

ABSTRACTS OF SOCIETIES

Scottish Cardiac Society October 2007

Renal Function and All Cause Mortality in Two Cohorts of the Glasgow Population

CA Murphy, RIS Good, RAP Weir, SD Robb, T McDonagh, HJ Dargie

Western Infirmary, Glasgow

The potential of using renal function as a prognostic tool in both the general population and in patients with established cardiovascular disease is coming under increased scrutiny. We report our findings on two epidemiological studies from Glasgow, Scotland. **Method:** In 1995, individuals from the general population aged over 55 yrs (ELDERLY cohort) and individuals with previous myocardial infarction (POST-MI cohort) were invited to attend the Western Infirmary to undergo screening; this included blood sampling, medical history and echocardiography. A second round of screening was subsequently performed in 1998.

For both cohorts, all deaths up to 31/12/2006 were collated from the General Register Office for Scotland. **Results:** ELDERLY Renal data were only available for the second screening of the ELDERLY cohort from 1998. For this cohort (n = 557), the mean (SD) age was 65.2 (5.4) years. Two hundred and eighty two (50.6%) were male, and 24 (4.2%) had left ventricular systolic dysfunction (LVSD). By the end of 2006, 90 (16.1%) individuals had died.

On univariate analysis, age, male gender, LVSD, previous MI, hypertension and an eGFR <50ml/min were all associated with increased mortality. Using Cox multivariate regression, an eGFR < 50ml/min was independently predictive of all cause mortality (ACM) [Hazard ratio (HR) 2.422, 95% CI 1.087 – 5.396, p = 0.031].

POST-MI renal data were available for the 1995 screening (n = 925). The mean age was 61.3 (7.3) years, 678 (73.3%) were male and 146 (15.8%) had LVSD. The mean (SD) time from MI to original screening visit was 7.0 yrs (range 2.5- 11.5). 281 (30.3%) had died by the end of 2006.

eGFR and renal impairment (eGFR <60ml/min) were both univariate predictors of ACM. Following multivariate analysis, eGFR was no longer an independent marker of ACM, nor did renal impairment predict death. LogBNP was an independent predictor of ACM [HR 2.061, 95% CI 1.550 – 2.741, p < 0.001] with a BNP of greater than 100pg/ml being strongly predictive of death [HR 1.827, 95% CI 1.376 – 2.427, p < 0.001].

Five hundred individuals re-attended for rescreening in 1998. Three hundred and seventy four (74.8%) were male, 68 (13.6%) had LVSD and the mean (SD) age was 61.9 (7.3) years. By the end of 2006, 110 (22%) of these individuals had died.

Three hundred and one (60.2%) individuals showed a fall in eGFR between the screening visits, with 166 (33.2%) exhibiting a fall of >5ml/min. Change in eGFR correlated negatively with baseline eGFR (r = -0.307, p < 0.001). Three hundred and forty eight (69.9%) individuals demonstrated a rise in BNP over time, with 58 (11.6%) having a rise >75pg/ml. There was no correlation between change in BNP and change in eGFR over time (r = -0.022, p = 0.617).

On multivariate analysis, logBNP at baseline was independently predictive of ACM, but eGFR or renal impairment (eGFR <60ml/min) was not. However, a fall in eGFR >5ml/min was independently predictive of ACM (HR 1.605, 95% CI 1.070 – 2.408, p = 0.022); change in BNP, or a rise >75pg/ml, was not. **Conclusion:** We found renal impairment to be an independent predictor of ACM in the elderly general population but not so in a cohort with prior MI. However, deteriorating renal function is strong independent predictor of ACM in this latter group.

“Off Label” and Untested Indications for Drug-Eluting Stents

D Austin¹, R Slack², H Eteiba³, AD Flapan⁴, KP Jennings⁵, RJ Northcote⁶, ACH Pell⁷, IR Starkey⁸, KG Oldroyd⁹, JP Pell¹⁰

¹Clinical Research Fellow in Cardiology, BHF Cardiovascular Research Centre, University of Glasgow, UK

²Scottish Cardiac Registers Co-ordinator, BHF Cardiovascular Research Centre, University of Glasgow, UK

³Consultant Cardiologist, Glasgow Royal Infirmary, Glasgow, UK

⁴Consultant Cardiologist, Edinburgh Royal Infirmary, Edinburgh, UK

⁵Consultant Cardiologist, Aberdeen Royal Infirmary, Aberdeen, UK

⁶Consultant Cardiologist, Victoria Infirmary, Glasgow, UK

⁷Consultant Cardiologist, Monklands Hospital, Airdrie, Lanarkshire, UK

⁸Consultant Cardiologist, Western General Hospital, Edinburgh, UK

⁹Consultant Cardiologist and Honorary Senior Lecturer, Western Infirmary, Glasgow, UK

¹⁰Professor of Cardiovascular Epidemiology, BHF Cardiovascular Research Centre, University of Glasgow, UK

Randomised controlled trials (RCTs) have demonstrated that among patients undergoing single lesion PCI for stable or unstable angina, DES reduce restenosis up to at least four years follow-up, with no adverse effect on death or MI. Yet observational studies of unselected groups have reported poorer outcomes following DES, and an association with late stent thrombosis. This may reflect DES being used in clinical practice for patients excluded from RCTs. A recent study demonstrated poorer outcomes for “off-label” DES use compared to “on-label” use. We used the Scottish Coronary Revascularisation Register to analyse time trends and geographical variations in “on”- and “off label” use. We also used linkage to routine data to analyse the effect on outcomes. Among the 6,374 lesions treated with a DES between January 2003 and June 2006, 76% had “off-label”/untested indications. In a multivariate Cox proportional hazards model of patients with off-label indications, DES use was associated with a higher risk of MI (HR 1.38, 95% CI 1.01-1.78, P=0.012) when compared with BMS. Diabetes, bifurcation lesions, left ventricular dysfunction, renal impairment, bypass graft stenting and acute coronary syndromes have all been implicated as predictors of stent thrombosis. Many of these sub-groups were excluded from RCTs which may explain the poorer outcomes. DES use in Scotland has reduced by approximately 20% since September 2006, reflecting an era of judicious patient selection.

The Clinical Implications of implementing National Institute for Clinical Excellence Guidelines on Primary Prevention Implantable Cardioverter Defibrillators

BP Murphy, JB Byrne, AP Davie, DL Murdoch.

Southern General Hospital, Glasgow

Introduction: In January 2006 the National Institute for Clinical Excellence (NICE) published revised guidelines for primary prevention implantable cardioverter defibrillators (ICDs) incorporating the MADIT II entry criteria. The MADIT II trial demonstrated a 5.6% absolute mortality reduction (p=0.016) over four years with the use of ICDs in patients with a prior myocardial infarction and left ventricular ejection fraction <30%, without the need for electrophysiological testing. To better target high risk patients, these guidelines incorporated a subgroup analysis from MADIT II which suggested that benefit was greatest if QRS duration was more than 120ms. In order to determine the clinical and cost impact of implementing these guidelines, we assessed clinical, ECG and echocardiographic data on all patients admitted to our hospital (catchment area 200,000) with an acute myocardial infarction over a one year period. **Methods:** All patients admitted between January 1 and December 31 2005 with a diagnosis of acute myocardial infarction were identified from our cardiac rehabilitation database. The electrocardiograms of these patients were reviewed on our ECG database, or in the individual case notes if not available on the database. The echocardiograms of all those patients identified as having a QRS duration >120ms were reviewed to identify those with LVEF <30%. The casenotes of these patients were reviewed to identify any major comorbidities.

Results: One hundred and ninety five patients were admitted to our hospital in 2005 with a diagnosis of acute myocardial infarction. Eighteen (9.2%) were found to have a QRS duration >120ms. Eight of these had LVEF <30%. Two patients died in hospital at the time of the index event, leaving six patients (3.1% of all acute myocardial infarctions admitted to our hospital) who would be eligible for ICD implantation under the new NICE guidelines. The cost to our institution would be approximately £88,500/year. These findings would translate to 30 new primary prevention ICD implants/million of the UK population/year. Current UK ICD implant rate is 50-60/million population/year.

Conclusions: There were major concerns that these guidelines would be unaffordable and they have not been routinely implemented. However, our local findings suggest that the number eligible for primary prevention ICD implantation is relatively small, approximately 3% of admitted myocardial infarctions, and that assuming similar results in other centres, the costs are not prohibitive.

Scottish Care Information Coronary Heart Disease Database: Summary Report of First Year of Data Entry

L Buttercase (on behalf of the SCI-CHD acute coronary syndrome steering group), Clinical Technology Centre, Ninewells Hospital, Dundee and Information and Statistics Division, NHS services, Scotland

The Scottish Care Information (coronary heart disease) acute coronary syndrome database has been in use in 16 centres throughout Scotland over the last 12 to 18 months. A total of 2423 patient episodes of care have been entered nationally, here we report a summary of this data and suggest ways that the information could be improved and used to improve patient care.

Fifty per cent of all patients presented within three hours of onset of symptoms. Twenty eight per cent of episodes (565) were diagnosed as ST elevation MI while 26% (530) had a diagnosis of NSTEMI. 10% and 9% were diagnosed as unstable angina (troponin positive) and unstable angina (troponin negative) respectively.

Sixty six per cent of patient episodes were managed by a non-cardiologist. Seventy four per cent of STEMIs were treated with thrombolysis and 3.4% by primary PCI. The commonest reason not to give thrombolysis was documented as "clinical decision" (47%). Rescue angioplasty was performed in 70% of patients with unsuccessful thrombolysis. In total 504 (24.7%) patients underwent coronary angiography and, of these, 302 (66%) had PCI and 19 (3.8%) had in-patient CABG. For patients with positive troponin, 49% underwent in-patient coronary angiography. 45% of patients had an in-patient echocardiogram.

These data provide the first detailed overview of patients with acute coronary syndromes in different geographic regions of Scotland. They highlight issues where improvements in use of specialist and invasive services could result in better quality care. Further data will be presented.

Transthoracic Echocardiography: a Survey of Current Practice in the United Kingdom

JR Dalzell¹, MR MacDonald¹, NM Hawkins², S Balmain³, JJV McMurray⁴, MC Petrie¹.

¹Department of Cardiology, Glasgow Royal Infirmary

²Department of Cardiology, Stobhill Hospital, Glasgow

³Department of Cardiology Royal Infirmary, Edinburgh

⁴Department of Cardiology Western Infirmary, Glasgow

Correspondence to: Jonathan R Dalzell, Department of Medical Cardiology, Glasgow Royal Infirmary, Glasgow, United Kingdom.
Email: j.dalzell@nhs.net

Introduction: High quality echocardiography is essential in the diagnosis and management of cardiovascular conditions. **Aim:** We aimed to assess the quality of echocardiographic services provided in the UK.

Methods: A questionnaire was sent to the chief cardiac physiologist in every hospital in the United Kingdom (UK) with echocardiographic facilities (n=336). **Results:** One hundred and twenty five hospitals responded (37.5%). The median number of echocardiograms performed per year was 3,500. The mean age of the primary echo machine was 3.3 years.

Staff and Accreditation: Cardiac physiologists perform echocardiograms in 98% of hospitals, and report in 88%. In terms of workload, cardiac physiologists perform and report over 80% of all echocardiograms in most hospitals (87%). In one quarter of hospitals (26%) all echocardiograms are performed and reported by cardiac physiologists. Only 57% of cardiac physiologists have a formal echocardiographic accreditation. Of those doctors reporting echos, only 22% are accredited.

Waiting lists: The median in-patient and out-patient waiting times were two (range 1-20) days and eight (range 0-40) weeks, respectively. Over 20% of hospitals have an in-patient waiting list of greater than five days and an out-patient waiting time of greater than four months.

Quality Control: Only 60% of hospitals had criteria that had to be met prior to an operator being allowed to report echos unsupervised. Only 48% of the hospitals perform regular audit of echocardiography scans and reports.

Diastolic Function: Ninety two per cent of hospitals included assessment of diastolic function in routine examinations. Twenty two per cent of these hospitals used E:A ratio alone.

Dysynchrony: Cardiac dysynchrony was assessed in 71% of hospitals. Of these, 29% performed "eye-ball" dyssynchrony assessment alone. Tissue Doppler techniques were employed in 39% of centres.

Mitral Regurgitation: Only 39% and 6% of hospitals calculated proximal isovelocity surface area and regurgitant volume, respectively.

Conclusion: In the UK, many transthoracic echocardiograms are performed and reported by operators without formally assessed competence. Less than half of hospitals regularly audited their service or used modern echocardiographic techniques. Services are likely to be improved by developing and instituting mandatory national guidelines.

An Audit of the Use of Treatment-Dose Enoxaparin in Medical Admissions with Chest Pain

JMB Farley¹, AR Payne², BP Murphy², AP Davie¹

¹Department of Cardiology, Southern General Hospital, Glasgow

²Department of Medical Cardiology, Glasgow Royal Infirmary

Introduction: On the basis of large-scale clinical trial data, low molecular-weight heparins (LMWH), in particular enoxaparin, have largely replaced unfractionated heparin (UFH) in the treatment of acute coronary syndromes. The ease of administration and lack of monitoring required were major factors in this change in clinical practice. This convenience could easily lead to the overuse of this potent anticoagulant. An adverse event in our unit led to safety concerns about the low threshold for prescribing LMWH for patients with chest pain, so we conducted an audit of our practice. **Methods:** During the first audit cycle (one calendar month) patients prescribed treatment dose LMWH were identified by reviewing the drug charts of all medical admissions. The case notes were reviewed to determine whether administration of LMWH was appropriate. An objective assessment was made based on the entry criteria for the major clinical trials comparing LMWH and UFH. For the prescription of LMWH to be appropriate the patient must have presented with cardiac chest pain and either an abnormal ECG or a known history of coronary disease. For patients who received LMWH but did not fulfil these entry criteria, the prescription of LMWH was deemed inappropriate. The final diagnosis was correlated with the appropriateness of LMWH use. The case notes of all other admissions over that same month who had a positive troponin but were not included in the audit were reviewed to assess the incidence of inappropriate omission of LMWH when the clinical trial entry criteria were met. The results were presented at a hospital meeting, and posters with the results and criteria for use of LMWH based on the clinical evidence were posted around the hospital. The audit cycle was then repeated.

Results: Sixty two patients received LMWH in the first audit cycle. Twenty seven patients (44%) received this appropriately, and 35 patients (56%) received LMWH inappropriately. Acute coronary syndrome was the final diagnosis in 21 (78%) of the appropriate group and 3 (9%) of the inappropriate group. One patient with a positive troponin met the criteria for LMWH prescription, but did not receive it. During the second audit cycle, only 13 patients received LMWH. This was appropriate in all 13 cases (100%). Again one patient with a positive troponin should have received LMWH but did not. **Conclusions:** We have shown that LMWH is overused in patients with chest pain, exposing low risk patients to potential harm. A simple poster-based education campaign dramatically reduced the inappropriate use of LMWH with no apparent increase in inappropriate omission of this evidence based therapy.

Surgical Repair and Valve Replacement for Degenerative Mitral Valve Prolapse in South East Scotland 2001-2005

P Henriksen, M Bhana, E Brackenbury, P Bloomfield M Denvir

The Royal Infirmary of Edinburgh

Background: Asymptomatic severe mitral regurgitation is a serious disease, with a five-year rate of death from any cause of 22%. Technical improvements in surgery, decreased operative mortality and increased repair rates allow the restoration of patients' life expectancy and single centre studies have advocated surgical repair in patients with severe asymptomatic mitral regurgitation. A retrospective review of echocardiographic and clinical outcomes in patients with degenerative mitral valve prolapse referred for surgery at the Royal Infirmary of Edinburgh was conducted. **Method:** A list of patients with diagnostic codes for mitral valve repair, mitral valve prolapse and mitral valve replacement was screened. Patients with endocarditis, primary annular dilatation and functional MR were excluded. **Results:** Four hundred and seventy six cases were screened and 132 were identified with primary degenerative mitral valve prolapse. Sixty seven patients had mitral valve repair and 65 had mitral valve replacement. In the repair group, one patient died following a perioperative-MI during re-do valve replacement surgery. In the replacement group three cases developed paraprothetic leaks requiring early corrective surgery and one patient had an ischaemic stroke with mild residual impairment. Complete pre and post-operative transthoracic echo data were available in 59 out of 67 cases with mitral valve repair. Thirty three had repair of isolated P2 scallop prolapse, 11 had extensive posterior leaflet prolapse, 12 had bileaflet disease and three had isolated anterior leaflet disease. Post-operative mitral regurgitation grades are shown in the table below. There was a significant trend towards reduced LV systolic function post-operatively following both mitral valve repair and mitral valve replacement. Pulmonary artery pressure estimations from the tricuspid regurgitant jet were available in 40 out of 67 cases. Pulmonary artery pressures were elevated in 25/40 pre-operatively and fell post-operatively in 21/25 cases (a fall to normal pulmonary pressure in 9/25 and mild residual elevation in 11/25). NYHA status was available in 40/67 cases. Six out of forty were entirely asymptomatic and one from this group reported new symptoms post-operatively. Thirty three out of forty with NYHA 1-4 heart failure symptoms reported improved NYHA scores with one patient noticing no change. Information on pre-operative planning with respect to the possibility of mitral valve repair was available in 43 of 65 patients who received a valve replacement and in 13/43 the valve was felt to be repairable prior to surgery. **Conclusions:** Audit is an essential part of ensuring good practice and a recent BCS working group underlined the importance of pre and post-operative echocardiographic review for monitoring the results of mitral repair. The data were incomplete and this reflected difficulty obtaining records from 11 hospitals across south-east Scotland. An excellent result with no or trivial residual MR following mitral repair was achieved in 54% cases. A proportion of cases (as many as 10%) referred for planned repair had a replacement instead. The high proportion of patients with pre-operative symptoms and post-operative LV dysfunction possibly indicates that some referrals were not made early enough.

Outcome and Complications of Electrical Cardioversion for Persisting Atrial Fibrillation.

A Mirchandani¹, C Gibson², P Docherty², S Hood², P Macintyre², I Findlay².

¹Western Infirmary Glasgow

²Royal Alexandra Hospital Paisley

We audited 689 consecutive patients (1999-2005) undergoing elective cardioversion for atrial fibrillation (AF). Cardioversion was performed under benzodiazepine sedation in 35% over the study period and in 50% of patients in the last two years of the study. We assessed cancellation and success rates, immediate complications, in-hospital mortality, post-procedure complications and re-admission rates six weeks post procedure. Six hundred and eighty nine cardioversions were planned over 87 months in 378 patients (age 64.9 years) (233 males, 61.6%). 189 (27.1%) procedures were cancelled: 83 (43.9%) due to spontaneous return to SR, 68 (36.0%) due to INR <2.

Five hundred procedures were performed in 380 patients. Four hundred and seven (81.4%) were successful. There were no deaths and complication rate was 2.6% (13 cases). Eleven had bradyarrhythmias, four had respiratory complications. Nine (1.8%) required immediate admission, 14 (3.68%) within six weeks of procedure (table). Fifty four patients (14.2%) who received electrical cardioversion were re-admitted > 6 weeks during the study period (table).

Conclusions: Cardioversion is a relatively safe procedure with only 1.8% requiring overnight observation. The main reason for readmission was atrial fibrillation in both the early and late periods. Thrombo-embolic events were extremely low. The significant cancellation rate (27.1%) is largely unavoidable due to spontaneous reversal to sinus rhythm but a significant proportion could be prevented with improved anticoagulation monitoring.

Cardioversion under benzodiazepine sedation is a feasible and flexible alternative to formal anaesthetic induced sedation.

Nurse-led Chest Pain Triage; Meeting the Challenge of Non ST Elevation Acute Coronary Syndromes.

LM O'Neill, DHJ Elder, NG Dewhurst, PF Currie

Department of Cardiology, Perth Royal Infirmary

Background: Patients admitted to hospital with acute coronary syndromes (ACS) are at high risk of early death and poor outcome. This may be reduced by prompt therapeutic intervention. While the effectiveness of nurse-initiated thrombolysis for patients with ST elevation myocardial infarction (STEMI) has been established, data on nurse-led chest pain triage for other ACS patients are lacking. **Aim:** To evaluate the existing standard of care of patients presenting with Non ST elevation Myocardial Infarction/Unstable Angina (NSTEMI/UA) at a district general hospital and to assess the impact of the introduction of nurse-led chest pain triage. **Methods:** A 12 week, prospective case note review of 282 patients admitted with chest pain was undertaken to examine time to assessment or treatment and delivery of evidence-based ACS drug therapy. A new model of CCU based, chest pain triage was then introduced which involved nurse-led assessment, risk stratification and treatment initiation. A further six month retrospective case note audit of chest pain patients admitted through triage was then carried out. NSTEMI/UA patients were deemed high risk with a TIMI score ≥ 4 or TIMI score <4 with dynamic ECG changes or a detectable troponin. **Results:** The prospective audit identified 157 possible ACS cases (30 STEMI) including 80 with high-risk criteria. One hundred and five patients (five STEMI and 35 high risk NSTEMI/UA) were admitted through the triage service operational on a weekday, nine to five basis. Nurse led triage brought about improvements in the time to initial assessment with 94% (99/105) patients seen within five minutes of arrival, time to initial ECG (101/105 (96%) within 10 minutes vs. 76/157 (48%), $p < 0.001^*$). The use of anti-platelet therapy and LMW heparin for high-risk patients also improved. 80% (28/35) received clopidogrel compared to 45% (36/80) pre-triage ($p < 0.001^*$) and 97% (34/35) received LMW heparin compared to 80% (64/80) pre-triage ($p < 0.05^*$).

An unexpected reduction in the initial use of beta-blockers was noted (74% vs. 93% ($p < 0.05^*$)). The use of clopidogrel in low risk patients with chest pain thought to be of cardiac origin increased (20/34 (59%) vs. 11/41 (27%) $p < 0.01^*$) but no differences in the prescription of aspirin, heparin or beta-blocker for low risk patients were noted.

* by Fisher's exact test

Conclusion: A CCU based, nurse-led chest pain triage service may be an effective means of providing accurate and prompt assessment and improved clinical management of ACS patients presenting to district general hospitals.

LMO'N was supported by a BHF ACS specialist nurse grant. Audits were carried out with financial support from MSD pharmaceuticals and Innovex.

Atrial Fibrillation Ablation: Report of the First 100 Cases at Glasgow Royal Infirmary

AR Payne, AD McGavigan, FR Quinn, AP Rae, DT Connelly

Glasgow Royal Infirmary

Introduction and Aims: Radiofrequency ablation (pulmonary vein isolation: PVI) is being increasingly employed as a treatment for drug resistant atrial fibrillation (AF) with reported success rates in the literature of 75-90% following one to three procedures with a complication rate of up to 6%. AF ablation has been performed at our institution since December 2004 and we report the results of our first 100 cases.

Methods: This study was a case series review. The first 100 PVI procedures were identified from the Cath Lab database (December 2004-October 2006). The notes were reviewed and a comprehensive data collection sheet was completed. This detailed pre-procedure demographics, intra-procedural statistics and post-procedural outcomes up to at least six months. **Results:** Of the 100 cases, 81 were first procedures and 19 were repeat procedures. Patients were referred from 21 different hospitals and 21% came from outside the west of Scotland area.

Mean age was 55.6 (range 30-72) and 79% of patients were male. Seventy eight per cent of patients were in paroxysmal AF and 22% had persistent AF. Patients had been experiencing AF for an average of 85 months and 35% had undergone DC cardioversion at least once. Patients had been prescribed an average of 3.4 anti-arrhythmic medications (range 1-6) and 63% had been on amiodarone.

Mean duration of procedure was 168 minutes (range 68 to 270) and 92% of procedures were completed. Thirty per cent of patients required internal cardioversion at the end of the procedure and six of these also required IV flecainide. Average stay was 1.36 nights (range one to six nights). Incidence of major adverse events was 8% and there were six minor adverse events.

Major adverse events were: tamponade/pericardial drain insertion (three); death (one); pulmonary oedema (one); ocular embolus (one); pericarditis leading to hospital re-admission (two).

Of the 81 first procedures, 50 (61%) had symptomatic improvement or cure. Twenty-two of the remaining 31 patients underwent a second procedure, increasing success rate to 77%. Patients with persistent AF benefited as much as those with paroxysmal AF (61% and 58% symptomatic improvement) from their first procedure. Comparison of these two groups for second procedures was not possible (low numbers).

Conclusion: Our symptomatic success rates were in keeping with those in published literature. Tamponade and embolic rates are comparable with other centres. The procedure appears to benefit patients with paroxysmal and persistent AF equally, although this may reflect careful selection of suitable 'persistent' patients.

The Relationship Between Index of Microcirculatory Resistance and LV Volumes on CMR Imaging in ST Elevation Myocardial Infarction.

RJ McGeoch¹, S Watkins¹, R Good¹, C Berry¹, KJ Hogg², AP Rae³, M Petrie³, H Eteiba³, MM Lindsay¹, SD Robb¹, WS Hillis¹, HJ Dargie¹, KG Oldroyd¹.

¹Department of Cardiology, Western Infirmary, Glasgow, United Kingdom

²Department of Cardiology, Stobhill Hospital, Glasgow, United Kingdom

³Department of Cardiology, Glasgow Royal Infirmary, Glasgow, United Kingdom

Background: The status of the coronary microvasculature in patients with acute myocardial infarction (AMI) is known to independently influence left ventricular function. Current methods for assessing microvascular dysfunction in this patient population have limitations. We compared the novel coronary pressure-wire derived index of microcirculatory resistance with left ventricular volume assessment by cardiac magnetic resonance imaging (CMR). **Methods:** Twenty consecutive patients who underwent PCI for ST-elevation AMI were included. Using a coronary pressure sensor/temperature tipped guidewire within the culprit vessel we measured distal coronary wedge pressure (CWP) and baseline mean transit time (Tmn) of a 3ml bolus of saline injected into the coronary ostium. After inducing coronary hyperaemia with intravenous adenosine (140mcg/kg/min) we measured hyperaemic Tmn, distal coronary pressure (Pd) and aortic pressure (Pa). Index of microcirculatory resistance (IMR) was calculated. The patients then underwent a gadolinium contrast enhanced CMR at 24-48h post procedure. LV dimensions were assessed using retro-gated (trueFISP) cinematographic breath-hold sequences. **Results:** Successful coronary physiological measurements were made in the twenty patients. Nine patients underwent primary PCI, six rescue PCI and five PCI within 24 h of electrocardiographically successful thrombolytic reperfusion therapy. IMR correlated significantly with LV end systolic volume ($r = 0.531$ $p = 0.016$) and LV ejection fraction ($r = -0.568$ $p = 0.009$). Mean transit times at hyperaemia also correlated with LVESV ($r = 0.494$ $p = 0.027$) and there was a trend towards ejection fraction ($r = -0.426$ $p = 0.061$). There was no correlation with LV end diastolic volume. IMR also correlated with peak Troponin T ($r = 0.464$, $p = 0.039$). **Conclusions:** IMR is known to be a marker of microvascular dysfunction. This study shows a relationship between IMR and LV damage as assessed by CMR imaging in patients following ST – elevation myocardial infarction. Potentially this relatively simple wire based technique could be used at the time of PCI as a predictor of myocardial damage.

Eplerenone Attenuates Left Ventricular Remodelling in Patients with Acute Myocardial Infarction and Left Ventricular Systolic Dysfunction

RAP Weir, A Murphy, PB Mark, CJ Petrie, T Steedman, S Clements, I Ford, JJV McMurray, HJ Dargie

Introduction: Eplerenone reduces morbidity and mortality in patients with left ventricular systolic dysfunction (LVSD) and heart failure (HF), or diabetes, after acute myocardial infarction (AMI). To interrogate the most likely reason for this beneficial effect on outcome and to determine whether eplerenone might have a broader indication after AMI we performed a cardiac magnetic resonance imaging (CMR) study to assess the effect of this agent on left ventricular (LV) remodelling in patients with AMI and LVSD but without HF or diabetes. **Methods:** We performed CMR and measured serum BNP and NTproBNP in 100 patients with AMI (LV ejection fraction $< 40\%$ on echocardiography) at a mean 4.2 days after AMI. Patients were then randomised in a double-blind fashion to receive eplerenone or placebo for a period of six months, at the end of which CMR and bloods were repeated and study drug was withdrawn. The primary end-point was change in LV end-systolic volume index (LVESVI). Analysis was by intention to treat, with a pre-specified covariate adjustment to take account of any baseline imbalances. **Results:** Mean age (\pm SD) was 58.9 ± 12.0 years (77% male). Seventy eight per cent underwent revascularisation before randomisation, 93% were discharged on a beta blocker and 94% on an ACE inhibitor.

There were, by chance, significant imbalances between the two groups at baseline. We used a stepwise selection model to detect the baseline variables that were prognostic of LVESVI at six months, to which were added all variables that had a trend to imbalance ($p < 0.1$) at baseline. Following adjustment for these covariates (Table I), the treatment effect of eplerenone on LVESVI over six months was -6.1 ± 2.7 ml/m² ($p = 0.027$). There were no significant between treatment-group differences in change in NTproBNP (-1876 ± 1551 pg/ml [eplerenone] v -1616 ± 2212 pg/ml [placebo], $p = 0.512$) or BNP (-148 ± 130 pg/ml [eplerenone] v -96 ± 208 pg/ml [placebo], $p = 0.155$) over the six month period from baseline. **Conclusion:** In a population of AMI patients with a very high uptake of contemporary anti-remodelling medical therapy and a high revascularisation rate, eplerenone significantly attenuated LV remodelling after AMI in patients with LVSD.

ABSTRACTS OF SOCIETIES

Scottish Society for Rheumatology

Perth, November 2nd 2007

C-Reactive Protein: an Underlying Cause of Microvascular Dysfunction in Rheumatoid Arthritis?

B Galarraga, F Khan, P Kumar, T Pullar, JF Belch.

Vascular and Inflammatory Diseases Research Unit, The Institute of Cardiovascular Research (TICR), Ninewells Hospital and Medical School, Dundee

Background: Rheumatoid arthritis (RA) is a chronic autoimmune inflammatory arthritis associated with increased cardiovascular (CV) morbidity and mortality. Endothelial dysfunction, a marker of early atherosclerotic disease, has been reported in large vessels in RA. Little is known about the microvascular function. The objective of this study was to assess forearm microvascular endothelial function in patients with RA and to determine its relationship to disease activity, inflammation and other parameters of RA. **Methods:** One hundred and twenty eight RA patients with no previous history of CV disease were studied. Endothelium dependent and independent forearm skin microvascular function was measured using laser Doppler imaging after iontophoretic delivery of acetylcholine (ACh) and sodium nitroprusside (SNP) respectively. Parameters of RA disease activity and inflammation were also checked. **Results:** There were significant negative correlations between C-reactive protein (CRP) and endothelium dependent vasodilatation (ACh) ($r_2 = -0.221$, $P = 0.013$ Spearman Rank correlation test) and between CRP and endothelium independent vasodilatation (SNP) ($r_2 = -0.204$, $P = 0.016$ Spearman Rank correlation test). Moreover, when RA patients were divided in two subgroups according to their systemic inflammatory status (CRP > 10mg/L v CRP < 10mg/L), the high CRP group showed significantly lower vasodilatory responses to ACh ($P = 0.018$ ANOVA) and SNP ($P = 0.05$ ANOVA) than the low CRP group. There were no significant correlations between Disease Activity Score 28 (DAS28), rheumatoid factor positivity, presence of erosions or duration of RA disease with microvascular responses. **Conclusions:** In this large cross sectional study we found, for the first time, systemic inflammation (CRP) to be a strong contributor to microvascular dysfunction in patients with RA.

Comparison of anti-MCV Antibodies and anti-CCP 2 Antibodies (Phadia) against Rheumatoid Factor in Patients with Rheumatoid Arthritis and Early Inflammatory Arthritis.

E Pathan, M Kadlubowski, PL Yap, M Gray.

Glasgow Royal Infirmary

Background: CCP antibodies are now widely used as a specific marker for rheumatoid arthritis. We aimed at studying the sensitivity and specificity of anti-CCP antibodies against rheumatoid factor (RF) in

routine rheumatology practice. We compared two different commercially available kits: anti-CCP2 antibodies (EliA, Phadia) & anti-MCV antibodies (Orgentec) against RF. **Methods:** All members of rheumatology staff were asked to request anti-CCP antibodies in those patients that they would normally request a RF over a seven month period between September 2006 and March 2007. All samples received in the immunology laboratory for anti-CCP testing were subjected to anti-MCV [0-20 IU] and anti-CCP2 (Phadia) [0-20 IU] testing. RF [0-20 IU] was also carried out unless this had already been done within three months prior to the anti-CCP sample. At the end of the seven month period, laboratory results were collated onto a database. Clinical data was then collected through outpatient letters specifically looking for ACR criteria for diagnosis of RA. Sensitivity, specificity, positive and negative predictive values were calculated for each test. **Results:** A total of 305 patients had anti-CCP antibodies requested but data was available on 290 patients. One hundred and twenty three patients (42.4%) satisfied ACR criteria for diagnosis of RA while the remaining 169 (58.27%) fell into other diagnostic categories. Anti-MCV antibodies were the most sensitive (56.9%) as against 53.65% for RF and 49.5% for Phadia. However, Phadia was the most specific (94.6%) as against 79.64% for RF and 86.2% for anti-MCV antibodies. Combining RF with either anti-MCV or Phadia only marginally improved specificity and reduced sensitivity. **Conclusion:** Anti-CCP antibodies are much more specific but not as sensitive as RF. They could replace RF in the screening of patients for RA by general practitioners. RF will still be needed by rheumatologists unless ACR criteria are modified. In our hands, the Phadia kit proved more specific than anti-MCV antibodies in RA diagnosis.

The Utility of an Ankylosing Spondylitis Quality of Life Questionnaire (ASQoL) in an Outpatient Setting.

CD Campbell, C Lam, RD Sturrock

Centre For Rheumatic Diseases, Glasgow Royal Infirmary

Background: Quality of Life issues are often neglected in the evaluation of Rheumatic Disease patients but are important in assessing the global impact of disease on an individual patient. The ASQoL "Ankylosing Spondylitis Quality of Life" questionnaire was developed as a means of assessing the impact of disease in Ankylosing Spondylitis (AS) from the patients' perspective.¹ The questionnaire comprises 18 items assessing different areas of functioning including physical mobility, energy, pain, emotional reaction, sleep and social isolation. We have used this instrument to determine the impact of AS on quality of life in patients attending a specialised clinic for AS. **Methods:** ASQoL questionnaires were given to 65 unselected patients attending an AS outpatient clinic. All results were anonymised. The patients were instructed to answer "yes" or "no" for each question, and one mark was given for each affirmative answer. **Results:** Sixty five questionnaires were returned, representing a 100% response rate. Of the total of 1170 questions answered, there were 11 items of missing data (0.1%). A score out of 18 was calculated for each patient. The scores ranged from 0 to 18, with a mean of 10.3. Two patients scored 0/18 (i.e. "higher" quality of life), whereas seven scored 18/18 ("poorer" quality of life). On further analysis questions receiving the highest number of affirmative answers included item 12 "I get tired easily" which was answered "yes" by 78% of patients whereas items four ("I struggle to do jobs around the house") and 10 (It takes a long time to get going in the morning") received 46 positive responses (i.e. affecting 71% of patients). Sixty eight per cent of the patients had constant pain and 52% admitted to feeling tearful; "I sometimes feel like crying" **Conclusion:** This has given us valuable insight into the affect of disease on the lives of AS patients, including emotional aspects, and feelings of social isolation, which may not always be apparent at a routine outpatient consultation. We have highlighted that a high percentage of our patients are affected by such issues. It is therefore important to utilise this information to try and improve the quality of life of our patients. There is evidence that the ASQoL questionnaire is a reliable and valid assessment tool.² Its limitations are that it does not however assess all areas which have been found to be important aspects of quality of life for patients (eg body image, walking and work outside the home). In addition, by allowing only "yes" or "no" responses, there is no descriptive detail obtained in the answers, and it does not allow the patient to state the degree to

which they are affected. In order to address the limitations of the ASQoL, our department is currently involved in "The Ankylosing Spondylitis Quality of Life study" which aims to develop an instrument, which includes detailed descriptions of health and quality of life including aspects, which is important to AS patients.

A Pilot Study of Non-Steroidal Anti-Inflammatory Drug Withdrawal in Patients with Stable Rheumatoid Arthritis

G McKellar, R Hampson, A Tierney, HA Capell, R Madhok

Glasgow Royal Infirmary

Background: Non-steroidal anti-inflammatory drugs (NSAIDs) provide symptomatic relief in rheumatoid arthritis (RA), with cyclo-oxygenase-2 inhibitors (COX2s) providing increased gastro-protection. Many patients regularly take anti-inflammatories despite good control of arthritis on disease-modifying anti-rheumatic drugs (DMARDs) or biologic therapy. Recent publications on the cardiovascular (CV) safety of conventional NSAIDs and COX2s have led to a reassessment of which patients should be prescribed these drugs; guidelines suggest that the lowest dose should be used, for the shortest time possible. The purpose of our study is to assess the feasibility and acceptability of withdrawing prescribed conventional NSAIDs or COX2s from patients with current good control of RA and also to assess over a 12 week period whether this withdrawal influenced disease control, blood pressure, gastrointestinal symptoms or renal function. **Methods:** Seventy five patients with RA from one hospital clinic on conventional NSAID / COX2 were approached. Inclusion criteria included seropositivity (to ensure a homogenous group for comparison), disease activity score (DAS44) ≤ 2.8 , stable dose DMARD and administration of NSAID / COX2 on ≥ 25 out of 30 days per month. Those with concurrent diagnoses of fibromyalgia, severe osteoarthritis or with planned operative intervention were excluded as it was felt that their NSAID use may not reflect RA requirement. All patients were seen at six and 12 weeks and offered intervention if their RA had flared from previous visit. **Results:** Thirty patients (58% of those screened) were recruited and conventional NSAIDs / COX2s withdrawn for 12 weeks. Baseline demographics: 22 female, eight male (73% vs. 27%), median age 59 years (F 55y, M 61y), median DAS44 2.1, baseline median blood pressure (BP) 141/87mmHg. A total of only 13 "steroid interventions" were required in the 30 patients over the 12-week study period – the equivalent of 0.25mg triamcinolone acetonide, or 0.3mg prednisolone, per patient per day over the 12 weeks. Only one person required an increase in dose of DMARD. No overall change was seen with ESR or DAS over the 12-week intervention period. Pain score increased significantly from baseline to six weeks ($p < 0.0001$) but fell towards baseline values for the 12-week value ($p = 0.008$). A significant reduction in systolic blood pressure was seen – an average drop of 5mmHg from baseline to six weeks: 141 to 136mmHg ($p = 0.025$) and of 7mmHg from baseline to 12 weeks: 136 to 143mmHg ($p = 0.037$). No significant change in diastolic blood pressure was observed. The proportion of patients with no GI symptoms increased by six weeks and this figure was maintained to 12 weeks. A trend towards significance was seen with fall in urea, but no significant change in creatinine was seen. **Conclusion:** Overall this pilot study was well accepted by the majority of the patients approached and showed an improvement in blood pressure and GI symptoms without deterioration in disease control or prolonged increase in pain score. None of the participants has to date chosen to recommence regular NSAID therapy. If this initiative were to be rolled out on a larger clinical scale, it would be anticipated that relatively little additional input from medical staff would be required with potential gain in terms of BP control, renal function and GI symptoms. Since the majority of RA patients have additional risk factors which contribute to increased CV disease, the acceptability of NSAID withdrawal, perhaps even in those with a higher DAS, may prove highly relevant to longer term outcomes.

Anti-TNF Therapy in Scotland: the Current State of Play

G MacDonald, J Harvie, M Steven

Rheumatology Department, Raigmore Hospital, Inverness

Background: Biologic therapies have played an increasingly important role in the treatment of rheumatoid arthritis (RA), psoriatic arthritis (PsA) and ankylosing spondylitis (AS). Significant cost implications have restricted the use of biological treatment in Scotland, and UK as a whole, to those who fulfill the BSR/NICE criteria. **Methods:** We studied the number of patients receiving biologic therapies in Scotland and regional variation in use was compared by a questionnaire sent to all Scottish Rheumatology centres in 2006 and repeated in 2007. **Results:** (Table 1.): In 2006 there were 1,059 (~2.11/ 10,000) patients in Scotland on biologic therapies. This increased to 1,549 (~3.10/ 10, 000) in 2007. RA accounts for over two-thirds of these but there are increasing numbers for both PsA (193 patients) and AS (134 patients). Regional variation was less in 2007 but cross boundary flow confounded some regional data. **Conclusion:** The number of patients with RA eligible to receive biologic therapies was estimated at 40-50 patients per 100 000 in a business case prepared by the BSR. Current Scottish usage lags behind an estimated 2000 to 2500 eligible patients and the number on biologic therapies remains below that of many EU countries and the United States.

The Effects of Rosuvastatin on SF-36 in Patients with Rheumatoid Arthritis.

M Rajput-Ray¹, P Kumar², JF Belch¹

¹The Institute of Cardiovascular Research, Division of Medicine and Therapeutics, Ninewells Hospital and Medical School, Dundee

²Perth Royal Infirmary, Perth

Background: Rheumatoid arthritis (RA) is a physically disabling and emotionally draining disease with an increased cardiovascular mortality. The role of cardioprotective agents such as statins, which also have lipid lowering properties in rheumatoid arthritis is still to be clearly defined. SF-36 is validated to measure physical and mental disability in RA. Consisting of eight categories it is broadly divided into two components: physical (PhysicalFunction, RolePhysical, BodilyPain, GeneralHealth) and mental (MentalHealth, RoleEmotional, SocialFunction, Vitality). Our primary study objective was to evaluate the effects of a particular statin, rosuvastatin, on the physical and mental components of SF-36 in patients with RA. Our secondary objective was to assess correlation of the primary objective to markers of disease progression e.g. C-reactive protein (CRP). **Methods:** This was a sub-study of the "Rosuvastatin in Rheumatoid Arthritis" or "RORA" trial (currently in press Kumar, Belch et al; Annals of Rheumatic Diseases). 50 rheumatoid arthritis patients underwent a double blind placebo-controlled trial on either rosuvastatin 10mg once a day or placebo. The SF-36 questionnaires were filled in at baseline and six months. Help was available by relatives and/or the research nurse to complete the SF-36 questionnaire. **Results:** Forty two patients completed the study. Of particular interest was the MentalHealth score at baseline 51.7(± 6.2), mean(\pm sd) for the active group which went up to 53.0(± 9.1) at the end of six months. Pearson correlation of MentalHealth score to CRP = 0.4, $p = 0.09$. **Conclusion:** Rosuvastatin did not have any statistically significant effect on the individual physical and mental scores of SF-36. However, there was a trend towards improvement in mental health and total mental component over a period of six months in the Rosuvastatin group. The improvement in MentalHealth score probably correlates with an improvement in CRP though neither reached statistical significance.

Scottish Gout Audit*ME Perry, E Murphy*

Glasgow

Background: Gout is a common condition but evidence regarding its management is lacking and hence there is a wide variation in practice in managing these patients. We audited the current practice of diagnosis and management of gout in Scotland. **Methods:** The European League Against Rheumatism (EULAR) recently published the first international guidelines on the diagnosis and management of gout for several decades.^{1,2} An audit form based on these recommendations was developed and circulated electronically to rheumatologists in Scotland between June and September 2007. **Results:** Fifty nine patients were included in the audit (51M, 8F). Mean age 62 years, with 38 patients being seen as out-patients and 21 as in-patients. Forty six patients had severe pain, swelling and tenderness within 6-12 hours of onset and 47 patients had overlying erythema. Thirty one patients had gout confirmed by polarized light microscopy either historically or at time of audit. Twenty two patients had microbiological culture of synovial fluid performed. All patients were diagnosed after the age of 25 years, six had a family history of gout, three had previous renal calculi, and three had previously had renal uric acid measured. Recurrent attacks had occurred in 40 patients. Mean BMI: 28. Serum urate elevated in 32 patients; blood glucose normal in 36 patients, was not measured in 14, with seven diabetics. Mean BP 147/81. Lipids not measured in 18 patients, elevated or on cholesterol lowering treatment in 32 patients. Only four were not given lifestyle advice. Acute treatment included NSAID (28 patients), colchicine (18), oral prednisolone (10), IA/IM steroid (10). Tophi were present in 10 patients, radiological changes in 12. Long-term treatment included allopurinol (33 patients), colchicine (one) and allopurinol and losartan (three). Seventeen patients were taking diuretics, and 16 were taking an ACE inhibitor or angiotensin receptor blocker (ARB) **Conclusions:** The diagnosis of gout remains clinical in a sizable minority of patients. The audit has highlighted the need for diagnostic confirmation by crystal analysis and for greater assiduity paid to lipid and glucose measurement. Most patients are treated acutely with NSAIDs, colchicine or steroids and have allopurinol for long-term prophylaxis in keeping with the EULAR guidelines. The uricosuric (ARB) losartan could be used instead of an ACE inhibitor in patients already prescribed the latter, especially given the likely anti-inflammatory properties of the former.³

Poster Presentations**Infections in Rheumatology Patients; Influence of Traditional DMARDs or TNF Blockers***S Smith¹, R Will¹, J Dale², A Stirling², J Hunter²*¹University of Glasgow Medical School²Department of Rheumatology, Gartnavel General Hospital, Glasgow**Use of Rituximab in Rheumatic Diseases: Experience from One Unit.***J Dale, A Stirling, M-M Gordon*

Department of Rheumatology, Gartnavel General Hospital, Glasgow

Anti-CCP testing in Fife*J. Gibson¹, C Lafong², R Jones²*¹Fife Rheumatic Diseases Unit, Cameron Hospital, Windygates, Fife, KY8 5RR Tel. 01592 226811 e-mail janegibson@nhs.net²Department of Medical Microbiology and Infection Control, Victoria Hospital, Hayfield Road, Kirkcaldy, KY2 5AG