



UNDERGRADUATE RESEARCH DAY

FRIDAY OCTOBER 21ST 2011

NUI GALWAY



Undergraduate Research in the School of Medicine

Embedded within the School of Medicine's Strategic Plan (2010-2014) is the overarching objective of supporting and developing undergraduate research activity within the Curriculum. By supporting and developing undergraduate research activity the School of Medicine is developing high calibre doctors with enormous research potential. Furthermore, it may encourage the development of the next generation of physician-scientists.

The Working Group for Undergraduate Research was established late 2010 and helped streamline and formalize a summer research program for undergraduate medical students. There was strong interest from the medical student body with over 60 candidates who partook in a summer research project. In addition, 40 medical and scientific faculty from both within the School of Medicine and Science, NUIG and the affiliated hospitals (i.e. Sligo General and Letterkenny) provided supervision for these projects. Students applied for external funding from grant agencies such as the HRB and Wellcome Trust. In 2011, 18 students within the programme secured funding from sources external to NUIG. In addition, internal funding in the form of Curriculum Innovation Fund and Research Support Fund stipends (13 in total) were offered to students.

A formal induction session on research methodology and research support systems was delivered by NUIG faculty prior to the commencement of summer projects. Tutorials and support on statistical methods was provided by Dr. Gloria Avalos over the summer. All students having now completed their work and will present their research today either in oral or poster format at our Annual NUIG Medical Undergraduate Research Day, with many anticipating presentations at both national and international meetings. Some students have even managed to draft a research article which is a phenomenal achievement given the time constraints. The

general feedback from the summer scheme has been very positive and it is inspiring to see so many hardworking, inquisitive and dedicated research-orientated medical students.

This year, the Undergraduate Research Day will be opened by Dr. Armand Keating, Prof. of Medicine, University of Toronto and will incorporate a Grand Rounds lunchtime lecture by Prof. Jozef Bartunek, Consultant Cardiologist, OLV Hospital, Belgium and will be closed with The John D Kennedy Lecture to be given by Dr. Ramona McLoughlin, Consultant Gastroenterologist, UCHG. We are anticipating a large turn-out from both medical students and faculty alike.

I would like to take this opportunity to thank all NUIG faculty who contributed to the summer induction programme and to Prof. McCarthy for organizing a very successful event, Gloria Avalos for providing invaluable statistical support to the programme, The Undergraduate Research Committee for all their hard work throughout the year with special mention for Ms. Una O'Connor, Discipline of Pathology Staff Ms. Lorraine Murphy, Ms. Laura Moran and Mr. Mark Webber who helped with the organization of the meeting today and finally to all the students and supervisors who have made it such a successful year for Undergraduate Research within the School. I hope you enjoy the day.

Dr. Richard Flavin

On behalf of the undergraduate Research Committee

Overall Chairman

Prof. Peter McCarthy

Chairmen:

Session 1- Dr. Fabio Quondamatteo

Session 2- Dr. Thomas Ritter

Session 3- Dr. Richard Flavin

Adjudicators:

**Oral Session- Prof. Ivan Perry, Dr. Karl Sweeney,
Dr. Liam Bannan**

**Poster Session- Dr. Teckwee Boo, Prof. Martin O'Donnell, Dr.
Sanjeev Gupta**

**Abstract Selection Committee
Undergraduate Research Committee**

SCHEDULE

8-9am

Introductory Remarks

Galway Health Research Board Clinical Research Facility Lecture: 'Mesenchymal Stromal Cells: Translational and Clinical Aspects'

Dr. Armand Keating MD, FRCP(C)

Professor of Medicine,

Epstein Chair in Cell Therapy and Transplantation Director, Division of Hematology,

Professor, Institute of Biomaterials and Biomedical Engineering, University of Toronto

Director, Cell Therapy Program Princess Margaret Hospital, Toronto.

Hosted by Prof. Frank Giles

Venue: LLT

9.00-10.15

Session 1

(8 oral presentations) 8x9 minutes incl. Q&A

Chair: **Dr. Fabio Quondamatteo**

Venue: LLT

10.15-10.30am

Break

10.30-12.00

Session 2

(10 oral presentations) 10x9 minutes incl. Q&A

Chair: **Dr. Thomas Ritter**

Venue: LLT

12.00-13.00

UCHG/NUIG Hospital Wide Grand Rounds:

'Stem Cell Therapeutics in Heart Failure'

Prof Jozef Bartunek, PhD,

Consultant Cardiologist,

Aalst, OLV Hospital, Belgium.

Hosted by Prof. Tim O'Brien/Dr. Faisal Sharif

Venue: LLT

[13.00-13.30](#)

Lunch

[13.30-15.30](#)

Poster Viewing

Venue: Concourse CSI Third Floor

[15.30-15.45](#)

Break

[15.45-17.45](#)

Session 3

(12 oral presentations) 12x9 minutes incl. Q&A

Chair: **Dr. Richard Flavin**

Venue: LLT

[17.45-18.00](#)

ISCOMS experience

[18.00 -18.30](#)

John D Kennedy Lecture:

'If we knew what we were doing it wouldn't be called Research'

Dr. Ramona McLoughlin,
Consultant Gastroenterologist,
UCHG.

Venue: LLT

[18.30-18.45pm](#)

Presentation of Prizes

Closing Remarks

Venue: LLT

ORAL PRESENTATIONS

NAME	SESSION	TIME		
Aoife Murray	1	9:00AM		
Abi Manian	1	9.09AM		
Alan Jacobsen	1	9.18AM		SESSION ONE
Ann Spellman	1	9.27AM		09.00AM-10.15AM
Catherine Crowe	1	9:36AM		
Cliona Small	1	9.45AM		
Darrell Martin	1	9.54AM		
Dympna O'Dwyer	1	10.03AM		
Erinn McGrath	2	10.30AM		
Fergus Keane	2	10.39AM		
Fiachra O'Deasmhunaigh	2	10.48AM		
Jennifer Scott	2	10.57AM		
Joseph Walsh	2	11.06AM		SESSION TWO
Michelle Casey	2	11.15AM		10.30AM-12.00NOON
Katie Lydon	2	11.24AM		
Michael McNamara	2	11.33AM		
Mahrukh Azhar	2	11.42AM		
Maria Duignan	2	11.51AM		
Matthew Smyth	3	15.45PM		
Kezanne Tong	3	15.54PM		
Michelle Furey	3	16.03PM		
Patrick Cullinane	3	16.12PM		
Robert McGrath	3	16.21PM		
Ryan Sugrue	3	16.30PM		SESSION THREE
Stephen Chiu	3	16.39PM		15.45PM-17.45PM
Sarah Cormican	3	16.48PM		
Shane Brennan	3	16.57PM		
Sharon Cowley	3	17.06PM		
Ursula Donigiewicz	3	17.15PM		
Yasir Loai	3	17.24PM		

POSTER PRESENTATIONS

NAME	POSTER BOARD NUMBER
Alison Havelin	1
Andrew Carroll	2
Anna Gubbins	3
Brid Galvin	4
Cliona Flanagan	5
Claire Kearney	6
Darren Kilmartin	7
Eibhlin Higgins	8
Eimear O'Brien	9
Ella Murphy	10
Emma Samijono	11
Gregory O'Neill	12
Hannah Linane	13
Isabel Haugh	14
Jacqeline Driscoll	15
Joe Thomas	16
Kate Dinneen	17
Laura Reynolds	18
Michelle Arakgi	19
Maeve O'Connor	20
Mark Gurney	21
Martin O'Maolain	22
Natallia Kharytaniuk	23
Norlisa Khalid	24
Orlaidh Burke	25
Owen Gallagher	26
Su-Shan Chan	27
Syed Naqvi	28
Paul (Joon Koo) Choi	29

ORAL PRESENTATIONS: ABSTRACTS

The Effect of Dietary Gluten and Intestinal Permeability on Autoimmune Myocarditis

Aoife M. Murray,^{1,2} Eric V. Marietta,^{1,3} David Luckey,¹ Chella S. David,¹ and Veena Taneja¹

¹Department of Immunology, Mayo Clinic College of Medicine, Rochester, MN 55905, USA

²National University Ireland – Galway, 2 MB3

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Autoimmune myocarditis can lead to dilated cardiomyopathy resulting in death. Aetiology of the disease is poorly understood. Studies have shown that it can be associated with coeliac disease, an immune reaction against dietary gluten characterised by anti-tissue transglutaminase (tTG) and anti-gliadin antibodies.

Recent studies have attributed the development of coeliac disease to an increase in intestinal permeability (IP) that leads to availability of luminal antigens to systemic immune response. The aim of this study was to determine if autoimmune myocarditis is associated with dietary gluten and/or increased IP. We took advantage of humanised mice expressing HLA-DQ8.Abo.NOD that develop spontaneous autoimmune myocarditis and are gluten-sensitive. Mice were fed various diets; standard (contains gluten), gluten-enriched, and gluten-free diets, to determine if it affected the frequency and age of onset of myocarditis, anti-tTG antibodies and its correlation to IP in transgenic mice. Permeability was measured at various ages using orally-administered FITC-labelled dextran. Myocarditis was identified with heart-to-body ratios and heart histopathology. Production of sera antibodies against gliadin and tissue transglutaminase (tTG) was measured by ELISA. No association was found between dietary gluten and development of autoimmune myocarditis. However, mice with myocarditis showed increased IP and significantly higher anti-tTG IgG antibodies compared to healthy mice. In conclusion, our study showed that in the absence of association of dietary gluten and myocarditis, it is pertinent to explore the role of increased gut permeability and anti-

tTG antibodies in pathogenesis of disease as well as useful biomarkers.

Histological Evaluation Of An MSC Seeded Scaffold For Cartilage Repair In A Rabbit Model

Manian, A; Mohamed, K; O'Flaharta, C; Barry, F; Barron, V
Murphy, M

1MB3

Regenerative Medicine Institute (REMEDI), National University of Ireland, Galway

Diseased or damaged cartilage has a limited capacity for self-repair. Over the last 20 years there have been many tissue engineering strategies and cell therapies developed to address this problem. In this research, a histological methodology for embedding, sectioning and staining osteochondral plugs was optimized to assess cartilage repair. Rabbit mesenchymal stem cells (rMSCs) were harvested from the femur of a male white New Zealand rabbit, subcultured *in vitro*, and seeded on multi-layered polymeric scaffolds. In parallel, osteochondral plugs that were previously implanted in the medial condyle of male New Zealand rabbits were harvested, decalcified in Surgipath decalcifier II, embedded in paraffin, and sectioned at 5 μ m intervals. In total, 30 tissue samples were processed to compare cartilage repair in empty defects, defects containing scaffolds, and defects containing cell-seeded scaffolds.

To this end, immunohistological staining was optimized for Toluidine Blue to show the presence of newly formed glycosaminoglycans (GAGs). The 2x and 4x images, taken using the Brightfield microscope, revealed that the best cartilage repair was observed in the samples with the cell-seeded scaffolds, while there was little to no evidence of repair in the defects containing empty scaffolds or in empty defects. In summary, a histological evaluation method was developed and optimised to allow comparison of cartilage repair in osteochondral defects in a rabbit model.

High Throughput Screening to identify drugs that induce cell death in Chronic Lymphocytic Leukemia cells.

Alan Jacobsen, 2MB3

Alessandro Natoni, Corrado Santocanale.

National Centre of Biomedical Science and Engineering (NCBES)

Chronic Lymphocytic Leukemia (CLL) is the most common leukemia. Although there are many treatments available, there is no outright cure. The aim of my project was to screen for cytotoxic compounds active against. As CLL cells die after approximately 2 days *in vitro*, we used the HG3 CLL cell line, immortalised with the Epstein-Barr Virus for the experiments.

We characterised the HG3 cells immunophenotype and carried out dose-response analysis of the HG3 cells to some already know CLL cytotoxic compounds. We found that the HG3 cells displayed the immunophenotype characteristic of CLL and they responded in a similar manner to cytotoxic compounds as proliferating CLL cells.

We screened the Tocris Library of Kinase Inhibitors using the Cell Titer-Glo assay and found some new cytotoxic compounds such as inhibitors of chk1, while the screen also produced some already known hits which reinforced the quality of the assay.

Dose-response analysis of the hits may enable us to elucidate viable compounds and the assay may be used to screen further libraries.

Does hormone receptor status influence survival in HER2 positive breast cancers?

A. Spellman, A.M. McDermott, D. Wall, M. Keane, P. Donnellan, K.J. Sweeney, M.J. Kerin

Introduction

Almost one quarter of breast cancers demonstrate over-expression of the HER2/*neu* proto-oncogene. However, even within this group, tumours display marked molecular heterogeneity, explained by differing hormone receptor status confirmed by immunohistochemistry. Most tumours are either HER2/*neu*-overexpressing (ER-PR-HER2+) or Luminal B (ER+PR+HER2+), with a small proportion being ER+PR-

HER2 or ER-PR+HER2. We aimed to establish the proportion of each of these subtypes within HER2/*neu*-positive breast tumours, and to compare the disease free (DFS) and overall survival (OS) of the different subtypes.

Method

HER2/*neu*-positive patients were identified from our prospectively maintained Breast Cancer Database over a ten-year period, from 2000 to 2010. Patient charts were reviewed and correlated with clinicopathological details. The results were analysed using SPSS V18.0.

Results

There were 242 cases of HER2/*neu* over-expressing breast cancers identified. One hundred and five cases (43%) were of Luminal B subtype, seventy-seven (32%) were HER2 Subtype, while thirty (12.4%) were ER+PR-HER2+ and nineteen (7.9%) were ER-PR+HER2+. Those with ER+PR-HER2+ tumours had improved ten year DFS and OS compared to other groups, 85.9% and 96.7% respectively. The DFS for the HER2, Luminal B and ER-PR+HER2+ groups were 71.1%, 68.5% and 65.5%. The OS for the same groups were 73.9%, 86.4% and 96.7% respectively.

Conclusion

ER+PR-HER2+ breast tumours had improved ten-year DFS and OS compared to other HER2/*neu* positive subtypes. It is important to consider hormone receptor status in those diagnosed with HER2/*neu*-positive breast cancer.

The HER2/*neu* proto-oncogene is expressed by almost a quarter of breast tumours, and renders these tumours sensitive to treatment with Trastuzumab. However, it is also important to consider the hormone receptor status in this group of patients, particularly when considering prognosis.

Atlantic dip: The prevalence of pre-diabetes/type 2 diabetes in an Irish population with gestational diabetes mellitus 1-5 years post index pregnancy.

C Crowe¹, E Noctor¹, Carmody LA¹, Wickham B¹, Avalos G¹, Gaffney G², P O'Shea³, Dunne F¹; for the ATLANTIC DIP Collaborators

1. Department of Medicine, GUH and UIG
2. Department of Obstetrics and Gynaecology, GUH
3. Department of Clinical Biochemistry, GUH

Introduction

Our ATLANTIC-DIP (diabetes in pregnancy) programme showed 18% of women with gestational diabetes mellitus (GDM) screened with a 75g oral glucose tolerance test (OGTT) 12 weeks post-partum demonstrated glucose intolerance. However, long-term data on progression to type 2 diabetes (T2DM) post gestational diabetes (GDM) in an Irish population is lacking.

Method

We compared Caucasian women with previous GDM (n=116), and with normal glucose tolerance (NGT) during pregnancy (n=52), using a 75g OGTT, to determine prevalence of diabetes/pre-diabetes 1-5 years post index pregnancy. Women with abnormal OGTT 12 weeks post-partum (n=22: IFG/IGT, n=20, DM, n=2) did not undergo OGTT, but were included in the analysis. American Diabetes Association diagnostic criteria for IFG/IGT/DM were used.

Results

12% (11/94) of GDM patients rescreened had pre-diabetes/DM (IFG/IGT, n=10, DM, n=1), giving a prevalence of 28.4% (33/116) for pre-diabetes/diabetes, versus 2% (1/52) of women with NGT during pregnancy.

Logistic regression analysis was used to determine index pregnancy factors associated with post-partum pre-diabetes/diabetes. These were: first-degree relative with DM (OR 2.8 95% CI 1.0,7.4, p=0.04), insulin use during pregnancy (OR 3.4, 95% CI 1.2,9.6, p=0.01), fasting glucose during pregnancy (OR for glucose \geq 5.6mmol/L: 4.5 95% CI 1.4, 14.2, p= 0.01) and not breastfeeding (OR 3.2 95% CI 1.2, 9.1, p=0.02).

BMI in pregnancy was not associated with pre-diabetes/diabetes at 1-5 years.

Summary:

The high prevalence of diabetes/pre-diabetes in this population offers an opportunity to develop a screening program to benefit at risk individuals, particularly targeting those with insulin-requiring GDM, higher fasting glucose levels and positive family history.

The Duration of Mesenchymal Stem Cell (MSC) Immunosuppressive Phenotype Following Co-culture with Activated T-cells.

Authors Cliona Small, Michelle M. Duffy, Thomas Ritter & Matthew D. Griffin.

Regenerative Medicine Institute (REMEDI), National Centre for Biomedical Engineering Science (NCBES) and School of Medicine, Nursing and Health Sciences, NUIG

Abstract

Mesenchymal stem (or stromal) cells (MSC) have long been acknowledged for their ability to differentiate into several distinct mesenchymal lineages. However, they have inspired a great deal of interest more recently for their ability to display immunomodulatory effects. MSC have been reported to suppress T-cell proliferation *in vitro* by producing various soluble factors including prostaglandin E2 (PGE2), a product of arachidonic acid metabolism and/or contact-dependent signals. However, little is known regarding the effects of conditioned MSC medium on proliferation of the recently described Th17 subset of CD4+ T-helper cells. In the present study, we set out to determine whether the addition of exogenous Th-17 priming factors contributes to the immunomodulatory effects of MSC by measuring the anti-proliferative effect of conditioned media from MSC cultured under various conditions on CFSE-labelled CD4+ T-cells. Flow cytometric analysis revealed that supernatant generated from co-cultures of MSC and activated CD4+ T-cells resulted in potent suppressive conditioned media by inhibiting the proliferation of newly-activated CD4+ T-cells in contrast to conditioned media from MSC cultured alone or MSC co-cultured with un-activated T-cells. The presence of anti-IFN γ , anti-IL-4, IL-6 or TGF β did not have any additional or synergistic suppressive effects. The suppressive effect was still apparent at 66 hours following initial co-culture.

Results generated from this study may have implications for *in vivo* studies as we determined the optimum conditioned media. Also by measuring the duration of this suppressive effect we may be able to assess the optimum dosing frequency of MSC.

Thromboelastographic changes in cardiac surgery patients during temperature 'after-drop'

Darrell Martin (pre-med), Leo G. Kevin MD
FCARCSI

Dept of Anaesthesia and Intensive Care
University Hospital Galway

Disorders in haemostasis are common after cardiopulmonary bypass. These contribute to peri-operative blood loss and the extremely high rate of blood transfusion in cardiac surgery patients. Several factors contribute to coagulation abnormalities after cardiac surgery. These include large dose heparinisation, incomplete reversal with protamine, contact of blood with the extracorporeal circuit, and use of intra-operative red cell salvage which depletes clotting substituents. Hypothermia is also known to interfere with haemostasis. Hypothermia is utilised during bypass to protect organs from low-flow states. Before separation from bypass, the patient's blood is rewarmed to 36.5°C. After separation, the patient's blood temperature rapidly falls, however, due to redistribution of heat from the central compartment to peripheral tissues, a phenomenon known as 'after-drop'. In this pilot study I used thromboelastography (TEG), a dynamic measure of multiple aspects of clotting and thrombolysis, to evaluate the effect of after-drop on haemostasis. Six patients undergoing coronary artery bypass grafting or valve replacement surgery were studied. TEG was measured at separation, when the temperature was 36.5°C, and when the after-drop temperature reached 35.5°C. Values are expressed as mean ± SD. R time, the time to initiation of clot formation, was 6.3min ± 0.6 at rewarm vs 4.85min ± 0.8 (P<0.05) at after-drop. Maximum amplitude (MA), a measure of clot strength, was 55.4mm at rewarm ± 8.1 vs 61.8mm ± 10.8 at after-drop (P = 0.2). Although numbers are small, these results argue against a direct contributory effect of after-drop in haemostatic dysfunction and bleeding tendency in cardiac surgery patients.

The correlation between PSA and PSA density levels in the development and progression of Prostate cancer

Dympna O' Dwyer, Fergus Cafferty, Prof. Peter McCarthy
4th year

Department of Radiology, University College Hospital Galway

Background

Elevations in prostate specific antigen (PSA) can be caused by either serious conditions such as prostate cancer or benign conditions such as BPH. Therefore no test exists that is both highly sensitive and specific for prostate cancer.

Objective

We sought to research different levels of PSA and PSA density in our cohort of patients and develop an algorithm to calculate certain percentage risk of developing cancer.

Design and participants

We analyzed the data of 410 patients who underwent biopsies in the period of March 2010- May 2011 in the Department of Radiology, UCHG. Data analyzed included presence of abnormal clinical exams (enlargement/nodularity), Gleason score, prostate volumes, PSA and PSA density levels.

Results and conclusion

Patients with prostate cancer are older than those with negative biopsies. Increasing PSA levels are associated with increasing risk of malignancy. Progressive increases in PSA density are associated with an increased risk of cancer, and also an increased risk of more aggressive cancers. A threshold for assessing the risk of prostate cancer was not found but 100% of those whose density was 0.7 or greater had cancer. Larger prostate volumes are not associated with an increased risk. PIN was statistically demonstrated to be associated with an increased risk of prostate cancer. Abnormal examinations were not found to have a significant correlation with malignancy.

Oncological & cosmetic re-intervention in immediate and delayed breast reconstruction.

E McGrath, PS Waters, CA Malone, R McLoughlin, AJ Hussey, KJ Sweeney, MJ Kerin.

Introduction

Breast reconstruction is offered to all women requiring mastectomy for breast cancer as part of their surgical management. Re-intervention for oncological and cosmetic reasons depends on tumour characteristics, type and timing of reconstruction and adjuvant radiotherapy. The aim of this study was to examine risk factors for re-intervention in patients that underwent breast reconstruction in our institution.

Methods Data was collected from our prospectively updated patient database. Parameters such as tumour characteristics, type and timing of reconstruction, re-intervention and adjuvant radiotherapy use were recorded.

Results

Between January 2004 to April 2011 412 patients underwent breast reconstruction with average age of 48.6 years (27-83years). 358 were immediate and 54 underwent delayed reconstruction. 187 latissimus dorsi flaps (LD) with implants, 50 LD alone, 59 implant, 23 TRAM, 21 extended LD, 33 mastopexies, 25 local flaps and 4 DIEP were performed. Cancer recurrence rates were 5.1% (n=18) in the immediate group versus 5.6% (N=3) in the delayed group. Lymph node positivity and ER negativity accounted for tumour characteristics which were significant risk factors for oncological re-intervention ($p=0.019$, 0.015). Time to cancer recurrence was 16.5 months (1-53months). Implant reconstruction was found to be significant for cosmetic re-intervention. Timing of reconstruction was not significant. 227 patients had post-operative radiotherapy which was associated with 30% cosmetic re-intervention.

Conclusion Oncological and cosmetic re-intervention rates are comparable with international standards. However patients with ER negative and lymph node positive tumours must be monitored closely within the first 2 years to identify possible disease recurrence and the use of radiotherapy is a risk factor for cosmetic revision.

I Brachytherapy for Treatment of Localised Prostate Cancer at University College Hospital Galway- A Retrospective Review

Keane F, Sullivan F. Department of Radiation Oncology, UCHG

Background

Prostate Cancer is a significant cause of morbidity and mortality amongst Irish men. Over 500 deaths are attributed to Prostate Cancer annually in Ireland(1). In the two year period 2004-2006 Galway reported the highest prostate cancer incidence nationally(2), and elevated incidence in the West of Ireland is an ongoing trend. The use of ^{125}I brachytherapy has revolutionised the treatment of early-stage prostate cancer, however the practise is not yet as widespread in Ireland and little research exists reporting the Irish experience of brachtherapy.

Methods

Over 450 prostate brachytherapy recipients' information was collected and retrospectively analysed. Particular attention was paid to patients who received brachytherapy as a salvage treatment i.e. those patients who previously recurred biochemically following External Beam Radiation Therapy(EBRT). For all patients demographic details, TNM staging at diagnosis, biochemical recurrence (by the ASTRO and Phoenix definitions) and toxicity data at outpatient follow-ups were recorded including International Prostate Symptom Score(IPSS), erectile function and bowel toxicity.

Results

Outcomes for the first 250 patients will be presented, such that the minimum follow-up period for the cohort is 24 months. Of this group five patients received salvage brachytherapy, none of whom have since experienced biochemical recurrence. Biochemical Recurrence in those receiving brachytherapy as a monotherapy was also low with fewer than 5% having recurred at 2years follow-up. Toxicity levels were also very favourable compared to EBRT, with urinary toxicity emerging as the most common side effect. The results of this study reflect the growing role for brachytherapy in clinical practice.

(1)Central Statistics Office

(2) National Cancer Registry

Selection of patients for Isotope Directed Enhanced Axillary Sampling (IDEAS) for screen detected early breast cancer

FC O' Deasmhunaigh, PA Cronin, MJ Kerin, M Sheehan, KJ Sweeney
Department of Surgery, NUIG

Introduction Current practice in breast cancer management is for all positive sentinel lymph node biopsies (SLNB) to proceed to axillary lymph node dissection (ALND). Recent evidence suggests that SLNB is non-inferior to ALND for some patients with limited nodal burden. Isotope Directed Enhanced Axillary Sampling (IDEAS) in selected patients may be preferable to SLNB to avoid ALND.

Aim To preoperatively identify patients who have higher risk of nodal metastases that would benefit from IDEAS

Methods

All invasive breast cancers with clinically and radiologically negative axillae detected by Breastcheck Western Unit screening between September 2008 and May 2011 were included. All radiological and clinicopathological features were compiled. Data were analysed using SPSS 19.

Results 260 patients were identified with a mean age was 57.6 years. 197 (75.8%) patients had negative axillae confirmed following SLNB. Those with a positive SLNB (n=63) had a completion ALND. The majority of these patients with axillary metastases (n=60, 95.2%) had a limited nodal burden with only 1 or 2 nodes positive. Patients with nodal metastases had a higher clinical (p=0.007) and radiological (p=0.047) assessment score. The mean estimated radiological size of lesion was 16.0 +/- 13.9mm and increasing tumour size correlated significantly with nodal positivity (p=0.001). ER (p=0.02) and Her2/neu (p=0.049) receptor positivity also correlated with nodal disease.

Conclusion

Evaluation of preoperative tumour features may help identify patients with higher risk of nodal disease. IDEAS for these patients could be used to identify those with limited nodal burden that would not benefit from further ALND.

Angiogenic potential of clonal populations of human Mesenchymal stem cells

Scott J., Liew A., Shaw G., Murphy M., Barry F., O'Brien T.

School of Medicine, College of Medicine and Health Sciences, National University of Ireland, Galway. Regenerative Medicine Institute (REMEDI), National University of Ireland, Galway.

Introduction

Critical Limb Ischemia (CLI) is the most severe form of peripheral arterial disease. One third of CLI patients are not suitable for surgical revascularization – these 'no-option' patients have substantial morbidity and mortality and frequently have diabetes mellitus. Hence, new treatments are urgently required. Mesenchymal Stem Cells (MSCs) are a novel and exciting potential for inducing therapeutic angiogenesis. However, MSCs are heterogeneous in nature and the angiogenic potential of different clonal populations from the same donor is currently unknown. We hypothesize that MSC heterogeneity will allow for the isolation of clonal cell populations with enhanced angiogenic potential.

Methods

The angiogenic potential of three daughter clones and the parent clone from a single donor were determined. We performed *in vitro* angiogenesis and endothelial differentiation assay and determined the nature of angiogenic products in the secretome of these clones.

Results

Daughter clone 1 and 2, as compared to the parent and daughter clone 3, were highly angiogenic demonstrating the existence of clonal heterogeneity. We next went on to examine the ability of these clones to undergo endothelial differentiation and observed that these two clones also showed significant endothelial differentiation capability which was greater with clone 1. Clone 1 which has the greatest angiogenic and endothelial differentiation capacity secreted the greatest quantity of angiogenic factors.

Conclusion

MSC clones derived from a single human donor are highly angiogenic but individual clones vary in their angiogenic potential. This study suggests that therapeutic efficacy of MSC populations in ischemic states may be enhanced by the use of angiogenic clones.

Circulating *miR-497* as a Novel Minimally Invasive Biomarker for Breast Cancer

J.W. Walsh, A.M. McDermott, N. Miller, K.J. Sweeney, M.J. Kerin

Department of Surgery, National University of Ireland, Galway.

Introduction

The focus of attention in breast cancer diagnostics and therapeutics is now on the identification of a sensitive and specific circulating biomarker. Mi(cro)RNAs are a class of non-coding RNA molecules approximately 18-25 nucleotides long, notable for their stability and aberrant expression in cancer, highlighting their potential as minimally invasive biomarkers and potential therapeutic targets. A recent study (1) showed decreased expression of *miR-497* in breast cancer tissue compared to normal breast tissue when analysed at the genetic level. The aims of this study were to determine if *miR-497* was detectable in the circulation and to evaluate its expression levels in the breast cancer state.

Methods

Whole blood samples were obtained from 101 individuals comprising of breast cancer patients, disease-free controls and those with benign breast disease. RNA was extracted, cDNA was synthesised and RQ-PCR was performed to determine the expression levels of *miR-497*. Results were analysed using Q-Base Plus and Minitab V15.0.

Results

The mean age of the cancer, control and benign breast disease groups were 58, 51 and 46 years respectively. Using the 2-sample T-test, *miR-497* was significantly lower in breast cancer patients compared to healthy controls ($p=0.008$). Underexpression of *miR-497* was observed across all molecular subtypes.

Conclusion

miR-497 is detectable in the circulation and may act as a tumour suppressor in the carcinogenesis pathway. Furthermore, these findings imply that *miR-497* may have a useful role as a circulating biomarker in breast cancer.

Investigation of Medication non-reconciliation during the discharge prescribing process

Michelle Casey¹, Pat O'Brien², Laurence John Egan^{3,4}

1: School of Medicine, National University of Ireland, Galway.
2: Galway University Hospitals Medication Safety Coordinator.
3: Pharmacology and Therapeutics, School of Medicine, National University of Ireland, Galway.
4: Health Research Board Clinical Research Facility, National University of Ireland, Galway.

Grant Support: Clinical research fund, National University of Ireland, Galway

Background: Periods of transition between points of care represent a vulnerable time for patients for a number of reasons one of which is medication safety. The prevalence of medication inconsistencies documented at discharge and their potential to cause patient harm, warrants further investigation of medication non-reconciliation during the discharge process and its potential contributing factors.

Aims:

1. Identify the prevalence of and classify the types of medication inconsistencies between the different discharge prescription documents.
2. Investigate further the hypothesis of (Grimes, Duggan et al.2011), which identified potential contributing factors to medication non-reconciliation.

Methods: This study was an observational study of Cardiology patients discharged from hospital over a 5 week period from 22 June to 27 July 2011. Medication documentation at discharge was assessed for accuracy and congruency.

Results: Medication inconsistencies in a patients' medication documentation were observed in 69% of 81 cases analysed, involving 53% of 668 medications ordered. A correlation, significant at $p<0.001$ emerged between the total number of medications on discharge and the number of inconsistencies per medication order. . Failure to specify duration of therapy on the discharge prescription was the most common error type. Patients who had their discharge prescription written by a senior level doctor (SHO or Registrar) were more likely to experience a medication inconsistency (adjusted odds ratio 3.23, 95% confidence interval 1.11-9.36) compared with those written by an intern.

Conclusion: Medication discrepancies commonly occur during the hospital discharge process, the process itself is multi-factorial with a need for improvement strategies to address each contributing factor.

Atlantic DIP: Diabetes in Pregnancy: a comparative study of stress and wellbeing in women with established diabetes, gestational diabetes, and those without diabetes

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Introduction: Management of diabetes can be a significant source of stress for patients and may be exacerbated when combined with the experience of pregnancy and worries about the unborn child. We carried out a prospective study in women with pre-existing (Type 1 or Type 2) Diabetes (PDM), Gestational Diabetes Mellitus (GDM), and non-diabetic pregnant controls (NDM).

Method: The participants were 220 pregnant women- 34 with PDM, 78 with GDM and 108 NDM. Stress and wellbeing levels were evaluated using standardised psychological questionnaires; The Pregnancy Experience Scale; The Depression Anxiety Stress Scale; the Multidimensional Perceived Social Support Scale; the Illness Perception Questionnaire-Diabetes; the Diabetes Self-Efficacy Scale; the SF-8 and the Problem Areas in Diabetes Scale. We anticipated higher stress in diabetic women and a possible protective role of social support.

Results: We found a non-significant trend of increased stress and lower quality of life among diabetic women compared to NDM. Women with PDM perceived their illness as more threatening ($p < 0.05$) and having a higher impact on their lives than those with GDM ($p < 0.0001$). However, women with PDM also reported significantly greater self-efficacy in relation to their diabetes management compared to their GDM counterparts ($p < 0.05$). NDM participants reported higher perceived social support which may confer a protective role against psychological stress.

Conclusion: These preliminary results suggest that pregnant diabetic women perceive themselves as having a lower quality of life and higher levels of stress in pregnancy, especially women with PDM. This may indicate a need for psychological support in these patients.

Development of Novel Mobile Applications to Raise Public Awareness of Cardiovascular Disease Risk

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Purpose

Cardiovascular disease (CVD) is the most frequent cause of premature death in Irish adults. Most of the risk factors for CVD are modifiable and closely relate to the patient's lifestyle. The Croí MyAction preventive cardiology programme has been effective in addressing risk factors for CVD. With the widespread use of smartphones, mobile applications represent a novel way of orienting individuals towards healthier lifestyle choices. We wished to create an iPhone application that would educate and motivate individuals to reduce their risks for CVD.

Methods

After liaising with multidisciplinary clinical team members (nurse, physician, dietitian, exercise specialist) and convening a focus group which included patient representatives, an outline of the structure and content of the app was agreed.

Results

The app includes the following features: a "Heart Age" calculator, a summary of international guidelines for CVD prevention, dietary and physical activity trackers and an alcohol and cigarette consumption monitor. The app is designed to facilitate future extension of function with regular updates. The app is being submitted to Apple and will soon be available on the iOS App Store as a free download. A related app which uses a novel traffic light visual system for informing food shopping choices will be submitted separately.

Conclusions

It is envisaged that these apps will educate and assist users in achieving a healthier lifestyle. Based on user feedback, it is intended that the apps will be refined and expanded and a formal evaluation of their effectiveness will be conducted via an online survey.

The effect of statin use on PSA levels and the risk of prostate cancer in men attending a rapid access prostate assessment clinic.

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Department of Urology, UHG

Introduction

Many studies suggest HMG-coA reductase inhibitors (statins) have potential protective effects against cancer progression including the development of high risk prostate cancer. The aim of this study was to investigate if men taking statins had a lower PSA level and if they were less likely to develop prostate cancer.

Methods

We performed a retrospective study of men attending a rapid access prostate clinic over a 12 month period. These men attended for a TRUS biopsy as they had an elevated PSA or an abnormal DRE. We performed a multivariate logistic regression analysis to determine the effects of statin use on the diagnosis of prostate cancer and its effect on PSA levels and stage of disease.

Results

540 men underwent a TRUS biopsy over a 12 month period. Mean age was 66 years (range 44-82) with a mean PSA of 19.6 (range 0.4-204). 269 (49.8%) had a benign histological finding and 271 (50.2%) were diagnosed with prostate cancer. 109 (20.2%) men were taking a statin. Statins had no effect on PSA levels or the development of prostate cancer.

Conclusion

Our findings suggest that statin use is not associated with a reduction in PSA levels or has protective effects against the development of prostate cancer.

Mesenchymal Stem Cells and Breast Cancer

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Discipline of Surgery

Mesenchymal stem cells (MSCs) are multipotent stem cells, with the proven ability to specifically home to the sites of tumours and their metastases. MSCs thus have enormous potential for tumour-targeted delivery of therapeutic agents. However, recent evidence suggests they may also have negative effects in the primary tumour microenvironment. This study aimed to investigate interactions between MSCs and breast cancer cells in 3-dimensional culture. Three breast cancer cell lines (Sk-Br-3, MDA-MB-231 and T47D) were cultured both individually and in co-culture with MSCs on 3D scaffolds for up to 21 days. Media containing all factors secreted by the cells was collected at Day 3, 7, 10, 14 and 21. TGF- β 1 and CCL5 levels secreted by individual/mixed cell populations were quantified using ELISA. When cultured individually, CCL5 levels secreted by SK-BR-3, T47D and MSCs ranged from 5-10pg/mL, while the invasive MDA-MB-231 cells secreted higher levels (range 94-169pg/mL). Upon co-culture of MSCs with MDA-MB-231 cells, CCL5 levels increased dramatically, peaking at 2477pg/mL on day three. At later timepoints a significant increase was also observed (D7: 1587pg/mL, D14: 1120pg/mL, D21: 1157pg/mL). All cell populations secreted relatively high levels of TGF β -1 (MSC: 1184-3436pg/mL; SK-Br-3: 842-1111pg/mL; T47D: 1273-1326pg/mL, MDA-MB-231: 1177-2751pg/mL). Upon co-culture, TGF- β 1 levels decreased. MSCs clearly impact upon adjacent cell phenotype, potentially with cell type-specific outcomes. This may be exerted through changes in secretion of factors known to have a central role in breast cancer progression. Understanding MSC interactions with breast tumours is crucial to determine their true potential for tumour-targeted delivery of therapeutic agents.

Alcohol Consumption Patterns in a Cohort of Patients Attending a Primary Cardiovascular Disease Prevention Programme

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Excessive alcohol consumption is a risk factor for the development of cardiovascular disease (CVD). The alcohol consumption patterns of individuals at risk of developing CVD have not been well characterised. We describe the alcohol usage profile of individuals attending a 16-week lifestyle-centred CVD prevention programme.

Methods

A retrospective analysis of data from participants and their partners completing the programme was performed. Participants were at increased or high risk of developing CVD or had been diagnosed with type 2 diabetes or peripheral arterial disease. The following variables were examined: alcohol intake, and correlations between alcohol intake and blood pressure, lipids, glycaemia and waist circumference.

Results

There was a statistically significant reduction in alcohol consumption from initial assessment (IA) to end of programme (EOP) and at 1yr. Thirty percent of male and 16.2% of female participants reported weekly alcohol usage exceeding recommended levels. Median alcohol consumption for all patients consuming any alcohol reduced from 12 units at IA to 8 units at EOP and 7.5 units at 1yr ($p < 0.001$). There was a greater reduction in alcohol intake in male patients from IA to EOP ($p = 0.001$) and from IA to 1yr ($p = 0.038$). There was a positive correlation between baseline alcohol usage and blood pressure ($p = 0.032$), triglycerides ($p = 0.003$), fasting glucose ($p < 0.001$) and waist circumference ($p = 0.016$).

Conclusions

This study highlights the importance of alcohol education in primary CVD prevention programmes given the unhealthy alcohol usage patterns in this group and the reductions in alcohol consumption achieved during the lifestyle intervention.

Cumulative effect of multiple low penetrance variants on breast cancer risk

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Known genetic mutations account for 28% of hereditary breast cancer, with the remaining cases thought to be explained by a polygenic contribution of low penetrance variants. These variants, when present independently, may have negligible functional effect or confer a modest breast cancer risk but in combination may have a significant effect. Hence, we aim to evaluate the cumulative effects of three low penetrance single nucleotide polymorphisms (SNPs) previously identified as predictors of breast cancer risk in the west of Ireland cohort.

DNA extraction was performed on peripheral whole blood of 838 breast cancer cases and 330 healthy controls. Variant genotyping via polymerase chain reaction (PCR) was performed for *rs13281615*, *rs2981582* and *rs61764370*. Results were analyzed using Minitab 15 and SPSS 18.

In this study, the dominant pattern of inheritance was used for *rs13281615* and *rs61764370* with *rs2981582* as the recessive model. Only *rs2981582* was found to independently increase breast cancer risk ($p = 0.0095$, OR 1.58, 95% CI 1.2-2.2). The combination of two of three positive variants increases the risk of breast cancer ($p < 0.0001$, OR 2.25 95% CI 1.5-3.3). The association between variant positivity in all three SNPs and breast cancer risk however was not statistically significant ($p = 0.8929$, OR 1.071, 95% CI 0.4-2.9). Interestingly, a combination of one of three positive variants decreases breast cancer risk ($p = 0.054$, OR 0.74, 95% CI 0.6-1.0).

A combination of variants does affect breast cancer risk albeit in an unpredictable pattern which may be a consequence of gene-gene epistasis or gene-environment interaction which warrants further investigation.

Breast Cancer Stage at Presentation: A Longitudinal Study- Win Some Lose Some!

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Introduction

Breast cancer outcomes have improved secondary to early detection, and advances in treatment. It is not clear if stage at presentation changed over time? This study undertook an evaluation of the stage at presentation and trends in stage of breast cancer patients to a single breast unit.

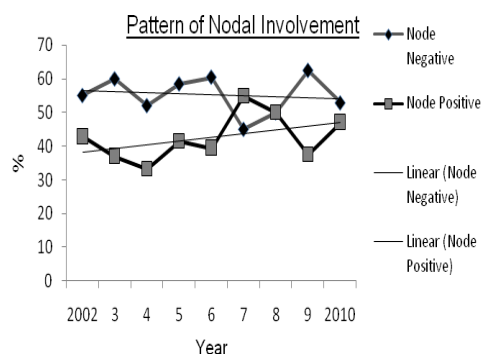
Methods

A 9 year retrospective ethically approved study of breast cancer patients at Letterkenny Hospital from 2002-2010 was undertaken. Patients stage, demographics, grade and hormone receptor status, were obtained. Nodal status and metastatic disease were documented.

Results

Of 578 patients, mean age 60.7 years \pm 13.8 (range 28-96), 538 had complete staging, 33% with stage 1, 40% with Stage 2, 18% with stage 3 and 9% stage 4. While DCIS had increased from 6% to 15% over 9 years, stage 4 metastatic disease at presentation increased from 4% to 9%. Grade 1 was present in 13.7% (70), grade 2 in 53.4% (274), and grade 3 in 32.9% (169). Oestrogen receptor status was positive in 81% and progesterone receptor in 67%.

Node positive and negative patterns are shown in Figure 1, with 47.1% of patients remaining node positive in 2010. There is a trend towards increased node positivity.



Disability is common and Under-reported in patients with Essential Tremor – a case series.

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Introduction

Essential tremor (ET) is a very common neurological condition. Previous studies have shown that patients with (ET) report a diminished quality of life (QoL) compared to control populations. However it remains uncertain whether patients' QoL is influenced directly by the severity of their tremor or whether other factors in addition to the movement disorder contribute to poor QoL status. This study aims to elucidate, both qualitatively and quantitatively, how ET affects quality of life.

Methods

Of the 132 patients with possible ET (\leq 80 years) attending the Neurology Clinic at Galway University Hospital, 50 agreed to participate in face-to-face interviews. Assessment also included the ET-specific QoL scale (QUEST) and the Fahn Tolosa Marin tremor rating scale.

Results

38 patients fulfilled our modified international criteria for ET (MDS). The most prevalent problems reported were: embarrassment at social events or when eating out (64.9%); drinking/ carrying glasses or cups (48.6%); tremor worsens if people are looking at it (40.5%); worse if anxious/ nervous (40.5%); eating and spilling food (37.8%); avoiding social and other situations (35.1%). Mean scores in the physical and psychosocial components of QUEST were 33.6% and 19.88% respectively with a mean difference of 13.67% ($p < 0.003$).

Conclusion

This is the first study to use a disease-specific QoL scale matched with a tremor severity scale for this purpose. ET causes a substantial degree of physical and psychosocial disability. However, psychosocial distress does not seem to correlate with physical tremor severity data meaning that such data may underestimate the overall impact on QoL.

Quantifying Physical Activity Energy Expenditure Using Combined Heart Rate and Movement Sensing in Severely Obese Individuals.

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Year:4MB3

Although physical activity energy expenditure (PAEE) is a critical determinant of health, it is difficult to measure. A novel method to quantify PAEE using combined heart rate and movement sensing (Actiheart®) has been validated in healthy adults, but the feasibility of acquiring these measures in morbidly obese individuals (Body Mass Index >40kgm⁻²) is not known. We sought to determine whether the Actiheart® device had sufficient sensitivity to detect changes in heart rate and movement over a six day period in severely obese patients attending our bariatric medicine service.

The Actiheart® device was attached to the anterior chest wall with two standard ECG electrodes, worn continuously for six days. Aerobic fitness (VO₂max) was estimated using a submaximal step test, which was also used to individually calibrate heart rate to energy expenditure.

Sixteen morbidly obese patients (3 males) were recruited over four weeks. Mean weight was 130.7±24.6Kg, BMI was 48.3±6.7Kg m⁻² and age was 42years (range22–66). Estimated VO₂max was 27.7±7.3mlmin⁻¹m⁻², while mean proportion of time that the device was worn was 22.3±6.1hours per day. Overall PAEE was 46.6 (range 27.4–98.4) KJkg⁻¹day⁻¹.

Actiheart® measures of PAEE are feasible in this cohort, so the quantification of changes in PAEE after weight loss interventions can begin in earnest.

An evaluation of patient reported outcomes following breast reconstruction utilizing Breast Q

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*2MB3

Introduction

Breast Q questionnaire measures patient's perceptions following breast reconstruction using quality of life and satisfaction scores. This study assessed patient reported outcomes following mastectomy and reconstruction utilizing Breast Q.

Methods

All consecutive Letterkenny Hospital patients undergoing mastectomy and breast reconstruction between August 2008 and February 2011 were invited to complete Breast-Q. Collected data included: age; presenting complaint, height, weight; type of operation. Written consent was obtained from patients following ethical approval. RUMM 2020 program evaluated satisfaction; 0 is very dissatisfied to 100 very satisfied.

Results

30/33 (91%) patients completed Breast Q; mean age 43±11 (range 29-64); mean BMI 27.3 ± 5 (range 21.7-43.1). 27 patients were symptomatic, and 3 were image detected. 23 had a latissimus dorsi reconstruction, 11 of these with implant augmentation, 5 had a DIEP and 2 implant only reconstruction. Outcome data are shown below in Table 1.

Question	Pre-Operative Mean ± sd	Post-Operative Mean ± sd
Satisfaction with Breasts	66 ± 20	64 ± 18
Psycho-Social well-being	67± 16	69 ± 17
Psycho well-being: Chest	81±14	81 ± 13
Psycho well-being: Abdomen	87 ± 15	88 ± 9
Sexual well-being	52 ± 28	54 ± 24

Conclusion

This study, the first to use Breast Q in Ireland, identified outcomes as good as, if not superior to international averages. Patients noted the post-operative preservation of satisfaction with breast and psycho social well being. Breast Q could help form a template for national benchmarks in patients undergoing mastectomy and reconstruction.

Investigating Pain and Depression Co-morbidity in rat models of Pain and Depression

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Supervisor: Dr. Michelle Roche

Introduction

There are many studies investigating pain and depression, despite this, the complex mechanism which links them together is not fully understood. The present study investigates the effects of chronic inflammatory pain on depressive behaviours and the effect of depression on neuropathic pain. In addition gender differences were also monitored, and if chronic amitriptyline treatment reversed affective-behavioural pain responding.

Materials and Methods

The chronic pain models underwent a series of behavioural tests including Open Field (OF) and Elevated Plus Maze (EPM) for anxiety behaviours, Forced Swim Test (FST) for depressive behaviours and Place Escape Avoidance Paradigm (PEAP) for affective-behavioural pain response, whilst the depression models only underwent the PEAP. All tests were recorded on DVD and rated with the aid of the Ethovision 3.1 programme.

Results

The chronic inflammatory pain models exhibited no difference in anxiety, depressive behaviours or affective-behavioural pain responding in PEAP between CFA and their non-CFA treated counterparts. Inconsistent with previous research, no significance in anxiety, depressive behaviours and affective-behavioural pain responding in PEAP between genders were found. Consistent with previous findings the Olfactory bulbectomized (OB) and Spinal nerved ligation (SNL) neuropathic pain models, showed that depression causes an increase in threshold for evoked mechanical pain and amitriptyline causes an increase in sensitivity in the contralateral paw, whilst having no effect on the mechanical allodynia on the ipsilateral paw.

Conclusion This study demonstrates a complex link between chronic pain and depression. This could be modelled pre-clinically, providing a path for future investigations and development of potential treatments.

Analysis of Pressure Stats® Measurements Collected as Part of the West of Ireland Diabetic Foot Study

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2. Diabetes Centre, GUH and Galway PCCC, HSE West
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7. School of Podiatry, NUI Galway

Abstract

Elevated plantar pressure (EPP) is a risk factor for diabetic foot ulceration but is difficult to measure and define clinically. The PressureStat® device enables quantification of EPP by creating a carbon foot print. PressureStat® measurement was part of the foot assessment in the West of Ireland Diabetes Foot Study. 530 pairs of PressureStat® measurements were collected. We aimed to determine (1) the prevalence of EPP and arch abnormalities, (2) if EPP is commoner in neuropathic patients and (3) if EPP can predict future ulceration. Based on the definition used (>6.5kPa of plantar pressure) 76% of individuals had ≥1 area of EPP. The mean number of EPP sites was 3 on the right foot and 4 on the left. 8% had EPP based on a definition of >10 sites with pressure >6.5kPa. The commonest EPP sites were the first and fifth metatarsal heads (50% and 28% respectively), and the hallux (44%). Pes cavus, pes planus and neutral feet were present in 6%, 9% and 80% respectively. Insensitivity to the 10 gram monofilament, an indicator of sensory dysfunction, was commoner among individuals with vs without EPP (25% vs. 15% for >6.5kPa; p=0.043; and 48% vs 21% for EPP at >10 sites; p<0.001). EPP was not associated with abnormal vibration perception threshold or neuropathy disability score. EPP defined as >10 sites was associated with future risk of ulceration (OR 10.4; 95% CI 2.7-40.6). We conclude that measurement of EPP adds value to diabetic foot assessment in a research setting.

The assessor being assessed; Outcome of pre-clinical communication v.s. clinical skills using NUIG's OSCE Management Information Systems

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Background

Objective Structured Clinical Examinations (OSCEs) are routinely adopted for high stakes assessment in medical education. In most OSCEs low level technology is used to capture, analyse and produce results. We describe an OSCE Management Information System (OMIS) to streamline the OSCE process and improve quality assurance. Students pass through a series of timed stations in which they are expected to demonstrate specific skills. The purpose of this study was to appraise the outcome of consecutive communications skills assessed in multiple stations over multiple years.

Method

OMIS was developed to capture OSCE data in real time using a Web 2.0 platform in PHP/MySQL. Data of OMIS were extracted in Excel for further analysis in SPSS. We evaluated consecutive communications skills in OSCEs of the first, second and third medical year. Communication skills items, communication skills band and standard setting in Global Rating Scores were correlated. Results: Communications skills are assessed in 70% of all stations for yr 1, 2 and 3 OSCEs. The item/total correlation coefficient varied from 0.01 to 0.73 (non to moderate). The relationship between the communication skills band and the Global Rating Scale correlations varied from 0.554 to 0.743 (poor to moderate) for station 1 to 4 in year 1. In contrast, the values for clinical skills band to the Global Rating Scale range from 0.735 to 0.925 from station 1 to 5 for year 1 (moderate to high).

Conclusions

Communication skills as such, compared to different clinical skills are over assessed. Communication skills are not specified according to disciplines and are repeated in almost every station. Various clinical skills are only assessed

once per OSCE per year. We recommend further specification of communication skills per year and per discipline.

Sarcopenia – an under-diagnosed component of Inflammatory Arthritis?

(1)Ms. Sharon Cowley; (2)Ms. Aoife McPartland; (3)Dr. John Doherty; (4)Dr. Bryan Whelan; (5)Dr. Carmel Silke. Completed in Sligo General Hospital Rheumatology Dept. and Our Lady's Hospital Manorhamilton.

Department(s)/Institution(s): (1)School of Medicine NUIG; (2)DXA Dept, Our Lady's Manorhamilton; (3)Dept. of Geriatrics Sligo General Hospital; (4)Rheumatology Dept Sligo General Hospital; (5)Rheumatology Dept Sligo General Hospital

Sarcopenia is defined as a progressive and generalised loss of skeletal muscle and strength either age or disease activity related or both.¹ The aim of this study was to assess sarcopenia in inflammatory arthritis. Patients attending North Western Rheumatology Unit (NWRU) were invited to participate in a study consisting of total body composition analysis, muscle function and quality of life assessment. Sarcopenia was quantified as appendicular skeletal mass divided by height squared (ASM/H^2) and considered present if the figure was two standard deviations below the mean for a population of young adults as based on the Rosetta study.² There were 44 subjects including (24 inflammatory arthritis (IA) cases and 20 controls). There were no significant differences in age or gender distribution between the 2 groups. 20% of patients in the inflammatory group had sarcopenia compared to none of the controls. Muscle function was also considerably reduced in those with inflammatory arthritis. The mean maximum dominant arm grip strength for inflammatory arthritis patients was 7.96kg while the mean for the controls was 11.45kg ($p=0.002$). Inflammatory arthritis patients were also noted to have an increased history of fractures compared to controls; 20.8% vs. 5% ($p=0.001$). Health Assessment Questionnaire scores were much lower in the IA group and reduced ASM/H^2 and grip strength correlated to a reduced HAQ score; ($p=0.006$ and 0.001). Sarcopenia is much more common in IA patients versus controls and correlates with reduced grip strength and quality of life in these patients.

Association of Serum Fibrinogen with Total and Cardiovascular Mortality among Subjects with Normal and Reduced Kidney Function in the General Population

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Introduction

The contribution of novel thrombotic factors to overall cardiovascular (CV) risk in chronic kidney disease is unclear. This study explored the association of serum fibrinogen with total and CV mortality in the setting of reduced kidney function.

Methods

A cohort of 8,494 subjects age >40 were identified from the Third National Health and Nutrition Examination Survey (1988-1994). Vital status was obtained through linkage with the National Death Index through to 2006. Serum fibrinogen levels (mg/dL) were compared across categories of estimated glomerular filtration rate (eGFR) (<60, 60-90, >90 mL/min). Weighted multivariable Cox regression modelled relationships of fibrinogen in quartiles (Q1; 0-261 [referent], Q2; 261-305, Q3; 305-356, Q4 >356 mg/dL) with total and CV mortality.

Results

Serum fibrinogen levels correlated inversely with eGFR ($P<0.001$); mean (\pm SE) values were 298 (2.9), 305 (2.8), 352 (6.3) in each lower GFR category. During 10-year follow-up 9.7 % died with 4.4 % from CV causes. Increasing quartile of fibrinogen was associated with higher total [RR=1.00, 1.21 (1.00-1.48), 1.90 (1.60-2.27), 3.32 (2.69-4.11)] and CV mortality [RR=1.00, 1.36 (1.02-1.82), 1.94 (1.54-2.44), 3.78 (3.05-4.68) respectively]. Adjusting for Framingham factors and eGFR, these relationships were partially attenuated [For CV mortality: RR=1.00, 1.18 (0.88-1.59), 1.43 (1.08-1.91), 1.89 (1.50-2.38) respectively].

Conclusions

Serum fibrinogen levels are higher among individuals with kidney impairment and contribute to increased total and CV mortality independent of Framingham risk factors and level

of kidney function. Strategies that achieve a reduction in fibrinogen levels may lead to improved survival in these high-risk patients.

Impact of bladder derived acellular matrix, growth factors and extracellular matrix constituents on the survival and multipotency of marrow derived mesenchymal stem cells

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Institute of Medical Sciences, University of Toronto, Canada.

Department of Paediatric Laboratory Medicine and Pathobiology, University of Toronto, Toronto, Canada

Objective

We investigate the effect of bladder derived acellular matrix (ACM) on bone marrow mesenchymal stem cells (BM-MSC) growth, survival and differentiation, and evaluate the effect of collagen I and IV on BM-MSC differentiation potential to SMC.

Methods

BM-MSC isolated from CD1₁ mice were characterized by surface markers and differentiation into different lineages. BM-MSC SMC potential was further evaluated in stem cell medium alone or supplemented with TGF- β 1 and recombinant human platelet derived growth factor (PDGF-BB) on plastic, collagen I and IV using western blot. Furthermore, BMMSCs were seeded on porcine derived ACM-fortified with hyaluronic acid and cultured in Mesencult+growth factors, bone, or fat induction media for 3 weeks. Seeded constructs were evaluated by H&E, Ki67 assay, Oil red O and Alizarin red stain. SMC differentiation was semi-quantified via immunohistochemistry.

Results

BM-MSCs differentiated into fat and bone when induced. In Mesencult, BM-MSCs differentiated into SMC, expressing α -SMA, calponin and MHC. BM-MSCs cultured on collagen I and IV reduced expression of SMC and MHC compared to plastic.

On ACM-HA, BM-MSCs maintained multipotent state by differentiating to bone and fat when induced. In Mesencult, BM-MSC-seeded ACM-HA expressed α -SMA, calponin and MHC. TGF- β 1 and PDGF-BB enhanced SMC differentiation on collagens and ACM-HA.

Conclusion:

SMC proteins expression by BM-MSC varies depending on culture substrate. SMC markers are expressed higher on plastic and lower on collagen I, IV and ACM-HA, suggesting these substrates preferentially maintain undifferentiated state of BM-MSC, which could be advantageous for incorporation of cell seeded grafts to permit host modulation of tissue regeneration.

POSTER PRESENTATIONS: ABSTRACTS

Nomograms in Breast Care: Current State of the Art

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Introduction

Nomograms facilitate enhanced information and treatment pathways by providing accurate predictors of both treatment and outcome in Breast Cancer. Few if any studies have categorised breast nomograms. The aim of this study was to categorise and provide a clinically relevant stratification of nomograms in breast cancer care.

Methods

An ethically approved study was undertaken at Letterkenny General Hospital in July 2011 evaluating published nomograms in breast care, categorizing them into nodal assessment, oncology relating to neoadjuvant and adjuvant therapy, radiation oncology, radiology, metastatic prediction and staging. Computerized and manual searches via Pubmed, MD Consult was undertaken. The citation rates and presence of internal and external validation was assessed. Models other than nomograms were not included in the study.

Results

33 nomograms relating to breast cancer care were identified. 33.3% related to surgical strategy, 30.3% to oncology, 27.3% to survival and prognostic features 6.1% to radiation oncology and 3% to breast radiology. The mean citation rate was 24.2 ± 46.7 (range 0-227). The three most cited nomograms related to prediction of additional nodal metastasis in sentinel node positive patients, pathologic complete remission and survival after preoperative chemotherapy and outcome following primary chemotherapy, with a mean of 123.3 ± 98.9 citations. Internal and external validation occurred in 31/33(94%) and 3/33(9%) respectively.

Discussion This study, one of the first to categorise breast nomograms, identified a comprehensive set of predictive models throughout the different aspects of delivering breast cancer care. Access to categorical nomograms may facilitate subspecialty knowledge and care in Breast Cancer.

A Retrospective Study of Patients in Intensive Care on Continuous Veno-Venous Haemofiltration; Analysis of Anti-Coagulation

Andrew Carroll¹; Dr. J. Bates; Dr. David Lappin
¹ 4th year Medical student
Completed in the Intensive Care Unit University Hospital Galway

Introduction

The goal of anti-coagulation therapy is for optimal filter performance to enable efficient CVVH therapy in patients with acute kidney injury in an ICU setting. The aim of this study is to gather data on dialysis filter performance using the GUH heparin regimen. It was anticipated that the results from this study would support a switch to a citrate-based anticoagulation regimen, which has been shown to result in longer filter life, although about which safety concerns have been expressed. Once implemented the efficacy and safety of the citrate-based regimen will be audited after one year, thus completing the audit loop.

Methodology

Patient information was gathered retrospectively from the ICU archives. All patients who received CVVH while in ICU were included and the reasons for a filter change or discontinuation of dialysis (events) were collated.

Results

400 events occurred in 88 patients treated with CVVH. 36.5% of events were due to elective discontinuation of CVVH while 63.5% of events were non-elective due to a clot in the dialysis filter. The mean duration of dialysis was 23.041 hours. 60.8% patients were anti-coagulated with heparin while 37.8% received no anti-coagulation. The mean dialysis duration for those events ceased non-electively was shorter (20.563 hours) than events ceased electively (27.353 hours).

Conclusion

Our duration of dialysis is comparable to other studies using heparin in CVVH. However it is much lower than comparable analysis if citrate-based regimens.

Prevalence and associations of metabolic syndrome in patients attending psychiatric day centres

Anna Gubbins, John Lally, Colm McDonald

Aim

The metabolic syndrome is associated with increased morbidity and mortality secondary to cardiovascular disease and has been linked to schizophrenia and to the use of antipsychotic medication. In this study the prevalence of metabolic syndrome and the extent to which it is screened for was ascertained in a broad sample of individuals with chronic enduring mental illness attending community psychiatric day centres.

Method

100 participants with a history of chronic mental illness and who were attending community psychiatric centres were recruited over a four week period. The participants were interviewed and investigated using physical assessments, comprehensive laboratory testing and review of medical records.

Results

Of the 100 participants, 55% met the criteria for metabolic syndrome. There were similar prevalence rates for psychotic and non-psychotic disorders. The use of antipsychotic medication, high-dose antipsychotic medication and antipsychotic polypharmacy were not significantly associated with the metabolic syndrome. Forty four percent of the patients had not been screened for metabolic parameters in the previous 12 months. Of these, 43% met the criteria for metabolic syndrome.

Conclusion

Chronic enduring mental illness is associated with high prevalence rates of metabolic syndrome regardless of diagnosis or the use of antipsychotic medication.. A substantial proportion of this cohort of vulnerable patients carry cardiovascular risk factors that remain unidentified. Metabolic risk factors should be regularly screened for and intensively managed in patients with chronic enduring mental illness, in order to reduce their risk for cardiovascular morbidity and mortality.

Evaluating the Need for Trans-Catheter Aortic Valve Implantation (TAVI) in Patients with Symptomatic Aortic Stenosis in the West of Ireland that are High Risk for Conventional Surgery

Bríd Galvin, 4MB3

Research conducted: Department of Cardiology, GUH
Supervisors: Dr. Faisal Sharif, Professor Ciaran O'Neill

Surgical valve replacement is the standard treatment of aortic stenosis. However, the number of octogenarian patients is increasing. TAVI has emerged as an alternative treatment for these patients who have unacceptably high risk. The database of aortic valvuloplasty patients was obtained from the cardiology department. A list of patients with symptomatic aortic stenosis, >75 years, no previous aortic valve surgery and who require aortic valve replacement but have higher surgical mortality was requested from HIPE. A patient list was requested from the cardiologist who performed TAVI on patients in Dublin. Cost analysis was performed using the number of admissions in the past two years, length of stay per admission, number of outpatient visits, echoes and valvuloplasties per patient.

The finance department gave an estimated cost for each activity. Patients were contacted and asked to fill out EQ5D QOL questionnaire. The Euroscore and STS risk calculator were both used to calculate surgical risk. The mean age of the patients was 85.2. The mean total cost in the past two years was 16,417 EUR per patient. When patients were asked their health state on a scale of 0 to 100, the mean response was 54. There was a strong negative correlation when the relationship between perceived health state and total cost was investigated using Pearson product-moment correlation coefficient; $r = -0.69$, $n = 19$, $p = 0.003$. The mean standard euroscore was 10. The mean logistic euroscore was 18.18. The mean STS risk of morbidity and mortality was 18.9%.

A prospective observational study of neonatal scalp trauma following delivery with the KiWi OmniCup device.

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Objective

To determine the rate of neonatal scalp trauma outcomes associated with the Kiwi™ Omnicup Vacuum assisted delivery system compared with other methods of assisted vaginal delivery.

Methods

A prospective observational study was conducted over two months in the maternity unit at UCHG. We recorded a number of perinatal details including the indication for instrumental delivery, the instrument used, the grade of the operator and the infant scalp trauma sustained. Infant scalp trauma was recorded independently by an undergraduate research student, with relevant input from UCHG Neonatologists.

Trauma was graded as follows; 0 indicated no trauma, 1 indicated minor trauma (abrasions and bruising only), 2 indicated moderate trauma (lacerations) and 3 indicated severe trauma (severe scalp lacerations, subgaleal haemorrhage and cephalohaematoma). Descriptive statistical studies, looking at frequencies and percentages were carried out with the Predictive Analytics SoftWare (PASW) statistics programme.

Results

Of 67 instrumental deliveries, 42 (62%) were attempted KiWi deliveries, Neville Barnes forceps (NBF) accounted for 19 (28%) of deliveries, the Metal Cup accounted for 4 (6%) of deliveries and the Silc-Cup ventouse accounted for 2 (3%) of all instrumental deliveries. 10 cases of double instrumentation occurred whereby 9 were Kiwi™ Omnicup Vacuum and NBF combinations. Of 10 cases of double instrumentation, the need for Emergency Lower Segment Caesarean Section was required in 2. Failure to deliver vaginally occurred in 9 (21%) of attempted Kiwi deliveries and in 28% of the total instrumental delivery group. This is compared with failure to deliver vaginally in 2 (10.5%) of attempted NBF deliveries and in 3% of the total instrumental delivery group. Infant scalp trauma, ranging from mild moderate to severe, occurred in 36 (85%) of the KiWi group and 12 (63%) of the forceps group. In the total instrumental delivery group the KiWi Omnicup Vacuum was associated with infant scalp trauma in 53% of cases compared with 18% of NBF

instrumentation. Also severe trauma occurred with KiWi Omnicup use only with 2 reports of cephalohaematoma.

Conclusions

There is a significant risk of infant scalp trauma and failure to deliver with the KiWi™ Omnicup compared with other methods of instrumental vaginal delivery contrary to reports in recent literature. However, this study is ongoing and these are preliminary findings.

A Pilot Study to Test Methods and Likely Outcomes of an Upcoming Follow-Up to the SPHERE Study

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Introduction & objectives

A six-year follow-up study was piloted on a sample of 82 participants of the 2005-2007 SPHERE study, the largest community-based non-pharmaceutical trial ever conducted in Ireland.

This pilot aimed to predict uptake, test methodology and anticipate overall feasibility of a larger, upcoming HRB-funded project to assess long-term effects of the 18-month SPHERE intervention for patients with coronary heart disease.

The pilot sample comprised 41 intervention and 41 control patients, from four General Practices in the East and North-West of the country.

Methods

Opt-in consent was sought by post. Data were collected from computerised or hard-copy files in the four practices. Death certificates were sources from the General Register Office. Outcomes included cardiovascular and all-cause mortality, history of health service usage, prescribed cardiovascular medication, risk factors and general cardiovascular health since the conclusion of the main study. Data were analysed using SPSS.

Results

Of the 70 surviving and contactable patients, 56 provided consent. Data were collected for 49 patients. Many patient consultation records were inadequate for the purpose of collecting all the proposed information. Further difficulties were encountered sourcing chart information on deceased patients. After six years,

intervention patients showed increased practice attendance, decreased prescription of cardiovascular medication and fewer deaths.

Conclusion

The findings of this pilot study suggest that, although complex, it will be feasible for the upcoming SPHERE follow-up study to address the intended research question. Recommendations are made for maximising recruitment, consent and data quality in the main follow-up study, which commences in November 2011.

Nodal Ratio as a prognostic indicator for breast cancer

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Department of Surgery

The data of nearly 17,000 patients from the Shire Breast Cancer database was used to investigate lymph node ratio as a prognostic indicator for breast cancer. There are prognostic calculators available that utilize lymph node status e.g. Adjuvant! Online, PREDICT and Nottingham Prognostic Index but do not incorporate nodal ratio. The Galway Index of Survival (GAINS) was designed in an attempt to be a stronger predictor of survival than the prognostic calculators which base lymph node involvement solely on the number of positive nodes. GAINS incorporates lymph node ratio into the calculation of overall survival after 5 years. Other variables from which GAINS is constructed are; grade, stage and ER status of the tumour. Originally the formula for GAINS was $GAINS = 1.28*NR - 0.01*Age + Stage + if (Subtype=Her2, -.62, if(Luminal A, -0.93), if(Luminal B, -0.20) or if (Basal, 1)$ which incorporated different tumour subtypes e.g. Her2 and Luminal A/B, however upon further analysis it was decided that ER status was a better predictor of survival. An "App" for i-Phone was how GAINS was brought into digital life. The app includes an option to calculate Nottingham Prognostic Index (NPI), Galway Prognostic Index (GPI), as well as being able to calculate GAINS. Currently, the app is solely for research purposes and the information is to be entered by a health professional with experience in oncology. A legal disclaimer was written to ensure no assumption of responsibility, misuse or otherwise of the information provided in the app. The results are currently being validated.

To determine whether endoplasmic reticulum (ER) stress proteins could be useful as biomarkers in patients with Multiple Sclerosis (MS).

Eibhlin Higgins.

Background

Several pathogenic processes such as oxidative stress, inflammation and excitotoxicity may interfere with normal protein folding in the ER, resulting in accumulation of unfolded proteins leading to activation of a stress-signalling pathway known as the unfolded protein response or UPR. This is a pro-survival mechanism but, under conditions of prolonged stress, may result in apoptosis. Proteins associated with this pathway have been shown to be increased in MS lesions [1] and there is a possibility that the components of the pathway could be detected in bodily fluids. To test this hypothesis, saliva samples were collected and the presence of ER stress proteins examined.

Methods

There were 97 participants in the study, 48 patients with MS, 25 with other neurological conditions and 24 normal control volunteers. Dot Blot analysis was carried out on the saliva samples to assess levels of "ER stress protein X". The dot blot images were quantified using Image J software and statistical analysis was performed using the Kruskal Wallis test.

Results

The results did not have a normal distribution, although the median value for ER stress protein X was higher in the MS group than the neurological and non-neurological controls, the p value was not significant (p = 0.193).

Conclusion

Further experimentation is necessary to determine whether ER stress proteins could be valuable as biomarkers. Technical difficulties may have affected the results during the Dot Blot procedure and analysis of the results.

Hepatitis C treatment outcomes in a clinical practice setting: a retrospective study

Eimear O'Brien

Introduction

The worldwide prevalence of Hepatitis C in 3% ⁽¹⁾, with 350,000 related deaths annually⁽²⁾. Clinical trials indicate viral clearance for genotype 1+4 at 50% and 80% for types 2+3 with available anti-viral therapies ⁽³⁾. Our aim is to see if these results are achieved in clinical practice.

Methods

We analysed clinical and nursing data for patients treated in a single hepatology unit. Data collected included virus genotype, anti-viral treatment type, treatment outcome -sustained virological response (SVR) and gender. The data was analysed using SPSS.

Results

101 patients (55 males) were treated, 6 twice, giving a total 107 treatments. Genotype 1+4 had an SVR of 48% and genotype 2+3 an SVR of 92%. The source of infection changed between 1994-2010. In 1994, 100% of infection came from blood products. In 2010, 86% were infected through IV drug use (IVDA). Source of infection had an impact on the treatment outcome (SVR): Needle stick injury 100% SVR, IVDA 85% SVR, blood transfusions 71% SVR, Anti-D 46.15% SVR. Peg-interferon and ribavirin had the highest SVR rates of 79% when compared to ribavirin and interferon (70.97%) and interferon only (38%).

Conclusions

Results achieved in clinical trials can be achieved by a dedicated staff in a clinical setting. The change in the source of infection mirrors the change in our patient demographic profile and an increase in IV drug use. Newer treatments have a higher SVR.

The prevalence of missing data among patient referrals with suspected early inflammatory arthropathies

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Introduction

Ireland has too few rheumatologists. There is a perception that this is the main barrier to access and appropriate care. Early intervention in patients with inflammatory arthritis improves prognosis and reduces disability. Currently patients with suspected gout, ankylosing spondylitis, osteoporosis, juvenile arthritis, connective tissue disease and shoulder problems have separate, specific management pathways. The remaining referrals are deemed 'urgent' or 'routine'. Presently 660 patients are on the urgent waiting list, dating back to October 2009. Providing accurate and critical information in the referral expedites this process, and improves the efficiency and delivery of care.

Aim & Method

To examine the frequency of missing key information among urgent referral letters.

We reviewed 457 patient referral letters looking for the presence of 7 key components based on the National Early Arthritis Referral Form: joint pain, objective swelling, early morning stiffness, CRP and/or ESR, rheumatoid factor, CCP and imaging.

Results

Only 5 (1%) of letters referred to all of these key features. 293 (64%) made no reference to 4 or more features.

Table 1: Prevalence of Critical Components Among Referral Letters

Disease Features	Feature Present (%)
Pain	433 (95)
Objective Swelling	223 (49)
Rheumatoid factor	187 (41)
CRP	168 (37)
ESR	146 (32)
Early Morning stiffness	119 (26)
Imaging	106 (23)
Anti CCP	100 (22)

Conclusion

The majority of referrals for an urgent rheumatology consultation failed to provide critical patient information. This impairs appropriate triage of patients and creates inefficiencies in patient care. Education and use of the National Early Arthritis Referral Form could help improve these communications.

Positive predictive accuracy of a novel non-linear algorithm to detect the onset of arrhythmias in a population of ischaemic heart disease patients with implantable cardiac defibrillator.

Emma Samijono; Supervisor: Dr. Faisal Sharif

Objectives

To evaluate the positive predictive accuracy of a novel non-linear algorithm based the EMD (Empirical Mode Decomposition) method. The algorithm performs Heart Rate Variability (HRV) to quantify changes in autonomic nervous system regulation to detect the onset of arrhythmias in a population of ischaemic heart disease patients with implantable cardiac defibrillator (ICD).

Background

The main reason a patient is put on ICD is to prevent sudden cardiac death (SCD). SCD may have resulted from ventricular arrhythmias such as ventricular fibrillation or polymorphic ventricular tachycardia¹. Ischaemic cardiomyopathy is very common worldwide and it predispose patients to arrhythmias. The current European guideline suggests that every patient who has ejection fraction less than 35% to have ICD². However, ICD carries a huge cost and there is a doubt that every patient with ICD benefit from it.

Methods

We performed heart rate variability using the non-linear algorithm on 21 randomly selected ICD (intra-cardiac defibrillator) patients with ischemic cardiomyopathy from Galway,Ireland. 12 patients without any ventricular arrhythmias and 9 patients that have experienced either or ventricular tachycardia or ventricular fibrillation previously. 3-lead ECG data was collected from Holter monitors for 24 hours from them. The RR interval (beat interval) series were extracted. The algorithm was then applied to 21 patients blindly, patients were classified as positive (arrhythmia episodes) or negative (no arrhythmias).

Results

Most of the patients did not have an arrhythmia (VT/VF) detected; out of 8 patients with previous episode of VT/VF; only 4 turned out to be positive with 4 negatives and 1 missing. Other than that, 6 out of 12 patients' results with no previous episode of VT/VF was properly detected as negative, 5 was detected as positive while 1 as missing. However we must bear in mind that the algorithm was designed to assess the risk of SCD only if arrhythmias are present in the ECG signal. Nevertheless, one patient had a full-blown episode of VT/ VF while was on Holter monitor and the algorithm successfully detected the episode.

Conclusion

The sample number is small thus the results might not show the accurate sensitivity and specificity of the proposed ICD algorithm. The limitations in obtaining the patients results was the mobility and location of the target population as some live far away from the place that our research was conducted.

Defining Citation Classics in Breast Cancer Care

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Introduction

Citation reviews may alert clinicians to the all time great research publications in their area. Iconic landmark publications are the most cited in the literature and exert major influence in fashioning care. This study evaluated the most cited breast cancer related publications in the modern day literature.

Methods

This study was undertaken to determine the most cited breast cancer care articles published between 1980 and 2011. The Web of Knowledge Database, a product of the Institute for Scientific Information (ISI) was searched using a search term of "breast cancer care"; 30,594 articles were included in this initial data set and all results over 250 citations were tabulated .

Results

Of the 30,594 articles retrieved from the database, 150 (.004%) were cited over 250 times, with 29 of them cited over 500 times. Publication year ranged from 1981 to 2006 (median 1995). The top five appear in Table1

Rank	Author	Title (abbreviated)	Year	Citations
1	Elston	Pathological prognostic factors.	1991	2198
2	Cella	Assessment of cancer-therapy scale.	1993	1562
3	Struewing	Cancer risk associated with specific mutations	1997	1165

4	Spiegel	Effect of psychosocial treatment on patients.	1989	1154
5	Fisher	8-Year results comparing total mastectomy and lumpectomy.	1989	1081

16% of the articles examined mammographic topics, while 12% examined chemotherapeutic interventions

Conclusions

This study is one of the first to define the greatest citation classics in breast care and provides a useful resource to those caring for patients with breast disease.

Patterns of Use, Motivational Factors and Perceived Benefits Reported by Patients Attending a Herbal Medicine Clinic in Ireland

Hannah Linane (4MB3); Dr. Gerard Flaherty, Dr. Dilis Clare

Aim of study

Herbal medicine usage has risen in recent years in westernised society. This study aims to determine the pattern of usage, perceived benefits and motivating factors associated with herbal medicine treatment. It also explores levels of communication between herbal medicine practitioners and General Practitioners.

Methods and materials

Two hundred patients attending a herbal medicine clinic were invited to complete a questionnaire by post. Participants were asked about their experiences and opinions regarding their herbal medicine treatment.

Results

The response rate was 31.5% (n=63). The majority of patients were female (69.8%, n=44), attending for a chronic illness of more than 5 year duration. Some were seeking an alternative to conventional medicine (20.6%, n=7), as they perceived that herbal medicine is safer (67.7%, n=42), with fewer adverse effects and a greater emphasis on emotional and mental health. Many reported that orthodox treatment was not effective (20.6%, n=7). Some respondents believed the GP consultation was too short (32.8%). A large proportion reported an improvement in their emotional (45%, n=27) and general health (63.9%, n=39) and a reduction in symptoms (57%, n=33) following herbal medicine treatment. Approximately half informed their GP of their herbal medicine use.

Conclusion

Users of herbal medicine perceive it as a safe and viable alternative to conventional medicine. Many experienced a reduction in symptoms and an improvement in general and emotional health. Communication barriers exist between herbal medicine practitioners and GPs. Further studies into how this subject is approached in GP consultations may provide reasons for this.

Audit of the Impact of Attendance at a Specialised Paediatric Asthma Clinic as measured by MiniAQLQ and Parent Questionnaire

¹I.M. Haugh, ^{2,3}M. Herzig

The purpose of this study was to assess improvement in quality of life using the mini asthma quality of life questionnaire (miniAQLQ) and to measure general parent satisfaction with regards to the quality of care after attending a specialised paediatric asthma clinic.

Pre- and post-clinic miniAQLQs and satisfaction questionnaires were administered to all patients/parents attending the paediatric asthma clinic at the University Hospital Galway from August 2010 to August 2011.

Pre and post-clinic data was completed on 34 patients between the ages of 2 and 14. The results indicated that there were statistically significant improvements in patient quality of life following attendance (pre-clinic average miniAQLQ score 6.05; post-clinic average miniAQLQ score 6.48; difference 0.42; P value 0.04). Parents were more satisfied with the quality of care at the asthma clinic than at general paediatric clinics in terms of efficiency of the staff, clarity of the explanation of their child's medicines, devices, condition and treatment plan, waiting times, their interactions with their doctor, clinic cleanliness and clinic appearance.

We conclude that attendance at a specialist asthma clinic resulted in better quality of life for patients. Caregivers were more satisfied with the quality of care given at the asthma clinic than with that at general paediatric clinics.

Public practice regarding disposal of unused medicines in Ireland.

Jacqueline Driscoll, 4MB3

Incorrect disposal of medicines may have negative consequences for the environment and public health. Directive 2001/83/EC and Directive 2004/27/EC of the European Union instructs member states to facilitate safe disposal of medicines by the public. There is no formalised system for disposal of unused medicines in Ireland. Some pharmacies accept returns and some do not. The purpose of this study is to determine practices relating to disposal of unused medicines in Ireland and investigate the chief predictors of method of disposal chosen. A sample of 398 persons was surveyed in two locations. In one location there was a DUMP campaign (disposal of unused medicines properly) that ran periodically and in the other, there was not. Seventy four percent of persons chose an incorrect method of disposal with the most commonly used incorrect method being disposal with household waste. There was no statistically significant difference regarding disposal method chosen between the two locations. The greatest predictor of someone choosing to dispose of medicines correctly (e.g.: return to pharmacy) is recall of having received advice from a healthcare professional regarding disposal. Seventy five percent of those that disposed of unused medicine correctly recalled such advice compared with only twenty six percent of those that disposed of medicines incorrectly. These findings and EU directives signify that there is a need for a formalised system for disposal of unused medicines in Ireland and wide scale publicity of the system by all in the healthcare community.

Are family doctors compliant with international breast family history guidelines?

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Breast Centre North West Letterkenny Hospital

Introduction

Optimizing breast cancer care involves appropriate risk assessment and increasing triage accuracy in reducing the drain on resources. This study undertook an evaluation of family doctors compliance with international standards for family history referrals to breast units.

Methods

An ethically approved retrospective review of patients referred to the breast unit with a family history between January and May 2011 was undertaken to determine whether they met international guidelines for referral from primary to secondary care. NICE guidelines and Tyrer-Cuzick computerised risk modelling were used.

Results

116 referred patients, mean age 46.8 ± 12.3 years (range 19-79) were studied. None had breast cancer. 51.7% (60/116) met at least one of the NICE criteria for family history referral and 64.7% (75/116) met IBIS criteria. 80.4% (45/56) who did not meet NICE criteria, failed because they had one 1st degree relative with breast cancer who was over rather than under 40. Using IBIS criteria, 41 were found to be of low risk, 72 of moderate risk and 3 of high risk. 22.4% (26/116) didn't meet either criterion.

Conclusions

Enforcing referral criteria, particularly the age of the first degree relatives could have a significant impact on referral patterns reducing the burden on breast clinics. GP's are reasonably compliant with family history referral guidelines but areas for improvement have been identified.

Determination of the Association between Expression of the MicroRNA Processing Enzyme Dicer and Clinicopathological Features and Outcome in Breast Cancer

Kate Dinneen, 3MB3. Department of Pathology

Dicer is a cytoplasmic ribonuclease critically implicated in the biogenesis of miRNAs: small, non-coding RNAs involved in governance of gene expression and cellular processes. MiRNA dysregulation is known to be connected to carcinogenesis in a number of human cancers. In breast cancer, a global down-regulation of miRNAs is observed. We sought to determine the role of Dicer, a key component of the miRNA processing machinery, in carcinogenesis, and determine its expression pattern.

Immunohistochemical analysis was carried out on 26 breast carcinoma sections. Two different anti-Dicer primary antibodies were optimised in order to determine which produced more specific staining. The sections stained with a new rabbit anti-Dicer antibody by Clonogene were scored based on the intensity of staining of different cell types, and these results were compared to clinicopathological parameters and biomarkers collected.

No statistically significant clinicopathological correlations were made due to the inadequate size and diversity of our cohort group. Dicer expression was shown to be down-regulated in breast carcinoma as expected (3), with 46% and 54% of cells staining with mild and moderate intensity respectively.

In conclusion, we discovered that a greater size and variety in the sample population is required to derive any clinicopathological correlations of great significance. However, we successfully determined the optimal anti-Dicer antibody for use in subsequent immunohistochemical analyses of breast tissue.

A Fluorescent Reporter to Identify Mesenchymal Stem Cells Undergoing Chondrogenic Differentiation

Laura Reynolds (First Year), Aileen Ryan and Linda Howard

Department: REMEDI

Chondrocytes are cells that make up cartilage, the flexible connective tissue that cushions bones at joints. Osteoarthritis, or Degenerative Joint Disease, is a common disease that results from the degradation of cartilage in joints when chondrocytes fail to repair the matrix. Mesenchymal stem cell – derived chondrocytes are being researched as a potential therapy for OA. In order to learn more about the process of chondrogenesis it is important to identify those cells in the population which form cartilage, a task that can prove quite difficult. One strategy to do this is to use a reporter construct to express green fluorescent protein (GFP) under the control of a cartilage-specific protein promoter. Chondrogenic cells containing this reporter will fluoresce green. Because MSCs can be difficult to transfect by transient transfection, eventually the reporter construct will be delivered to cells using a viral vector.

The aim of this project was to validate a potential reporter construct which allows expression under the control of the collagen type II promoter. The reporter construct was transiently transfected into primary rat chondrocytes which were shown to express collagen type II by reverse transcription PCR. These cells fluoresced green. In order to further validate this reporter construct it will be necessary to transfect cells which do not express collagen type II to ensure that the reporter construct is cartilage-specific.

Patellar fractures: a comparison of current methods of fixation

Michelle Arakgi, BA, MSc. Richard Jenkinson, MD
3MB

Objective

To compare the results and complications of different techniques for operative stabilization of traumatic fractures of the patella.

Methods

A retrospective chart review was conducted on patellar fractures in patients who were treated between January 2001 and February 2010. A review of medical records and radiographs of 167 eligible patients and 177 eligible fractures was conducted. Proportion of fractures requiring reoperation was used as the primary outcome.

Results

Of the 177 fractures, 129 had complete follow-up data (72.9%). Patients were treated with k-wire and tension band (TB) (47 fractures), screw and TB (20 fractures), screws and mersilene tape (25 fractures), screws only (20 fractures), partial patellectomy (16 fractures), or full patellectomy (1 fracture). Overall, 56 of the fractures (43.4%) required reoperation. The group with the highest proportion of reoperations was the k-wire and TB group with 27 fractures (57.4%). Eight fractures (17.0%) required revision fixation, 21 fractures (44.7%) required hardware removal, and 3 (6.4%) fractures had deep infection requiring surgical intervention. The groups with the lowest proportion of reoperations were the full patellectomy group with no reoperations, followed by the screws and mersilene group with 28% requiring reoperation.

Conclusion

There is a large variation between methods of fixation in proportion of fractures needing reoperation. A prospective study is required to better determine which method of fixation will achieve ideal results for the patient.

The effect of aortic valve replacement on diastolic dysfunction

Maeve O Connor (4MB3) , Dr.Faisal Sharif

Aortic Valve Replacement (AVR) is the gold standard of treatment for aortic stenosis. Diastolic dysfunction is often present prior to AVR. It is linked to heart failure and is measured pre-operatively using echocardiography.

Aim & methods

To determine whether or not AVR surgery improves diastolic dysfunction. 140 patients who had AVR surgery secondary to aortic stenosis from 2007 to 2010 were selected from the cardiothoracic database. A review of each patient's electronic chart using the CIS database was carried out. This was correlated with an echocardiographic review and the lab database. Statistical analysis was carried out on this information using SPSS.

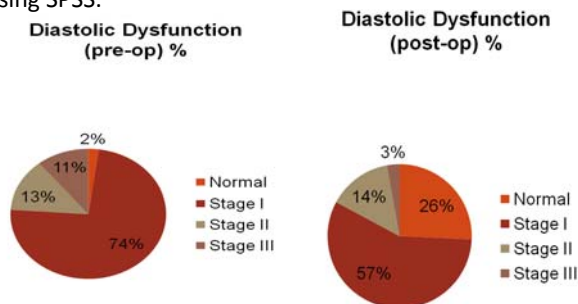


Fig.1 Trend of decreased diastolic dysfunction post Aortic Valve Replacement surgery

A trend of decreased diastolic dysfunction following AVR is noted. There are a larger percentage of patients in the normal category post-operatively (26%) than there are pre-operatively (2%). However, statistical analysis could not be performed due to the small number of patients in certain categories.

Conclusion

There is a trend towards improvement in diastolic function but there are limitations within this study. Measures of diastolic dysfunction for patients with atrial fibrillation were unable to be recorded on echocardiogram. Also there were a limited number of patients in the population group with Stage III diastolic dysfunction. For future studies it is important that pre and post-operative diastolic dysfunction be accurately measured in all patients undergoing surgery to correct valvular disease.

Rectal Aspirin in Acute Ischemic Stroke: What Dose?

Mark Gurney

Large randomized controlled trials have shown that oral aspirin (150-325mg) significantly reduces the risk of recurrent stroke and death following acute ischemic stroke when initiated within 48 hours of symptom onset. However, a large proportion of acute ischemic stroke patients have impaired swallowing and many receive aspirin rectally. It is not known whether the dose of aspirin should be same rectally and orally, and current guidelines do not recommend an optimal dose. In this systematic review, we sought to determine whether rectal administration of aspirin produced similar pharmacokinetic and pharmacodynamic profiles as orally administered aspirin in acute ischemic stroke. Such information will inform prescribing practices in a large proportion of patients with acute ischemic stroke.

Methods

The databases SCOPUS, PubMed, EMBASE, and Cochrane library were searched for articles relating to aspirin suppository use that may be relevant to acute ischemic stroke therapy. Searches were conducted for articles published from 1950- July 2011. Searches were restricted to articles published in English. The searches used combinations of the following keywords: aspirin, acetylsalicylic acid, suppository, antiplatelet, rectal, acute stroke, bioequivalence and absorption.

Results

Thirteen studies were eligible. No study included participants with acute stroke. We identified 13 clinical trials (154 participants) that compared orally and rectally administered aspirin directly in humans. One study compared ex-vivo antiplatelet effects, two compared plasma aspirin levels, eight compared plasma salicylic acid levels, and four compared urinary salicylic acid levels. Doses used ranged from 200mg to 1000mg and 11 of the 13 trials assessed equal oral and rectal doses. Six studies found no significant difference between aspirin administered by the two routes. Five showed an increased rate of absorption with oral aspirin, but comparable levels at later time-points. Two suggested a slight advantage to rectal administration over oral in terms of rate and extent of absorption.

Conclusions

No trial compared oral and rectal aspirin in patients with acute ischemic stroke. However, studies in other populations suggest that oral and rectal aspirin have comparable pharmacokinetic and pharmacodynamic profiles. Based on this review, a dose of 300mg rectally would appear optimal in patients with acute ischemic stroke.

Epidemiology of extra-intestinal cancers in inflammatory bowel disease in Ireland

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Other Authors: Professor Laurence Egan, Cara Dooley,
Dr. John Newell, Duangporn Jitjai

Background

Numerous studies have clearly established the association between inflammatory bowel disease and intestinal cancer (1-3). However, only a select number of studies have investigated the link between IBD and extra-intestinal malignancies (4-6), and their results have been contradictory. The purpose of this study was to assess whether such an association exists, by performing a statistical analysis of cancer rates in the Republic of Ireland between 2000 and 2006.

Aims and Objectives

- To investigate whether IBD patients are at an increased risk of developing certain types of extra-intestinal malignancy
- To ascertain whether any drugs commonly used in the treatment of IBD, are associated with an increased incidence of extra-intestinal cancers.

Methods and Materials

Upon obtaining ethical approval, anonymised datasets were accepted from the National Cancer Registry of Ireland (NCRI), with information pertaining to all cancer data from 1994-2006; cancer data relating to a population of patients with IBD and information relating to prescriptions received by this IBD population.

Before statistical analysis of the data could be performed, extensive re-organisation of the databases was necessary to construct it into a statistically-suitable configuration. It was transformed from a predominantly row-based format to a column-based format.

Similar cancers, and medications, were grouped together to increase statistical power. Statistical analysis is ongoing.

Day-case tonsillectomy in the west of Ireland: Patient suitability and recommendations

Natallia Kharytaniuk, 5MB

Objectives

Tonsillectomy is one of the most common ENT procedures performed worldwide. In an attempt to improve health care efficiency and due to the obvious financial benefits, it has been proposed that tonsillectomy be undertaken as a day-case procedure in Ireland. The objectives were to determine the percentage of patients suitable for day-case tonsillectomy in our institution, identify common contraindications, and the support and the infrastructure required for the provision of a safe and efficient procedure.

Methods & Results

We conducted a retrospective study looking at both medical and social criteria of all patients that underwent tonsillectomy between July 2010 and August 2011. International comparisons were made.

208 tonsillectomies were performed. 161 patients were included, 78 (48%) adults and 83 (52%) paediatric patients, 68 (42%) males, 93 (58%) females. Using distance/time criteria of 40km/30min, only 27% of patients were suitable overall, 24 (31%) adults and 19 (23%) children. The distance/time criteria excluded 49% of patients. 16% of patients were excluded for two or more reasons. The diagnosis of obstructive sleep apnoea was the most common medical reason for exclusion (6% of patients).

Conclusions

Only 27% of patients were found to be suitable for day-case tonsillectomy. Inclusion/exclusion criteria need to be debated on a national basis. However, local geographical variations must be considered. Currently, the infrastructure and the support required for a patient-focused, safe and efficient day-case tonsillectomy are deficient, and need investment and development.

A Review of Patients with Type 2 Diabetes attending the Annual Diabetes Clinic and the Nurse-led Preassessment Clinic at University Hospital Galway.

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Patients with well controlled Diabetes attending University Hospital Galway are reviewed once a year. Many of these patients attend a nurse-led pre-assessment clinic. A review of demographic and biomedical characteristics of patients attending the annual review clinic, and the impact, if any, of attendance at the nurse-led pre-assessment clinic, was proposed.

Patients who attended the annual review clinic between January and June 2009 were included in the study. Patient demographic and biomedical data was collected from the hospital clinical and laboratory information systems. Analysis was carried out using SPSS 18.0. Ethics approval was obtained from Galway University Hospitals' Ethics Committee.

Data was collected on 131 patients. Mean duration of diabetes was 6.8 years. Patients had mean systolic and diastolic blood pressures of 131 and 74 respectively. 11.5% were smokers. Mean HBA1C was 6.9, mean cholesterol, HDL and LDL were 4, 1.2 and 2 respectively. 23% of patients were on insulin. 79% were on aspirin, 92% on antihypertensives and 98% on lipid lowering medications. 16 patients had documented hypoglycaemia. Patients who attended the nurse-led pre-assessment clinic lived nearer to the diabetes centre than those who didn't attend, 25km versus 34km. This difference was significant ($p=0.03$). Mean body mass index was significantly lower in those who attended the nurse-led pre-assessment clinic (30.2 vs 32.7, $p=0.007$).

Patients attending the annual review clinic have well controlled diabetes and blood pressure, and satisfactory lipid profiles. Patients who did not attend the nurse-led pre-assessment clinic lived further away and a higher body mass index.

The Development of a New Comprehensive Hypertension Database and Pilot Hypertension Clinics at University College Hospital Galway leading to the Introduction of Renal Artery Denervation as a Treatment Option for Patients with Resistant Hypertension

Orlaith Burke

We hypothesize that comprehensive record keeping and dedicated and rapid access clinics can improve control and overall management of patients with hypertension

Methods

We developed an all-inclusive hypertension database which included patient's baseline information, hypertension diagnosis, investigations to date to exclude secondary causes, previous ambulatory blood pressure monitors, current and past medications and follow-up. The aim was then to populate this database by seeing patients in a new consultant led rapid access hypertension clinic in UCHG. The goal of this clinic was to assess patients that had been diagnosed with hypertension and evaluate their overall management. The patients for three pilot clinics were sourced from cardiology outpatients and HIPE data. The patients were initially contacted via phone and a follow up letter confirming details of their appointment was then sent to those who were willing and able to attend. The database was populated for these 60 of patients after their visit to the clinic. Out of these 60 of patients we identified 8 patients with resistant hypertension. These patients were considered for renal artery denervation (RND) which is a device based procedure for renal artery ablation to reduce sympathetic activity. After appropriate screening and consent four patients were enrolled for this procedure. On the 16th of September the first four RND were performed successfully. There were no procedural or post procedural complications. All patients were discharged after overnight stay and followed up one week post procedure.

Conclusion

The new database and dedicated hypertension clinics can significantly improve patient's management and blood pressure control through improved record keeping, active management and rapid access. Through these clinics patients were identified who were resistant to conventional drug therapy and were treated with device based treatment for hypertension.

Characterisation of Patients with Sarcoidosis presenting to Letterkenny General Hospital from January 2000 to June 2011

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Information regarding the clinical profile of sarcoidosis in Ireland is limited, despite the high prevalence of this condition. Clusters of cases in time and space have been identified. This study aims to characterise patients presenting with sarcoidosis in Donegal by determining demographics, presenting stage, organ involvement, pulmonary function and treatment.

A retrospective analysis was undertaken of medical records of patients with sarcoidosis presenting to the respiratory department at Letterkenny General Hospital (LGH) between 1st Jan. 2000 and 31st June 2011.

72 new cases presented (intriguingly, 36 of these within a consecutive 3-year period). 30(42%) female, 42(58%) male. Mean(SD) age was 44.2(12.5)years. Presenting features were as follows: 56% respiratory, 31% arthralgia, 29% erythema nodosum, 12% night sweats, 4% uveitis, 3% neurosarcoidosis, 3% hypercalcaemia. Initial chest x-ray staging was as follows: 13% -Stage 0, 51% - Stage 1, 11% - Stage 3 and 3%- stage 4. A definite histological diagnosis was made in 47(65%).

Initial treatment included: systemic steroids 27(38%), inhaled steroids 10(13%) and non-steroidal anti-inflammatories 2(3%). 33(46%) of patients received no pharmacological therapy after initial assessment.

In summary, patients had a wide variety of presenting features, investigations and treatment. We appear to have had a cluster of cases between 2007-2009.

The use of ^{13}C glucose breath test in the diagnosis of diabetes mellitus

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The current gold standard of diagnostic method for diabetes is the oral glucose tolerance test (OGTT). However this method is invasive and is not very reproducible. HbA1c and fasting plasma glucose levels are also used but these methods cannot diagnose impaired glucose tolerance. The ^{13}C glucose breath test is a novel non-invasive method of diagnosing diabetes. It does not require any phlebotomy and is safe for use in children and pregnant women. The specificity and sensitivity of this test is also not known.

Objectives

To review the published literature and compare the published correlation of ^{13}C glucose breath test with other methods of diagnosing diabetes and to test its reliability.

Methods

We searched Medline, Pubmed, Google Scholar, WIPO Patentscope and clinicaltrials.gov for relevant papers, patents and clinical trials. We used the search terms ^{13}C CO₂, ^{13}C glucose, breath test and diabetes. We also looked through all the papers referenced by the papers we found through the search engines. We also looked through all the papers written by the authors of the relevant papers.

Results

We included 7 published papers, 1 abstract and 1 patent application. The trials had been performed on obese prepubertal children, pregnant women, lean type 2 diabetics, obese type 2 diabetics, obese subjects with normal glucose tolerance, pre-diabetic participants, rural Indian Asians, urban Asian Indians and lean control subjects. Five studies showed that the ^{13}C breath test correlated well with indexes derived from the OGTT. However one study showed that the ^{13}C breath test did not correlate with the OGTT when performed on rural Asian Indians. One study showed that the ^{13}C breath test correlated well with the hyperinsulinemic euglycemic clamp. Another papers showed that there is very low intra-individual variability in results from the ^{13}C breath test. A patent application tested sensitivity (73%), specificity (92%), positive predictive value (90%) and negative predictive value (77%). However one study showed that the ^{13}C breath test did not correlate with the OGTT when performed on rural Asian Indians.

Conclusions

The ^{13}C glucose breath test correlates well with the hyperinsulinemic euglycemic clamp. But the OGTT correlates even better with the hyperinsulinemic euglycemic clamp. The ^{13}C breath test also correlates well with the OGTT. However this should not be used to measure the ^{13}C breath test's diagnostic value as the OGTT method has many flaws. The ^{13}C breath test also has very good reproducibility.

Fibrinogen as Serologic Predictor of Stroke and Death after Carotid Endarterectomy – a Retrospective Study.

Syed Naqvi

Introduction

Clinical and experimental research suggests that systemic atherosclerosis is a disorder characterized by inflammation. [1]. Carotid artery stenosis is a common finding in systemic atherosclerosis. For those with significant stenosis of the carotid artery, the currently accepted standard of treatment is Carotid Endarterectomy (CEA). In patients undergoing CEA, it is suggested that elevated fibrinogen, a biomarker of inflammation, may contribute to the prediction of neurologic adverse events such as stroke along with other established risk factors for vascular events (e.g. hypercholesterolemia, old age and diabetes mellitus).

A number of large and prospective epidemiologic studies have indicated that elevated fibrinogen is an important predictor of future coronary events in individuals with a history of coronary heart disease [2]. Many studies have also shown that raised levels of fibrinogen, increase the risk of ischemic or hemorrhagic stroke. [3] Wilhelmssen et al carried out a study to explore the possible risk factors for cardiovascular disease and came to the conclusion that fibrinogen levels play an important part in the development of stroke and myocardial infarction (MI). [4] In addition, an analysis of the EUROSTROKE project indicated that 'fibrinogen is a powerful predictor of stroke' including fatal and nonfatal strokes, first time strokes, and hemorrhagic and ischemic strokes. [5]

It is established that raised levels of fibrinogen increase the risk of coronary heart disease. Studies on the association between this inflammatory marker and stroke/mortality after CEA are limited, however. The aim of this study is to assess whether elevated fibrinogen is a useful predictor of stroke and death in patients with carotid artery stenosis after CEA. The measurement of fibrinogen at baseline may help identify those who are at an increased risk of adverse ischemic events. Elevated fibrinogen may be associated with a less favourable prognosis in patients with carotid stenosis who undergo CEA. Patients may benefit from a treatment strategy aimed at attenuating the systemic inflammation.

Materials and Methods

This study was performed according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines [6].

Design

This is a retrospective cohort study designed to evaluate the potential association between fibrinogen levels and neurologic adverse events and mortality after Carotid Endarterectomy and to compare the strength of this association with traditionally established demographic and historical risk factors such as age, gender, smoking and hypercholesterolemia.

Patient population

The patient population includes patients with high-degree carotid artery stenosis who underwent Carotid Endarterectomy (CEA). The degree of stenosis was evaluated by duplex ultrasound imaging following the Strandness criteria. [7] Carotid duplex ultrasound imaging was performed on all patients by registered vascular technologists in a certified vascular laboratory. The study includes male and female patients 40 years or older who were referred between August 2002 and September 2009 for possible/known, unilateral/bilateral, symptomatic (>50% ICA stenosis)/asymptomatic (>60% ICA stenosis) carotid artery stenosis. [8, 9] All CEA were performed by an experienced vascular surgeon in Galway University Hospital (GUH).

All patients underwent neurologic examination within 2 days before and after the procedure.

Clinical history and physical examination were taken with special attention to cerebrovascular risk factors. The following risk factors were recorded using history or direct measurements: diabetes mellitus (HbA1c >6.5%, fasting blood glucose >120 mg/dL, or presence of antidiabetic drugs), hypercholesterolemia (fasting serum cholesterol levels >220 mg/dL or presence of lipid-lowering drugs), smoking (current or within the previous year), previous transient ischemic attacks (TIAs) and strokes, coronary artery disease (angina, MI, percutaneous transluminal angioplasty, or surgery), and the presence of contra-lateral carotid disease (assessed with sonography). All patients routinely received a sonography at the follow-up visits after CEA to document patency.

Fibrinogen measurement

Blood samples for measurement of fibrinogen were taken from an antecubital vein and were analyzed. Plasma fibrinogen activity was measured quantitatively population for this analysis. The remaining 133 patients

by the Clauss method (Dade Behring, Schwalbach, Germany).

Clinical outcome measures

The clinical outcome measures are minor/major stroke or death within 30 days and were defined as follows: Minor Stroke - Any new neurologic deficit (either ocular or cerebral) that persisted for more than 24 hours and that either resolved completely within 30 days or increased the National Institutes of Health stroke scale score by <3 points; Major Stroke - Any new neurologic deficit that persisted after 30 days or increased the National Institutes of Health stroke scale score by >3 points.

Statistical analysis

Data were analyzed using Minitab 16. Continuous data were compared using independent *t* tests. Values of continuous variables are expressed as mean ± standard deviation. Categorical proportions were compared using χ^2 analysis or the Fisher exact test. The Fisher exact test was used when the predicted contingency table cell values were less than 5.

To investigate the independent relationship between binary outcome and measured covariates, the logistic regression model was used. Calculations of odds ratios with 95% confidence intervals (CI) were performed using the standard equations. Logistic regression analysis was used to examine the independent associations of fibrinogen level against various traditional vascular risk (TVR) factors, with the binary categorical outcome measure being any stroke or death after carotid endarterectomy. Regression equations took the following form: outcome variable = $b_0 + b_1(\text{TVRa}) + b_2(\text{TVRb}) + b_3(\text{TVRc}) + b_n(\text{TVRi})$ (where *b* indicates the regression coefficient representing the amount the dependent variable changes when a corresponding independent variable changes 1 U, and the subscript indicates that coefficient corresponds to that specific variable). The TVR factors studied included age, gender, smoking history, diabetes mellitus, coronary artery disease (CAD) and hypercholesterolemia.

All tests were considered significant at $P \leq .05$.

Results

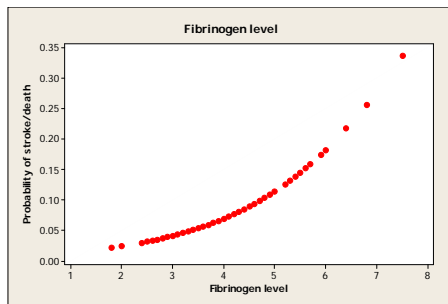
From Aug 2002 to Sep 2009, a total of 304 consecutive patients with symptomatic or asymptomatic carotid stenosis had been treated with CEA. Of these patients, preprocedural fibrinogen values had been obtained in 171 patients (116 men and 55 women; mean age of 68; age range from 40 to 84) who comprised the study

were excluded since they did not have fibrinogen values. With respect to the age and gender, there is no significant difference between the population of patients with available fibrinogen values and those without (Table 1). However, there is a greater percentage of smoking patients, patients with hypercholesterolemia and those with coronary artery disease in the group with no fibrinogen values.

119 patients had elevated fibrinogen values before CEA. The demographic and clinical characteristics of patients with normal preprocedural fibrinogen values and those with elevated fibrinogen values before CEA were similar; however, there was a significantly greater percentage of patients with contralateral stenosis in the group with normal preprocedural fibrinogen levels as compared to the elevated fibrinogen group (CI, 0.06 to 0.37; $P < 0.005$). Cigarette smoking was the most frequent vascular risk factor in the elevated fibrinogen group, followed by hypercholesterolemia, coronary artery disease, and diabetes mellitus. In patients with normal levels of fibrinogen, cigarette smoking and hypercholesterolemia were equally frequent followed by coronary artery disease and diabetes mellitus. CEA was successful in all patients; patency of the artery was documented with a sonography follow-up study in each patient.

Table 3 summarizes the postprocedural complication rates. For the entire study population, the minor stroke rate was 3 of 171 (1.8%), the major stroke rate was 2 of 171 (1.2%), and the death rate was 2 of 171 (1.2%). All strokes were ipsilateral to the treated artery. The incidence of stroke and death within 30 days was significantly different ($P < 0.05$) between patients with elevated preprocedural fibrinogen values and those with normal fibrinogen values (Table 3).

In a multivariate logistic regression model, after adjusting for all the predictors, baseline fibrinogen (OR, 2.67; CI, 1.01 - 7.02; $P < 0.05$) appears to be a significant independent predictor of stroke and death after CEA. The odds of stroke or death significantly increase with increasing fibrinogen level (Figure 1).



Discussion

In this study, we analyzed the association between baseline fibrinogen levels and stroke and mortality after CEA. Our results demonstrate that fibrinogen is a predictor of future ischemic strokes in people with symptomatic and asymptomatic carotid artery stenosis. Elevated preprocedural fibrinogen levels are associated with an increased risk of stroke and death after CEA in these patients.

The results from this study are supported with observations from other prospective studies which suggest that fibrinogen evaluation may be useful in identifying patients at higher risk of atherosclerosis associated events [10]. As mentioned earlier, the analysis of the EUROSTROKE project indicates that increased 'fibrinogen is a powerful predictor of stroke'. Dividing the population into four groups (quartiles) based on their fibrinogen levels, researchers estimated that the risk of stroke increased by nearly 50% for each ascending quartile. Individuals whose fibrinogen levels were in the highest quartile were almost seven times more likely to suffer a hemorrhagic stroke, and more than twice as likely to die from a stroke. [5] Kofoed et al's study suggests a doubling in risk of ischaemic stroke for high versus low fibrinogen [3]. In the Framingham Heart Study (1315 men and women; 12 years follow-up; 92 strokes), relative risk in the highest versus lowest tertile of fibrinogen was 1.9 for men and 2.0 for women, though neither was significant. [11] In the Cardiovascular Health Study (5888 men and women; 5 years follow-up; 473 strokes/transient ischaemic attack) relative risk of stroke or transient ischaemic attack in the highest versus the lowest quintile of fibrinogen was 1.8. [12] Chuang et al discovered that in addition to hypertension and diabetes, fibrinogen independently predicted future ischemic stroke risk. [13] They suggest that 'fibrinogen should be considered in the risk assessment model for ischemic stroke'. Fibrinogen's association with increased mortality is probably directly related to its ability to promote thromboses, or clots, by causing platelets to clump inside blood vessels. This is one of the main

mechanisms underlying ischemia and heart attack.

Exercise, quitting smoking, and certain medications have been shown to lower fibrinogen in the short term. However, no drug (with the possible exception of estrogen) or lifestyle change is known to significantly alter fibrinogen levels, although quitting smoking does result in slight reductions in fibrinogen levels. Nutritional supplements can reduce fibrinogen levels and the inherent risk of hyper-fibrinogenemia-related diseases. Ramirez-Bosca's studies in Spain have demonstrated that certain antioxidants are capable of dramatically reducing blood levels of lipid peroxides and oxidized lipoproteins after only 15 days [14, 15] with no adverse effects noted by any of the subjects or adverse changes in any other blood chemistries.

This study has several limitations. First, although a standard operation procedure is followed when calibrating the ultrasound units before each scan, a limitation could be variance between the vascular technologists. Nevertheless, objective grey-scale median values generated by a computer were used instead of visual subjective classification which overcomes this variance. Second, given its retrospective study design, it is subject to several possible biases, namely reporting bias and selection bias. It is possible that presenting symptoms, risk factors and fibrinogen levels were under-reported; we had to rely on the record keeping of the clinicians. In the present study, there is almost 44% missing fibrinogen values, this may have lead to selection bias. However, there were no significant differences between the population of patients with available fibrinogen values and those without. Thus, the selection bias was unlikely to be large. Third, we did not measure other markers of inflammation, such as C-reactive protein, which may increase with fibrinogen as predictors of arteriosclerosis. Fourth, plasma fibrinogen concentrations were not repeatedly measured after baseline. The single baseline measurement may lead to regression dilution bias and underestimate the strength of associations. [16]

Despite these limitations, the message from this study is clear; elevated fibrinogen predicts future ischemic strokes. This study further contributes to current research given that it highlights the key issue of patient selection; clinicians may improve the efficacy and safety of CEA by identifying patients who may suffer post-operative stroke.

To completely appreciate the importance of such findings, future researchers may consider exploring the following areas: plaque morphology and its relationship to fibrinogen levels, symptoms and outcome; the relationship between smoking and elevated fibrinogen assessing asymptomatic and symptomatic patients separately; C-Reactive Protein and ESR (erythrocyte sedimentation rate) levels to further understand the idea that systemic atherosclerosis is a disorder characterized by inflammation; consider whether medication (anti-platelet, anti-coagulant, anti-hypertensive agent, statin) affects outcome or whether therapy correlates with fibrinogen level?

In conclusion, fibrinogen may contribute to better risk assessment in patients with carotid artery stenosis in combination with established methods.

Treatment Outcome in External beam Radiotherapy of the Prostate

Paul (Joon Koo) Choi and Dr. Van Der Putten

External radiotherapy of the prostate is an effective treatment modality for prostate cancer. Treatment techniques have changed considerably, from a traditional four field (Left and Right Lat, PA and AP beams) "box" technique to conformal treatments using up to six beams. Subsequent to this Intensity Modulated Radiation Therapy (IMRT) has been introduced. These progressive changes in treatment aim to improve the dose to the tumour and reduce damage to normal tissue. IMRT treatments have a number of disadvantages, being extremely labour intensive and also producing an increased radiation dose to the patient outside the treatment area. These disadvantages of IMRT could be outweighed by potential benefits such as reduced morbidity and ultimately better outcome. University Hospital Galway has to date not yet performed a detailed analysis of the outcome of its radiotherapy treatments. The hospital is unique in that it has a fully electronic patient database. Although a considerable amount of data is recorded in the database this has not yet been extracted in a systematic way. The aims of the project proposed here are to 1) perform a literature search on the optimal parameters to be recorded to measure treatment outcome in prostate radiotherapy 2) systematically extract treatment outcome data from the database 3) compare different treatment techniques (conformal, IMRT) for different outcome. The overall goal for the project is to have a detailed form to record treatment outcomes for prostate radiotherapy.