

Res Medica CCLXIX (I)

Searching New Horizons: Medical Student Research



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Editor's Welcome

As editor I would like to welcome you to Res Medica, the Royal Medical Society's annual journal. For this edition of the 274th session the topic of discussion is 'medical student research'. History tells us how important this is and in many instances is comparable to research carried out by prominent scientists and doctors. A good example of this occurred in 1916 when second year medical student, Jay McLean, discovered heparin while working at the Department of Physiology of the Johns Hopkins Medical School in Baltimore. Only 20 years after its discovery in 1916 was the use of heparin as an anticoagulant actually recognized and subsequently used by clinicians. Unfortunately Jay McLean died of ischaemic heart disease at the age of 67 without recognition of his discovery. An attempt to nominate him for a Nobel Prize after his death was unsuccessful.

This example demonstrates that medical students can make or contribute towards extremely important discoveries but also highlights the need to recognise students for their endeavors in research. That is why in this edition I aim to give current medical students the opportunity to show how important their work is by encouraging them to publish their research.

I hope that reading this will inspire you to become involved in student research and encourage others to do the same.

Yours sincerely

Rebecca Martin (Editor)



RMS Council 274th session

News from the Society

Lectures for 274th Session

As per tradition, and true to the founding principles of the RMS, the 274th Session has provided both professionals and students to participate in the sharing of medical knowledge.

In previous sessions attendance at the weekly RMS meetings had diminished somewhat and, after conducting a survey of over 300 students using a short questionnaire, it was discovered that this was due to students feeling that previous presentations had been too research heavy and pitched at too technical a level.

To attempt to revive attendance at the weekly meetings, the student membership was polled to gain an insight into the presentations that would most interest them. It was through doing this that our presentation series "A Day in the Life of..." was decided upon.

Through this presentation series we have had doctors and surgeons from many different specialty areas who spoke to members about what their work has entailed, while still providing an opportunity for them to present interesting research at a more appropriate level. Commencing with Prof. Richard Knight's Inaugural Address "A Day in the Life of a Neurologist", it has been heartening to see weekly attendance maintained at high levels throughout the session! A big thanks must be paid to all those professionals who have helped to make this session both interesting and informative.

As my own interests lie in the field of emergency medicine, I wanted to produce a short presentation series about this specialty. I'd like to thank Prof. Colin Roberston for his presentation "Emergency Medicine: Sex, Drugs and A&E", Dr. Richard Lyon for "Prehospital Emergency Medicine", Dr. Ben Reynolds for "Paediatric Emergencies", and Mr. Joel Symonds for "Paramedicine". These presentations were extremely entertaining, informative, and very hands-on!

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Plans for presentations in the 275th Session are currently being produced, and I hope to make the next session as successful as the 274th. Thank you again to all those involved!

Connor Bowbeer

RMS Business Convener (2009-2011)

(If you are interested in presenting at one of our weekly meetings, please contact the RMS office: enquiries@royalmedical.co.uk)

Annual Dinner



Council and Guest of Honour Professor Eve C Johnstone

This year's RMS Annual Dinner for the 274th session was held in the Playfair Library, Old College for the second year running. A fantastic venue for what turned out to be a memorable night. As people began to arrive they were guided to enjoy a drink and some fine conversation. Following this, guests were shown up the stairs into the majestic library and

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setting for the spectacular dinner. Speeches were given by this years Presidents and guests Professor Eve C Johnstone, Mr Mike Porter and Mr Paul Jenkins gave their replies. The evening ended with a Ceilidh, giving guests a chance to relax and work off their dinner. This made for a fantastic evening enjoyed by all.



From left to right: Will Cowie, Katharine Bingham, Professor Eve C Johnstone, Kristina Lee and Paul Gray

Burns Supper

The Royal Medical Society's annual burns supper was held on the 25th January. It was a night of good food, good company and a fitting tribute to Robert Burns life and work. The celebrations were kicked off with a welcome from our president, Miss Kristina Lee, and grace was read. In keeping with tradition the haggis, carried by Mr Will Cowie, was piped in and placed on the top table. Mr Sandy Reid then gave an enthusiastic rendition of The Address To The Haggis. A delicious meal of haggis, neeps and tatties was then served, completed by shortbread and whisky. The Immortal Memory followed by Mr Owen Dudley Edwards. This was both interesting and historical, celebrating not only the life of Robert Burns but the life of our university as well. One of the highlights of the evening was the passionate telling of one of Burns most famous poems, Tam O'Shanter. The Reverend Iain Alexander was animated and exciting in his telling of the poem, even to the point of moving around the room and using props to bring the story to life. For anyone who had not heard many of Burns works before, this was an unforgettable experience. The speeches concluded with toasts to the

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lassies and laddies, presented by Mr Andrew Brookes and Miss Katharine Bingham respectively. These were both very entertaining and witty, whilst still appropriate for the occasion. Throughout the night, guests were encouraged to write their own poems in the spirit of Robert Burns. The best were then selected and read out by our president Miss Kristina Lee and the standard was high. Overall, an enjoyable night was had by all and the following ceilidh kept us all dancing well into the night, in perhaps the most fitting tribute of all to Burns' spirit.

Leiden Visit

Since the founding of the RMS, there has been a long standing connection with the University of Leiden and, to help strengthen and further this, there is an annual exchange between the two medical schools.

This year, from 18th to 21st March, we played host to 10 medical students from the University of Leiden including four students who hosted us last year during our visit to Holland. We were excited for the visit and so were our Dutch counterparts – one girl, Dominique, even paid over 500 euros for a new ticket after realising at the airport that she missed her original flights by a month!!

After a minor delay at the airport due to a bomb scare – we delved straight in to showing the students the sites of Edinburgh, starting with a tour of the Royal College of Surgeons of Edinburgh tour by the fantastic Mr Iain MacLaren. The tour was excellent and it was great to see displays demonstrating the historic connections between our two universities. Having shown the students some of the history of Edinburgh we were keen to show what students are currently involved in and later that evening we all went to watch the Medics Revue, a show thoroughly enjoyed by all!

For the rest of the weekend we ensured that the students experienced what Edinburgh has to offer including a visit to our version of the Heineken museum – The Scottish Whisky Experience, Edinburgh Castle, the Royal Mile, Arthur's Seat and trying traditional Scottish

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cuisine with a meal cooked by Council including haggis, neeps and tatties.

The dinner party held by the MacLarens on the Sunday evening was a wonderful way to spend the last evening of the Leiden students' visit and was definitely the highlight of the trip. We would like to thank the MacLarens for their generous hospitality, excellent cooking and brilliant entertainment, in addition to all those who made this exchange visit possible.

The weekend was a great success and the Dutch students found it difficult to leave, one even left the next day (although this was due to booking the wrong flight, which seems to be a running theme!!).

I think it is fair to say that both parties had a fun weekend and we have made some great friends and can't wait to go back over to Leiden!



RMS Council and guests after dinner

RMS National Conference 2011

On Saturday 12th March the RMS was pleased to welcome over 60 students from all across the UK to the Society's first National Conference for Undergraduate research. This was a big undertaking for the RMS Council but the day proved to be a huge success with an exceptional

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standard of research on display. We were extremely pleased to welcome two superb guest speakers, Professor Sir Neil Douglas and Professor Eve Johnstone. We would like to congratulate Marianna Theodoulou from the University of Edinburgh who was presented with the prize for best oral presentation and to Steven Smith from the University of Glasgow who was awarded the prize for the best poster presentation. Special thanks to Mr John Rainey and Dr Edward Duvall who acted as adjudicators on the day and to all those who were able to help on the day to act as Adjudicators for the poster presentations. Finally thanks to our sponsors who helped make the day such a success. We hope to make the Conference an annual event.

Commentary: Medical student research: a defining theme of the medicine programme at the University of Edinburgh

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An ability to “apply scientific method and approaches to medical research” is specified by the General Medical Council (GMC) in Tomorrow's Doctors (2009) as an essential set of skills that junior doctors should develop during their undergraduate programme, to take forward into their postgraduate Foundation training. In a wider context, this GMC document is influential, not only for steering the development of medical curricula in the UK, but also worldwide. Tomorrow's Doctors (2009) provides further detail and clarification, indicating that students should be able to critically appraise, formulate simple relevant research questions, apply findings from the literature to answer questions raised by specific clinical problems, and understand the ethical and governance issues involved in medical research.

The College of Medicine at the University of Edinburgh is a research-rich environment, in

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which our medical students are encouraged to integrate and participate. Students have a range of opportunities to develop their research skills and become involved in research, both formally within the curriculum, as well as informally. In the formal curriculum, the main opportunities for students are twofold. Firstly, all students incrementally develop their research skills in topics and specialties of their own choosing in their Student Selected Components (SSCs). These SSCs amount to approximately 20% of the whole medicine programme. They culminate with a major project as part of the 4th year timetable, which each student performs individually over 14 weeks with a senior member of staff. Secondly, a third of students take an intercalated Honours degree between their second and third years of medicine, which also provides a substantial research project component. The most popular intercalated Honours courses include Reproductive Biology, Sports Science, Neuroscience, Physiology, International Public Health Policy, Pharmacology, Medical Biology, Infectious Diseases, and Psychology. Informally, many students create some spare time to become involved in ongoing research projects with research-active staff outside their set timetables.

The term 'research' is used in the broadest sense in this context of medical student research, to also incorporate studies classed as audit and service evaluation (National Research Ethics Service, 2007). All can use a similar range of quantitative and qualitative methodologies, and the research skills gained are broadly the same. It is more how the research question is formulated, the study designed to test the question, and the governance and ethics appraisal, that can all differ slightly (NRES, 2007). The research projects which Edinburgh medical students are involved in are across the whole spectrum of fields, specialties and topics, using the full range of methodologies. The major categories of projects in the 4th year SSC are, in order of prevalence, audit and service evaluation, clinical research projects in a wide range of different formats, and literature review studies including systematic reviews.

The delivery of these research competencies in the SSCs at Edinburgh dovetails with the evidence-based medicine core teaching. The Edinburgh curriculum provides students with more opportunities at the "applied research" end of the spectrum compared to most medicine programmes at other UK schools. There may be a less strong research environment at many

of these other medical schools, so these required research learning outcomes may be delivered in core teaching and as shorter SSC educational projects. The SSCs at many other schools may have a slightly different focus towards providing students with choice to undertake a more in-depth clinical experience (Riley 2009). In addition, at most other schools fewer students take an intercalated degree. It is also important to recognise that there are a wide range of other competencies that a student will develop which are interwoven with performing a research project, including professional self-management, teamworking, informatics and communication skills (Murdoch-Eaton *et al* 2004).

Students themselves are becoming increasingly focussed and motivated to be actively involved in research studies. This is likely due to a range of reasons, not least the environment and the medicine programme structure in which they are immersed, the interest it can stimulate in a student, in conjunction with the learning outcomes they have to attain. Involvement in research is also driven, perhaps inappropriately in some ways, by the Foundation job application process, which awards extra contributory points for demonstrable research output by a student. Reflecting this, over the last decade hundreds of students have been authors on published abstracts and journal articles. With these complex considerations, students need clear guidance on how to make the best of their limited opportunities for choice within the formal and hidden curriculum (Riley *et al* 2009).

For student research projects in the formal curriculum to be successful both on an individual basis and also sustainable long-term, there has to be good alignment, and not only between the aims and requirements of students and the curriculum, as already discussed. The motivation and support of staff must also be taken into consideration, who have to be repeatedly willing to act as supervisors. These project supervisors see both short and long term benefits of students participating in research under their guidance. These extend from having an enthusiastic student involved and assisting in advancing a project of mutual interest, to the altruism of encouraging good motivated students to consider the supervisor's own specialty as a career (MacDougall and Riley, 2010; Riley 2009). Supervisors commonly become mentors and sources of references for job applications. They may eventually even

become seniors to their research students, who have followed a career path that began to evolve several years earlier from participating in a specific research project.

There are obvious wider benefits to student involvement in performing research studies, beyond student learning and career exploration. These include increasing the knowledge base by publication of findings, and generating pilot data that can form the basis of grant applications. All are to the University's benefit and can contribute to the Research Assessment Exercise. There are also clear gains for the NHS Trusts, which can use audit and service evaluation data to improve patient care, service delivery and patient safety. The large number of systematic reviews submitted to the World Health Organisation International Child Health Review Collaboration (ICHRC, 2011), to describe and make accessible the evidence base for paediatric care in resource poor settings, is to highlight one significant contribution made by University of Edinburgh medical students and their supervisors.

Developing skills and participating in research amounts to a defining theme of the Edinburgh medicine programme. The aim through the design of the curriculum is that Edinburgh MBChB graduates, through their research experiences, develop a real understanding and an ability to respond to the challenges and uncertainties that medicine will present in the 21st century. It may also encourage some of them to become the medical researchers of the future. Research performed by medical students at Edinburgh is more robust than ever – long may this continue.

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Medical Student Research: My Personal Experience

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The memory of my very first research experience as a medical student is a fond one. It was a Blue Peter effort. There we were, ten teenage girls in their first year first term of medical school, sitting in a seminar room at a gynaecology clinic and given the title 'Fears about Smears' to prepare a poster for an undergraduate competition. After designing our own questionnaire and nervously speaking to real patients, our award-winning 3D poster had a larger-than-life DIY model of the female genitalia in a polystyrene box all complete with a hanging plastic speculum. Okay, it was not any highbrow Nobel prize-worthy research, but it certainly was the first baby step towards it for those with ambitious goals and dreams. I hear you say 'REALLY? Did you really learn anything from that? It all sounds like child's play.' The answer is a resounding yes. Learning about the cervical screening programme aside, I started to appreciate the value of questionnaire-based research, and probably more importantly life skills such as team-work and communication (remember we were a group of 17-18 year old girls!).

Do you recall your personal statement and your interview getting into medical school? Did you say something along the lines of 'I want to help people... or a friend/relative of mine suffered from...'? A cliché it might have been, but this cliché was and still is the very reason why I have started and continued my line of research. It was in the autumn of my second year of medical school when my grandfather was terminally ill with liver cancer. The sting of mortality to someone so close was very raw. One of the last things that he had said to me was to consider pursuing liver-related research. And so I am to this day. Why am I telling you something so personal? It is because now as I am finishing my PhD studies and reflecting on

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all those times when things did not work out the way you wanted them to, having a clear purpose and vision will help achieve your goals and keep you motivated and enthused.

My first liver-related project was during the year of intercalated BSc when I spent the last semester in a laboratory investigating the prevalence of hepatitis B in a south-east Asian country. The project involved testing 500 previously collected serum samples for hepatitis B surface antigen using an enzyme-linked immunosorbent assay kit. You can imagine the amount of pipetting! At the time, many of my colleagues, myself included, were under the illusion that if you work in the lab for eight weeks, then you are almost guaranteed a publication at the end of it. Sorry to burst your bubble but let me tell you the truth so that you have realistic expectations when your time comes: most people do not have a first-author or co-author publication as a result of their BSc projects even though your supervisor might advise otherwise. Realistically, high-quality high-impact basic scientific research takes years if not decades to develop and come to fruition. Eight weeks is not long in the grand scheme of things and often not long enough to generate a positive result. Even if your lucky star is shining upon you and you do get a positive result, you might not necessarily feature as an author on a publication. The International Committee of Medical Journal Editors has specified three necessary conditions for authorship and all three must be met. Authorship credit should be based on substantial contributions to (a) conception or design, or analysis and interpretation of data; to (b) drafting the article or revising it critically for important intellectual content; and on (c) final approval of the version to be published (1, 2). As such, mere assistance in the laboratory does not warrant an authorship and contributions of research participants are commonly noted in the acknowledgements section. Do not let me put you off though. I would recommend anyone doing an intercalated BSc, and if I were to go back I would definitely do it again. Treat it as a learning experience. You will broaden your knowledge base on a subject of your choice, learn basic laboratory techniques, gain insight into what goes on behind the scene when you send away a test as a clinical workup, and acquire transferable skills of critical appraisal, statistical analysis, applied writing, and presentation skills.

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Knowing what I learnt from my intercalated BSc and wanting to gain experience in clinical research, I made a conscious decision in carrying out a clinical project for my 4th year SSC. I went onto PubMed, typed in 'hepatocellular carcinoma', reviewed recent publications, identified a gap in current knowledge, and formulated a research question to present to my supervisor. That sounds easy but the devil is in the detail! I proposed to investigate the different scoring systems available to predict survival in patients with hepatocellular carcinoma and determine their applicability in our cohort of Scottish patients. The project involved designing a proforma for data collection, reviewing case notes and CT scans from 102 patients, creating a relational database, and analysing data with appropriate statistical tests. It was not a trivial undertaking. Self-discipline, motivation and momentum are paramount to succeed in your project, but finding a good supervisor was as important as doing the actual research. With my interests in liver cancer and determination to pursue a surgical career, I approached a hepatobiliary surgeon who became my project supervisor and in subsequent years has become my mentor. My supervisor acted as a broker, by exerting upward influence and acquiring needed resources; a director, by providing direction and expertise and clarifying priorities; and a facilitator, by facilitating consensus and monitoring progress. We shared mutually acceptable goals and plans, and the project had a fruitful outcome as the study was presented at a national meeting and published in a peer-reviewed journal.

All in all, not only has undergraduate research allowed me to gain insight into the different types of research and their implications for clinical advancement, it has also equipped me with fundamental skills that are transferable to both my clinical and scientific practice. After completion of my Foundation Programme, I was successful in competing for the highly prestigious Medical Research Council/Royal College of Surgeons of Edinburgh Clinical Research Training Fellowship which has funded my PhD studies. Obtaining this fellowship has also acted as a springboard to secure a Clinical Lectureship in General Surgery at the University of Edinburgh, enabling me to continue with liver research throughout my surgical training.

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Here are my top five tips to successful medical student research and beyond:

1. Plan, plan and plan ahead
2. Develop patience, resilience and confidence
3. Find an appropriate supervisor(s)
4. Network and build bridges
5. Stay focussed

So whilst any kind of research project is likely to be harder work than you anticipate the rewards in terms of personal development, transferable skills and acquisition of knowledge make this a worthwhile endeavour.

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Implementation of a sensitive troponin I assay reduces death and recurrent myocardial infarction in patients with suspected acute coronary syndrome

Kuan Ken Lee, University of Edinburgh

Introduction: Although troponin assays have become increasingly more sensitive, it is unclear whether further reductions in the threshold of detection for plasma troponin concentrations will improve clinical outcomes in patients with suspected acute coronary syndrome.

Materials/Patients and Methods: Consecutive patients admitted with suspected acute coronary syndrome before (n=1,038; validation phase) and after (n=1,054; implementation phase) lowering the diagnostic threshold for myocardial necrosis with a sensitive troponin I assay were stratified into three groups: <0.05, 0.05-0.19 and >0.20 ng/mL. During the validation phase, only concentrations above the previous diagnostic threshold of >0.20 ng/mL were reported to clinicians.

Results: Plasma troponin concentrations were <0.05 ng/mL in 1,340 (64%), 0.05-0.19 ng/mL in 170 (8%) and >0.20 ng/mL in 582 (28%) patients. During the validation phase, 39% of patients with undisclosed troponin concentrations of 0.05-0.19 ng/mL were dead or had recurrent myocardial infarction at one year, compared to 7% and 24% of those with troponin concentrations <0.05 ng/mL (P<0.001) or >0.20 ng/mL (P=0.007) respectively. During the implementation phase, lowering the diagnostic threshold to 0.05 ng/mL reduced one-year death and recurrent myocardial infarction from 39 to 21% in patients with troponin concentrations of 0.05-0.19 ng/mL (OR 0.42, 95%CI 0.24-0.84, P=0.013).

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Discussion: In patients with suspected acute coronary syndrome, implementation of a sensitive troponin assay increases the diagnosis of myocardial infarction by a third, and identifies those at high-risk of reinfarction and death. Lowering the diagnostic threshold of plasma troponin in patients with suspected acute coronary syndrome is associated with major reductions in morbidity and mortality.

Impact of the introduction in Tayside of the Colorectal Pathway on time to diagnosis and staging in Colorectal cancer.

Michael Warnock, University of Dundee

Introduction: In August 2007, a new referral pathway for colorectal complaints was introduced in Tayside allowing referrals from primary care to be vetted daily by a GI physician. The aim was to decrease waiting times, create equality of access and improve outcome. This audit assesses whether these aims are being met by looking at referral to diagnosis times, referral to treatment times and Dukes stage from all the patients diagnosed with colorectal cancer (CRC) before its introduction in 2005 and after in 2009.

Method: Patients diagnosed with CRC in Tayside were identified in both years. Date/source and mode of referral, date of diagnosis, date of treatment, type of treatment and staging were recorded.

Results: A total of 124 patients in 2005 and 204 patients in 2009 were diagnosed with CRC. In 2005, 39 patients were referred to outpatient clinics from primary care with a median referral to diagnosis time of 57 days and referral to treatment of 130 days. In 2009 patients with similar complaints were referred via the new referral pathway. A total of 86 patients were referred with a median referral to diagnosis of time of 23 days and referral to treatment time of 65.5 days. The majority of patients in the 2005 group had stage Dukes C1 at diagnosis (41.06%) compared with patients in 2009 where the majority was Dukes B (46.51%).

Conclusion/Discussion: The new pathway has streamlined the referral process; it expedites the diagnosis of CRC in symptomatic patients and may increase the likelihood of diagnosing CRC cancer at an earlier stage.

Host and Viral Targets for Antibody-Based Therapies in Head & Neck Squamous Cell Carcinoma

Samuel Pattle, University of Edinburgh

Introduction: An increasing subset of Head and Neck Squamous Cell Carcinomas (HNSCC) test positive for Human Papilloma Virus, while another subset of tumours contain a chromosomal amplification at Chr11q13. We have exploited these molecular subsets as the basis for identifying viral and host therapeutic candidates, and are using phage display technology to generate monoclonal antibodies against our selected targets.

Methods: Host and viral biomarker targets were identified within the HPV16 genome and 11q13.3 amplicon regions using bioinformatics decision tree analysis. Affinity selection of phage antibodies was performed using an established phage display library (ROTMAR), biotinylated peptides derived from E5, and streptavidin-coated beads.

Results: Analysis of the HPV16 genome identified the E5 protein as a target for antibody-based therapy; E5 is a transmembrane protein with extracellular regions, and demonstrated cell surface expression.

Four peptides derived from E5 protein were used to pull out phage antibodies from 4 successive selection rounds of the phage library, generating a portfolio of phage antibodies against the E5 peptides. Specificity of phage antibodies was confirmed using ELISA. Bioinformatic analysis of the 11q13.3 amplicon identified a series of potential host targets for antibody-based therapy; ANO1, Folate Receptor 3, LRP5, FGF3, 4 & 19.

Conclusions: We have identified a series of viral and host targets with potential as antibody-based therapies, and generated E5-specific antibodies from a phage display library, as the first steps towards development of novel monoclonal antibody therapies for HNSCC. Future work will confirm target expression in tissue biopsies, and continue development of monoclonal antibodies.

Phenotype of paediatric-onset Crohn's Disease in Scotland: **Comparisons of classification system**

Alexandra Bain, University of Edinburgh

Introduction: The current model for paediatric IBD classification is the Paris system (2010) based on macroscopic (endoscopic) findings only. The Edinburgh group has postulated that the use of macroscopic details alone may be insufficient and put forth the suggestion to use macroscopic and/or microscopic (histopathological) findings. We aimed to compare the present classification systems and the model suggested by the Edinburgh group.

Materials/Patients and Methods: Patients on the prospective IBD genetic database from the Royal Hospital for Sick Children, Edinburgh were used, augmented by information from the University of Edinburgh paediatric IBD database. Analysis of the choice of determinant of location (macroscopic alone, microscopic alone, macroscopic and microscopic, macroscopic and/or microscopic) of paediatric CD was performed using the kappa statistic and Pearson's chi-squared.

Results: The data included 58 patients (M:F 34:24, median age at diagnosis 11.5 years). Comparing the Paris and Edinburgh system there was significant agreement ($p < 0.05$) for upper GI disease and pure colonic disease but no significant agreement on ileal involvement or the number of patients with CD. The Paris model failed to diagnose 2/58 (3.4%) patients with CD which on the Edinburgh criteria had definite disease. Interestingly there was significant agreement in pure ileal disease (L1) when comparing the Paris classification and the microscopic alone classifications.

Discussion: The suggested Edinburgh classification detects more CD on presentation than the currently used Paris system. The main area of disagreement is ileal disease.

Evaluation of Epithelial-to-Mesenchymal Transition in Renal Cell Carcinoma

Marianna Theodoulou, University of Edinburgh (Oral Presentation Winner)

Introduction: Epithelial-to-mesenchymal transition (EMT) has recently been implicated as a key process in tumour invasion and metastasis. EMT is associated with a reduction in e-cadherin, a key cell-cell adhesion molecule. This study aims to evaluate the presence of EMT in renal cell carcinoma (RCC) by using automated quantitative analysis (AQUA) to measure the expression of proteins believed to be associated with EMT.

Patients and Methods: Seventy-nine patients with renal cancer were assessed for the expression of WT1, snail, slug, e-cadherin and phospho-beta-catenin using quantitative immunofluorescence. Kaplan-Meier analysis was employed with log-rank testing to generate survival curves with respect to RCC progression free survival (PFS) for the individual targets, pathological variables and according to the EMT profile.

Results: A significant association with PFS was only achieved for e-cadherin, localised to the cytoplasm ($p=0.006$). Out of the 79 patients, only 13 tumour samples expressed the EMT signature. No variation in the PFS status was observed between patients exhibiting the EMT phenotype and those that did not.

Conclusions: Although we were unable to adequately demonstrate the presence of EMT in RCC, mainly due to our sample size, we believe it is of great importance to test the original hypothesis using a larger number of patients.

A Systematic Review of Taste in Eating Disorders

Abigail Martyn, King's College London

Introduction: While it is understood that individuals with an eating disorder have significantly abnormal and disordered eating behaviours, the aetiology of this is not yet fully understood. Recent research is re-examining the role of 'eating' in eating disorders. Taste has been examined to further understand its physiological and affective role in the disorder. Alterations in taste in eating disorders have not been systematically reviewed until now.

Method: A systematic literature search in Embase, Medline, PsychInfo and Web of Science was conducted in May 2010 with further hand searching of reference lists of retrieved publications. The search for literature relating to gustatory function in eating disorders identified 626 papers which were then screened for inclusion criteria and 21 were selected.

Results: All the papers exhibited differences between the eating disordered group and the healthy controls, including two studies of recovered subjects. Four papers found differing patterns of activation on neuroimaging whilst one revealed reduced fungiform papillae. The remaining papers, using self report measures, demonstrated marked differences in taste preferences with a dislike for fat containing foods and a significant preference for sweetness. The majority found no impairments in sensory perceptions or taste intensity.

Conclusions: The results suggest that people with eating disorders have some form of impairment in taste, which remains following weight regain. These findings may contribute to improving clinical treatment of eating disorders, particularly in the area of refeeding and can provide further insight into interoceptive function.

Magnetic Resonance Imaging in the Detection of Spinal Cord Compression

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Introduction: Metastatic Spinal cord compression (MSCC) is associated with high mortality and morbidity in cancer patients meaning rapid diagnosis and treatment of the condition is essential. In Scotland, thus new guidelines for referral and diagnosis were introduced, including recommendations for MRI imaging to be performed within 48 hours. To comply with this guideline Gartnavel General Hospital introduced a Saturday MRI scanning service for imaging high risk patients over the weekend.

Aim: To review the MRI scanning service for suspected spinal cord compression at Gartnavel General Hospital and the Western Infirmary, Glasgow.

Methods: Retrospective audit of 143 patients undergoing a full spinal MRI scan for suspected MSCC in Gartnavel General Hospital or the Western Infirmary, Glasgow between March 2010 and August 2010. Using data extracted from the CRIS system, scan text was reviewed pathological findings including evidence of cord compression.

Results: 32 out of the 143 patients scanned (22%) had established MSCC, 64 had vertebral metastases but no overt cord compression. In 27 of the remaining 47 patients with no evidence of vertebral metastases or MSCC an alternative diagnosis for their symptoms was suggested. Thus 123 of the 143 cases (86%) had findings explaining their presentation.

The Saturday scanning service was responsible for diagnosing 12.5% of all cord compression cases (4 cases), this compared favourably to pre-guideline, weekend diagnosis, of 8% of all cases.