 2014, were assessed for compliance with guidelines according to the documented indication for treatment. Data was obtained from patient charts and drug kardexes. Antibiotics prescribed by the ED and the subsequent antibiotics prescribed by the admitting team were recorded and evaluated for compliance with CHB antibiotic guidelines.

Results: 119 patients admitted through the ED in the study period were evaluated; of these, 24 patients (20%) were prescribed an antibiotic and included in the audit. 73% of the prescriptions given by the ED were compliant with the current CHB Guidelines for the use of Antibacterials. 88% of the subsequent prescriptions given by the admitting medical team were compliant with guidelines and 77% of the subsequent prescriptions given by the admitting surgical team were compliant with guidelines. Only 20% of community acquired lower respiratory tract infection (CA-LRTI) cases had a CURB-65 score calculated in correlation with antibiotic prescription. All non-compliance was due to choice of antibiotic.

Conclusions: The majority of patients prescribed antibiotics admitted to CHB through the ED were commenced on antibiotics compliant with CHB guidelines with appropriate documentation and dose. There is, however, improvement required to raise this level of compliance and the results from this audit will form the basis for further prescriber education.

References
2. Guidelines for the Use of Antibiotics, Connolly Hospital Blanchardstown. 4 2012.

A16
A review of the diagnosis and management of hyponatraemia in connolly hospital: an audit of current practice and the construction of a clinical aid for the diagnosis and treatment of hyponatraemia
Neil McAlliffe1,*, Seamus Screan1,2
1Royal College of Surgeons in Ireland, Dublin, Ireland; 2Connolly Hospital Blanchardstown, Dublin, Ireland
BMC Proceedings 2015, 9(Suppl 7):A16

Background: Hyponatraemia is the most common example of body fluid and electrolyte imbalance encountered in clinical practice, and is associated with increased mortality, morbidity and length of hospital stay in patients [1]. In spite of this, the diagnosis and management of hyponatraemia remains inconsistent as clinicians adopt a broad range of hospital- and specialty-specific approaches [1, 2]. In light of this observed inconsistency, the objectives of the present project were: (i) To audit all patients admitted to Connolly Hospital Blanchardstown (CHB) Emergency Department (ED) with hyponatraemia (<135 mmol/L) over a 14 day period. (ii) Record the diagnostic and management methods employed, comparing them with recent guidelines published by the European Society of Endocrinology (ESE). (iii) To construct a clinical aid for the diagnosis and treatment of hyponatraemia, specific to CHB.

Methods: The records of all patients admitted to the ED over a 14 day period (N= 426) were studied. Those presenting with hyponatraemia (serum sodium <135 mmol/L) upon initial measurement were identified and their lab results and patient files reviewed.

Results: Hyponatraemia (< 135 mmol/L) was observed in 10.7% of admitted patients (n = 46). Sex: 12-34; MF: Age: Mean : 63.4; Range: [16 – 98] on initial measurement. Of these, 63% had mild (130-135 mmol/L), 19.6% moderate (125-129) and 17.4% profound (<125) hyponatraemia respectively. In 41% of cases (18/44) inappropriate or insufficient diagnostic methods were utilised, when compared with the ESE guidelines. Blood glucose was measured in 69.5% (32/46) of patients, 32.6% (15/46) had Thyroid Function Tests and 17.3% (8/46) had Serum Cortisol measured. In 9% of cases (4/44) the management employed was inconsistent with the guidelines, in addition, 2 incidences (4.5%) of rapid overcorrection of sodium were observed (>10 mmol/L for the first 24 hours and >8 for any 24 hours thereafter).

Conclusions: Analysis of the data revealed that while the management of hyponatrexic patients was largely consistent with ESE guidelines, the diagnostic procedures in many cases were not. These results confirm the need for a diagnostic and management algorithm in CHB, and given the consistency of results across other institutions, the implementation of ESE guidelines in other centres may yield improved patient care and outcomes.

References

A17
Osteoporosis-osteopenia syndrome in children with transfusion dependent thalassemia
Zhi-Min Ong1,*, Wai Cheng Foong2, Seoh Leng Yeo3, Angelene Aing Chee Yeo1
1Royal College of Surgeons in Ireland, Dublin, Ireland; 2Department of Pediatrics, Penang Medical College, Penang, Malaysia; 3Department of Pediatrics, Hospital Pulau Pinang, Penang, Malaysia
BMC Proceedings 2015, 9(Suppl 7):A17

Background: Osteoporosis-osteopenia syndrome (OOS) is found in more than 50% of thalassemia patients worldwide [1,2]. Despite appropriate management, thalassemics continue to exhibit a decrease in bone mass due to the multifactorial pathogenesis of OOS in thalassemia [3]. Therefore, this study aims to obtain an insight on the thalassemia patients' perception of OOS and possible lifestyle contributing factors.

Methods: 64 regularly transfused patients from 2 major Thalassaemia Clinics in Penang aged 10 years and above participated in a 6-week cross-sectional study using a self-administered questionnaire. The questionnaire addressed lifestyle factors (exercise, diet), awareness and symptoms of bone problems. Bone profile information (serum levels of calcium, phosphate, alkaline phosphatase (ALP), 25-hydroxyvitamin D (25(OH)D), and Bone Mineral Density T-scores (BMD)) from patients' records was documented. OOS was considered based on either BMD (Lumbar and >8 for any 24 hours thereafter). Of the available results, 87.5% had low 25(OH)D and 86.2% had low BMD. Sample size was 64 patients, serum calcium and phosphate levels were normal while the mean ALP was 164mmol/L. A better understanding on OOS reduced the odds of having symptomatic bone problems. A p-value of <0.05 is taken as significant.

Results: 25% of patients had good understanding of OOS in thalassemia, 51.6% were symptomatic, namely 20.3% had history of bone pain or fracture and 42.2% had heights below the 5th percentile. 81.2% exercised frequently and 65.6% consumed low intake of dairy products. Only 64% of patients had either one or both BMD and VitD results. Of the available results, 87.5% had low VitD and 86.2% had low BMD. Sample size was 64 patients, serum calcium and phosphate levels were normal while the mean ALP was 164mmol/L. A better understanding on OOS reduced the odds of having symptomatic bone problems, however this was not significant (OR=0.92; p=0.05).

Conclusion: Low-level VitD and BMD results were detected in over 80% of patients who had undergone an OOS diagnostic investigation. This is consistent with the current literature [1,2]. Many were unaware of OOS.
and the importance of dairy intake. This suggests that OOS is not well known. The results of this study were limited to the patient’s ability to answer the questionnaire and the design of the questionnaire. T-scores were reported instead of Z-scores, which would give a better reflection of OOS in adolescents [4]. ALP could also be affected by other factors [5,6]. This study has shown the presence of OOS and its risk among the Penang adolescent thalassemia patients. Some were symptomatic. Many were unaware of OOS and took minimal dietary precaution. This calls for better education about OOS, its detection and prevention for thalassemia patients and health-care workers.

References


A18

The variation in the self-perceived quality of life and health care amongst smokers, passive smokers, ex-smokers and non-smokers in Canada

Samy Beshay1,2, Hany Beshay2

1Royal College of Surgeons: In Ireland, Dublin, Ireland, 2Terry Fox Medical Centre, Mississauga, Ontario, Canada

BMC Proceedings 2015, 9(Suppl 7):A18

Background: In 2012 nearly 20% of Canadians aged 12 and above had stated they smoked tobacco frequently, costing the health care system over $4.4 billion in health related illnesses. The aim of this study was to assess degrees of tobacco inhalation of smokers, non-smokers, ex-smokers, passive smokers and current smokers and their perceived quality of life and health.

Methods: The survey was conducted in the waiting room of two medical walk-in-clinics. The questionnaire comprised of four main aspects including age of the patient, identify themselves as a frequent smoker, a non-smoker (passive) who is regularly exposed to smoke, a past (ex-) smoker and a non-smoker who is not regularly exposed to tobacco smoke. Valid consent was obtained from the patients and patients under the age of 18 were not included in the study.

Results: A total of 387 patients completed the survey including 198 non-smokers, 83 passive smokers, 51 ex-smokers and 55 current smokers. The oldest group was the ex-smokers of a mean age of 52.6 years and the youngest was the smokers at 36.6 years (< 0.001). In between were the passive smokers at 43.6 years and non-smokers at 48.2 years (p = 0.002).

Conclusion: This research found that current smokers have a persistently lower self-reported quality of life and health care as compared with the other groups. It is also evident that patients who quit smoking do not suffer a loss in quality of life nor health compared to non-smokers. In addition, this research indicates that smoking not only impacts a patient’s health, but their overall Qol as well.

A20

Complex comorbidity and adherence to therapy for chronic kidney disease: disease perceptions & adherence in patients with comorbid HIV


BMC Proceedings 2015, 9(Suppl 7):A20

Background: In the light of an aging HIV population and improved HIV treatment, Chronic Kidney Disease (CKD) has become a common contributor to morbidity and mortality. Despite that the management of CKD in HIV patients is a growing priority, little is known about the impact of HIV infection on CKD therapy adherence [1]. To investigate adherence to CKD medications and antiretroviral (ARV) medications in patients with co-morbid HIV infection and CKD - in order to identify modifiable predictors of dual adherence, focusing on illness representation and medication beliefs.

Methods: This is a qualitative cross-sectional study that prospectively measures the relationship between disease perceptions and adherence using self-report instruments and the electronic Medication Event Monitoring System (MEMS).
HIV viral loads were used as surrogate markers to validate self-reported adherence to ARV medications. Depression, self-efficacy, alcohol and substance abuse and health literacy were assessed [2]. 20 well-characterized patients with CKD/ESRD and HIV were recruited. Institutional Review Board (IRB) approval was granted. Consent and confidentiality were protected under the Health Insurance Portability and Accountability Act (HIPAA).

Results: (I) Demographics Data: Gender, language, ethnicity, race, education, income marital status and disease precedence did not affect adherence. Higher comorbidity and pill burden correlated with dual non-adherence. (II) Adherence Data: 65% of participants reported dual adherence, 15% reported mono-adherence and 20% reported non-adherence. ARV self-reported adherence correlated with viral load and CD4 + counts. (III) Barriers & Facilitators of Adherence: Higher self-efficacy, care satisfaction and trust in physician correlated with adherence. Depression, smoking, psychiatric illness, alcohol or substance abuse correlated with dual non-adherence. (IV) HIV & CKD Illness Perceptions: Negative disease perceptions such as stigma and guilt correlated with non-adherence. (V) Medication Beliefs: Negative medication beliefs were more prevalent among ARV non-adherent patients. Adherence was higher in patients that reported better understanding of disease and medication.

Conclusion: The majority of participants perceived CKD to be their main health concern possibly because CKD improvement requires a combination of lifestyle modifications and medication adherence [3].

References

A22
Preparing Kaempferol Nanosuspension (KNS) using High Pressure Homogenization (HPH) technique
Yew Sheng Qian1, Ravindran Hari Kumar2, Venkata Srikanth Meka1, Senthil Rajan Dharmalingam1
1International Medical University, Kuala Lumpur, Malaysia; 2University Putra, Selangor, Malaysia
BMC Proceedings 2015, 9(Suppl 7):A22

Background: During the last decades, researchers have provided a plethora of therapeutic uses of kaempferol, including anti-cancer, anti-inflammatory, neuroprotective, anti-oxidative and anti-oestrogenic activities, making kaempferol a valuable compound [1]. However, being a poor water-soluble compound, kaempferol often has insufficient solubility and bioavailability [2].To find a solution for this limitation, this research project mainly focuses on formulating a kaempferol nanosuspension (KNS) using High Pressure Homogenisation (HPH), followed by performing physiological characterization. Kaempferol nanosuspensions are supposed to have a better bioavailability in animal models or even human subjects in future experiments, thereby reducing oral drug dosage required by consumers.

Methods: A weighed quantity of pure kaempferol (1%w/v) was dispersed in ultrapure water. The mixture had undergone magnetic stirring at 3000rpm for 30 mins. Then the mixture was sonicated using an ultrasonic probe sonicator. The amplitude was set at 100% for 1 minute. Finally, the mixture was homogenised by a high pressure homogeniser at 500 Bar, 1100 Bar and 1700 Bar for 10, 20 and 20 cycles respectively. The particle size, chemical and physical characteristics of kaempferol nanosuspension being produced was compared with that of pure kaempferol. The characterization techniques include Differential Scanning Calorimetry, X-ray Diffraction, Transmission Electron Microscopy and Fourier Transform Infrared Spectroscopy. Data was expressed as mean ±s.E.M. Significance levels for comparison.

Results: The KNS produced by HPH undergone a significant reduction in particle size (from 2μm to 400nm), but at the same time, maintaining its original chemical and physical characteristics, suggesting that this nanosized kaempferol has similar therapeutic effects as the pure drug.

Conclusions: Nanosuspensions produced by HPH represent an optimal solution for many poorly soluble substances and, therefore, they are still considered as a formulation of first choice due to the simplicity of the system.

References

A23
Case study of pancreas-preserving enucleation in the treatment of isolated pancreatic metastases of renal cell carcinoma
Toby D’Cruz1, JS Wong2
1School of Medicine and Medical Sciences, University College Dublin, Dublin, Republic of Ireland; 2Singapore General Hospital, Singapore
BMC Proceedings 2015, 9(Suppl 7):A23

Background: Pancreatic metastases are rare, accounting for 2.8% of cases in RCC, occurring as a result of haematogenous spread to the pancreas. High affinity of some renal cancer cells for the pancreatic parenchyma present solely as isolated pancreatic metastases. Literature reviews have highlighted that aggressive surgery for isolated pancreatic metastasis has been shown to increase 5 year survival rates
untto 60%; particularly nephrectomy & metastasectomy with adjuvant therapy.

The objective of this case study was to identify the benefits of pancreas-preserving enucleation in treatment of isolated pancreatic RCC metastases over traditional pancreatic resections.

**Report:** Patient X was identified as a candidate for this case report. Mr X. is a 77 year old patient with diabetes mellitus, presented with a 2 day history of frank haematuria & weight loss of 3kg over 6 months with no associated fever, flank pain or dysuria. CT KUB revealed lobulated soft tissue density in the right kidney, suspicious for a tumour. Further staging investigations of FET TAP demonstrated a small enhancing nodule in pancreatic body confirmed as pancreatic metastasis with EUA FNA. The patient subsequently underwent Open Right Radical Nephrectomy with Enucleation of Pancreatic Metastasis.

**Discussion:** Comparisons drawn between Pancreatic-sparing Enucleations and standard resection (Complete Pancreatectomy) explore variations in surgical challenges & post-operative complications. While there has been no difference in morbidity and recurrence compared to complete pancreatectomy; there has been significant reduction in post-operative diabetes mellitus.

**Conclusions:** Pancreatic resections are associated with high rates of morbidity and mortality. A reduction in operative risk following pancreatic surgery have been demonstrated, in recent times. As such, Pancreas-sparing Enucleation & Enucleo-resection has been considered a worthy option. Preservation of pancreatic tissue allows for better quality of life without diabetes mellitus.

**Consent to publish:** The patient had signed a written consent for publication of this abstract on Pancreatic Metastases.

**References**


**A25**

**The role of BH3-only protein Bmf in the pathogenesis of dominant negative hepatocyte nuclear factor-1β-induced mature-onset diabetes of the young in transgenic mice**

Fahd Alkhalfiah1, Shona L. Pfeiffer1, Luise Halang1, Heiko Dussmann2, Jochen H M Prehren1

1School of Medicine, Royal College of Surgeons in Ireland, Dublin, Ireland
2Department of Physiology and Medical Physics, Royal College of Surgeons in Ireland, 123 St. Stephen’s Green, Dublin 2, Ireland

**BMC Proceedings 2015, 9(Suppl 7):A25**

**Introduction:** Maturity Onset Diabetes of the Young 3 (MODY3) is the most common monogenic form of diabetes, characterized by early age of onset (before the age of 25), autosomal dominant transmission and severe defect in insulin secretion [1,2]. MODY accounts for 2.5%-5% of Non-Insulin Dependent Diabetes Mellitus (NIDDM) cases, with MODY3 identified as the most common and severe form, accounting for 65% of all MODY cases and results from loss of function mutations of the transcription factor Hepatocyte Nuclear Factor-1α (HNF1α). As a result of this, pancreatic islets show reduction in glucose-stimulated insulin secretion response and in beta cell mass, hallmarks of MODY3. Previous work in this laboratory has shown that induction of dominant negative mutant-HNF1α expression results in bioenergetic stress, activation of AMPK and induction of pro-apoptotic BH3-only family protein, Bmf [3].

**Methods:** To study the role of Bmf (Bcl-2 modifying factor) in the pathogenesis of MODY3, immunohistochemical staining of male and female pancreatic islets for insulin- and glucagon-positive expression
utilising confocal microscopy followed by Image J analysis were used to investigate the effect of bmf gene expression knockout on beta cell mass and islet organisation in a transgenic mouse model of MODY3.

**Results:** Bmf gene expression knockout was observed to significantly increase beta cell mass in DN-HNF1a-expressing transgenic male pancreases (p<0.04) but had no observable effect on transgenic female pancreas. Surprisingly, islet disorganisation was seen in both male and female transgenic mice and was not rescued by bmf knockout.

**Conclusions:** Data generated from this study indicate a possible role for Bmf in beta cell mass reduction and thereby the pathogenesis of MODY3 but demonstrates no effect on islet organisation. These data can be built upon by further research to examine in greater detail how Bmf contributes to the characteristic loss of beta cell mass in MODY3 and in mediating DNHNF1a-induced apoptosis.

**References**


A27 Investigating the functional role of the oestrogen receptor in LY2 endocrine resistant breast cancer cells

**Background:** The issue of acquired resistance to breast cancer regimes such as tamoxifen continues to negatively affect clinical outcomes. While many mechanisms of resistance have been discovered [1,2], there is evidence now of acquired resistance through adaptation of the oestrogen receptor itself leading to tumour progression [3]. A thorough understanding of the processes involved in the receptor's adaptation remains unclear. This study gives evidence of the gene signalling which shed light on the mechanism of adaptation in an LY2 endocrine resistant cell line oestrogen receptor knockdown model.

**Methods:** Real time PCR examines the gene expression profile of the LY2 cells under various treatments including oestrogen, tamoxifen and a mixture of both.

**Results:** It was found that the normal oestrogen receptor target genes PS2 and GREB1 display reduced expression without the presence of the receptor. However EGR3 signals excessively despite having the receptor stably knockeddown.

**Conclusions:** As a result these data provides evidence that EGR3 is involved in the adaptation of the oestrogen receptor and that global signalling of common target genes does not occur when the receptor adapt. Hence it demonstrates an initial clue of the process of adaptation in resistant tumours that have changed their receptor status.

**References**

Results: In 2012, as a result of screening plates with ceftriaxone from 139 stool samples 48 strains were cultivated. Those are 35 (72.9%) Escherichia coli strains and 1 (2%) strain of Klebsiella pneumonia. After determining the sensitivity of these strains to antibiotics by disk diffusion method, ESBL-producing confirmed in 24 samples: 23 (47.9%) ESBL-positive E. coli strain and 1 (2%) strain of K. pneumonia. According to the results of study in 2013, 280 microorganisms were cultivated from 292 stool samples, including 88.2% of E. coli (95% CI 20.24-34.14). Other types of microorganisms were encountered in rare cases. 86% E. coli (240 strains) were ESBL-producers. Significant differences in the two methods: the method of double-discs and agar plates containing ceftriaxone was not obtained (p<0.05).

Conclusions: The survey for 2012 was obtained 49.9% ESBL-producing strains, for 2013 - 86%, which means an increase in the prevalence of ESBL-producing strains. Using the agar plates containing ceftriaxone for ESBL screening significantly reduces the time and increases the level of studies of antibiotic-resistant strains of isolation.

References

A29
Is faster better? Operative duration in emergent appendicectomy
RT D’cruz1, E McDermott
1School of Medicine and Medical Sciences, University College Dublin, Dublin, Republic of Ireland; 2St. Vincent’s University Hospital, Dublin, Republic of Ireland
BMC Proceedings 2015, 9(Suppl 7):A29

Background: For many years, acute appendicitis has been regarded as a condition that required urgent surgical treatment. Emergent appendicectomy has been accepted generally as the most appropriate treatment, despite the lack of objective proof. The timing of appendicectomy has been investigated in the adult population but no definite conclusion has been made.

Purpose: The objective of this study was to investigate the effect of operative duration of appendicectomy on outcomes such as complications and length of stay.

Methods: A retrospective study of 271 patients who had undergone appendicectomy from 1 January 2013 to 31 December 2013 was conducted. Data that includes time of presentation to Emergency Department, presenting complaint, diagnostic investigations, time of operation, length of hospital stay and complications were collected. These patients were subsequently put into categories based on the duration of appendicectomy i.e. <45 mins, 46 - 60 mins, 61 - 75 mins, 76 - 90 mins & >90 mins.

Results: 182 patients had at least one form of diagnostic imaging modality performed. Pre-operative laboratory investigations were conducted in most patients, that included full blood count(FBC), Urea & Electrolytes (U&E) and inflammatory marker CRP. 193 out of 261 patients (73.9%) had their surgery within 24 hours of presentation. 253 patients (93.1%) had undergone laparoscopic appendicectomy. The average operating time was 63.8 mins. There was an exponential correlation between the operative duration and the length of hospital stay. There was no significant difference in the incidence of complications of acute appendicitis.

Conclusions: The timing of appendicectomy was associated with increased length of stay. The optimal timing of completion of appendicectomy for acute appendicitis would be within 60 mins from the time of skin incision. However, operative duration did not affect the incidence of complications of acute appendicitis.

References