

Abstracts

79th Meeting of the Ulster Society of Internal Medicine, Friday 16 May 2008

Postgraduate Centre, Antrim Area Hospital



PROGRAMME

- 1.55pm - Welcome: Chairman: Dr David Higginson
- 2.00pm - Presented Abstracts
- 3.00pm - Invited Abstract: 'Update on Epilepsy'
Dr John Craig, Royal Victoria Hospital.
- 3.30pm - Afternoon Tea
- 3.50pm - Business meeting
- 4.20pm - Invited case from Antrim Area Hospital
- 4.30pm - Presented Abstract
- 4.45pm - Presentation of prize for best abstract
- 5.15pm - Guest lecture: 'Percutaneous Aortic Valve replacement'
Dr Ganesh Manoharan, Royal Victoria Hospital.

PRESENTED ABSTRACTS

1. A comparison of the 12 lead ECG and the body surface map with verification by early rest myocardial perfusion imaging in the diagnosis of acute posterior myocardial infarction.

J Neill¹, J Shannon¹, A Hamilton¹, P Scott¹, M Harbinson², AAJ Adgey¹

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Posterior myocardial infarction (MI) is difficult to diagnose by ECG. Patients with posterior MI benefit from early revascularisation. The 80 lead body surface map (BSM) samples more of the chest wall inclusive of the posterior thorax than the ECG. Myocardial perfusion imaging (MPI) is sensitive in identifying presence and territory of MI. We aimed to compare initial ECG and BSM with results of early MPI.

All patients presenting with ischaemic type chest pain at rest >20mins to our CCU between Oct 2004 - Oct 2006 had an initial ECG and BSM recorded. Those with either ST depression >0.1mV in leads I, aVL or V1-V6 on ECG or posterior STE >0.05mV on BSM were recruited. ECGs and BSMs were independently interpreted. All patients had rest MPI <24 hours from chest pain. Scans were coded (blinded to

ECG and BSM) using a 17 segment polar plot and posterior wall perfusion defects (PWP) were recorded. MI was diagnosed when 12 hour cTroponin T was >0.09ng/ml.

Seventy-two patients were recruited. Thirty patients had STE on ECG (42%, 30/72). Predominant STE on BSM identified 7 inferior (10%, 7/72), 41 posterior (57% 41/72) and 10 right ventricular MIs (14%, 10/72). Fourteen had no STE on BSM (19%, 14/72). Sixty-eight (94%, 68/72) had cTroponin T >0.09ng/ml. The BSM was 81% sensitive (55/68) (95%CI 70-89%) for identification of MI compared with 44% (30/68) (95%CI 32-57%) sensitivity for the ECG (McNemar's p<0.001).

Sixty-nine patients had interpretable scans: 60 (87%, 60/69) had PWP. Initial ECG showed STE inferiorly in 21 (35%, 21/60); 39 were non-diagnostic (65%, 39/60). Predominant STE on BSM identified STE inferiorly in 7 (12%, 7/60), posteriorly in 32 (53%, 32/60), and 9 had right ventricular STE (15%, 9/60). Twelve had no STE (20%, 12/60). The ECG did not identify any posterior MI. Of patients with PWP and non-diagnostic ECG, 51% (20/39) were posterior MI by the BSM. Sensitivity of BSM for PWP was 53% (32/60) (95%CI 40-66%).

Sixty-five percent (39/60) of patients with PWP had non-diagnostic ECG. The BSM identified more (53%, 32/60) of these patients than the ECG (0/60) and thus indicates patients who would benefit from early reperfusion.

2. Development of colonoscopy skills using a virtual reality simulator

V Armstrong, C Gallagher, W Dickey. Department of Gastroenterology, Altnagelvin Hospital, Londonderry, UK.

The impending introduction of colorectal cancer screening in Northern Ireland will increase the need for appropriately trained colonoscopists. Practice using virtual reality endoscopy simulators improves and accelerates the technical competence of trainees in the early stages of patient-based practice^{1,2}. We assessed the usefulness of a computer-based colonoscopy simulator as a potential pre-patient training tool by studying the learning curves of two medical students with no previous hands-on colonoscopy experience. After a brief demonstration of colonoscopy principles and scope handling, the students completed fifteen unsupervised repetitions of each of three colonoscopy modules of increasing difficulty using the Simbionix GI Mentor II simulator (Simbionix

Ltd, Cleveland, USA) which provides recorded feedback of performance. Skill was assessed on four criteria: caecal intubation time, percentage of mucosal surface examined, efficiency of screening and frequency of excess pressure. Student results were compared with each other as well as with results from a panel of trained colonoscopists. Performances of both students were similar and improvement peaked after approximately ten repetitions of each module. These peak values were comparable with the results achieved by the trained endoscopists. In conclusion, colonoscopy simulators offer an alternative to early patient-based practice, allowing initial training to take place in a stress free environment without the disadvantages of patient discomfort or the need for supervision. Novices can rapidly develop and improve the relevant practical skills. However, the early plateau in performance suggests that progression to patients and active supervision should follow rapidly.

1. Sedlack RE, Kolars JC. Validation of a computer-based colonoscopy simulator. *Gastrointest Endosc* 2003;**57**(2):214-8.
2. Park J, MacRae H, Musselman LJ, *et al.* Randomized controlled trial of virtual reality simulator training: transfer to live patients. *Am J Surg* 2007;**194**(2):205-11.

3. Tertiary referral centre experience of pericardiocenteses performed over a 3-year period: Diagnosis, Complications and outcomes.

SL Fairley, JR Bennett, GWN Dalzell. The Belfast Heart Centre, Royal Hospitals, Belfast HSC Trust, Belfast, UK.

All pericardial aspirations performed over a 3-year period were identified by the Scope Database. Patient demographics / characteristics, procedural complication rates, underlying diagnoses and short and long-term outcomes were evaluated.

In total, 42 pericardial aspirations were performed on 39 patients. The mean patient age was 59 years. Clinical and / or echocardiographic evidence of cardiac tamponade was present in 25 cases (40%). In 7 patients (17%) the presence of a pericardial effusion was detected as an incidental finding on imaging. Known malignancy was evident in 5 patients (12%) at presentation (4 cases of primary lung tumour, 1 case of lymphoma).

Forty procedures were performed under fluoroscopic guidance and 2 procedures were performed blind. Additional echocardiography guidance was used in 24 cases (60%), needle-tip ECG monitoring in 3 (7%), and right heart catheterisation also in 3 cases (7%). Aspiration was successful in 41 cases, with only 1 minor complication occurring.

Underlying aetiologies were as follows (see Table I): 10 post-cardiac surgery (24%), 8 malignant effusions (19%), 7 post-coronary intervention / pacemaker insertion (16.6%), 2 due to over-anticoagulation (4.8%), and 1 secondary to viral pericarditis (2.2%). The remaining 8 cases were secondary to autoimmune disorders, HIV cardiomyopathy, and trauma (19%). Six cases were classified as idiopathic (14.3%). Short and long-term outcome was excellent for post-operative effusions. Conversely, six-month survival for malignant effusions was 12%.

The current practice is encouraging with low complication

rates. There is scope for improvement by integrating invasive haemodynamic monitoring via right heart catheterisation as guidelines suggest¹.

1. Maisch B, Seferovic PM, Ristic AD, Erbel R, Rienmuller R, Adler Y, Tomkowski WZ, Thiene G, Yacoub MH. Guidelines on the diagnosis and management of pericardial diseases. The Task Force on the diagnosis and management of pericardial diseases of the European Society of Cardiology. *European Heart Journal* 2004;**25**(7):587-610.

TABLE I:

Underlying aetiologies of pericardial effusions

| Aetiology | Number (%) |
|--------------------------------------------------|------------|
| Post-cardiac surgery (CABG / Valve surgery) | 10 (24%) |
| Malignancy | 8 (19%) |
| Post-coronary intervention / pacemaker insertion | 7 (16.6%) |
| Idiopathic | 6 (14.3%) |
| Over-anticoagulation | 2 (4.8%) |
| Secondary to viral pericarditis | 1 (2.3%) |
| Other (autoimmune / HIV / trauma) | 8 (19%) |

4. Effects on Weight Loss, Body Composition and Insulin Resistance of Low-Fat and Low-Carbohydrate Weight Reduction Diets: A Randomised Controlled Trial.

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Low-fat weight reduction diets reduce insulin resistance and have been proven to prevent type 2 diabetes in those at risk. A number of alternative diets focusing on carbohydrate restriction have been advocated but reciprocal increases in dietary fat may have detrimental effects on insulin resistance.

We performed a randomised controlled trial to compare a low-fat (20% fat, 60% carbohydrate) versus a low-carbohydrate (60% fat, 20% carbohydrate) weight reduction diet in 24 overweight/obese non-diabetic subjects, BMI 33.6±0.8 kg/m² age 39±2 years (mean ± SEM). Assessments were performed before and after an 8-week dietary period. Body composition was measured by DEXA and insulin resistance by the hyperinsulinaemic euglycaemic clamp technique. Within- and between-group comparisons were analysed by paired - and independent - samples t-tests, respectively.

Significant weight loss ($p < 0.05$) occurred within both the low carbohydrate and low fat groups, however there was no difference between the groups (7.4±1.0 kg vs. 6.4±0.5 kg, respectively, $p = 0.4$). Percentage body fat also reduced significantly within both diet groups ($p < 0.05$) but by a comparable degree (1.5±0.7 vs. 1.8±0.4% $p = 0.75$). Both diets resulted in similar reductions in waist circumference. Although the glucose infusion rates (GIR) increased with

weight loss on both diets there was no difference between groups (4.8 ± 1.7 vs. 1.8 ± 2.0 $\mu\text{mol/kg/min}$ $p = 0.28$).

This study demonstrates comparable effects on insulin resistance of two weight loss diets independent of macronutrient content. The effects of weight loss associated with a low-carbohydrate diet appear to outweigh the adverse effects of increased dietary fat content with respect to insulin sensitivity.

5. Primary Amyloidosis Presenting with Syncope, Recurrent Chest Pain, Progressive Cardiac Failure and Recurrent Ventricular Fibrillation.

V Kodoth¹, TG Trouton¹, P Burnside², Departments of Cardiology¹ and Haematology², Northern Health and Social Care Trust, Antrim, UK.

We report a case of a 69 year old man admitted with ventricular fibrillation (VF) cardiac arrest, recurrent chest pain and recent history of syncope. Recent coronary angiography had revealed only minor coronary atherosclerosis. Post resuscitation echocardiography showed moderate mitral and tricuspid regurgitation, concentric left ventricular hypertrophy, moderately impaired systolic function and a hyper echoic septum. 24-hour urine protein was raised at 0.40gms. Further investigations showed raised urinary free Lambda light chains of 1030mg/L (5.7-26.3mg/L) and a ratio of Kappa to Lambda light chain of 0.02 (NR, 0.26-1.65). Rectal biopsy revealed characteristic amyloid deposit. Bone marrow biopsy showed plasma cell lymphoproliferative features. Cardiac MRI showed marked thickening of the ventricles with associated valve thickening and atrial dilatation in keeping with cardiac amyloidosis. DNA analysis of whole blood and colonic biopsies did not reveal mutations known to cause hereditary transthyretin systemic amyloidosis. There was a protracted clinical course with recurrent ventricular fibrillation and progressive cardiac failure despite aggressive medical treatment. In spite of initiation of chemotherapy he eventually succumbed to resistant ventricular fibrillation.

Primary Amyloidosis is a rare disease caused by deposition of immunological light chains (AL) in various tissues due to abnormal plasma cell activity. Cardiac involvement in primary amyloidosis presents with progressive cardiac failure, arrhythmia, and hypotension and is associated with poor prognosis. This patient had an unusual presentation with recurrent syncope. Patients with unexplained cardiac symptoms, proteinuria and a hyper echoic ventricular septum

on echocardiography should be investigated with rectal biopsy and cardiac MRI to rule out cardiac amyloidosis.

6. A Comparison of Scoring Methods of Acute Myocardial Perfusion Images in Acute Coronary Syndrome Patients

J Neill¹, M Harbinson², AAJ Adgey¹. ¹Royal Victoria Hospital, Belfast, UK, ²Queens University Belfast, Belfast, UK.

Gated myocardial perfusion imaging (MPI) is used increasingly in the emergency setting for patients with acute coronary syndromes (ACS) and non-diagnostic ECGs. Validated automated scoring systems of perfusion defects e.g. the hypoperfusion index (HI) analyse severity and extent of perfusion defects (PD) but do not assess motion or thickening abnormalities. ACS patients can have wall motion or thickening defects on gated images without significant PD. We aimed to compare 3 scoring methods to the HI and also assess interobserver variability. All medium to high risk patients > 45 years presenting with ischaemic type chest pain at rest >20mins and non-diagnostic ECG to our CCU (October 2004 -October 2006) had a rest MPI <24 hours from chest pain. A 17 segment polar plot was coded independently by 2 clinicians for perfusion (0 normal - 4 absent), motion (2 normal - 0 akinesis) and thickening (2 normal - 0 absent). The summed scores were compared to the HI and interobserver variability was assessed. Gated images were available for 68 patients. The summed perfusion score (SPS) had the highest correlation with the HI (Spearman's $\rho=0.89$, $p<0.001$). The summed motion scores (SMS) ($\rho=0.61$, $p<0.001$) and summed thickening scores (STS) ($\rho=0.67$, $p<0.001$) also showed significant correlation. Agreement between 2 independently coding observers was good for both perfusion (Cohens weighted $\kappa=0.77$, 95%CI 0.57-0.94) and thickening ($\kappa=0.74$, 95%CI 0.64-0.88). Agreement was less convincing for motion ($\kappa=0.65$, 95%CI 0.52-0.79). Whilst the HI gives good measure of perfusion in ACS patients it does not assess wall motion or thickening defects which may persist despite return of perfusion. We have demonstrated that SPS correlates highly with HI and has good interobserver agreement. Of the 2 scores addressing motion and thickening, both SMS and STS correlated with the HI. Interobserver agreement was better for the STS. The STS adds additional information to an automated HI when assessing ACS patients.