The use of telemedicine for ECG interpretation in primary care

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triglycerides, and lower high-density lipoprotein cholesterol (see table). The prevalence of LVH was lower among Indian Asians than European whites (2.0% vs 2.6%, p<0.001). LVH was positively correlated with age, male gender, blood pressure, and inversely related to body mass index, WHR and body surface area. In regression analysis, the prevalence of LVH remained lower among Indian Asians than European whites, despite adjustment for differences in age, gender, body mass index, WHR or body surface area between Indian Asians and European whites (odds ratio (OR) 0.78, 95% CI 0.68 to 0.95, p<0.001).

Conclusions: As assessed by surface ECG and using Sokolow–Lyon criteria, LVH is less common among Indian Asians than European whites. These findings contrast the strikingly higher prevalence of hypertension and type 2 diabetes, and the approximately twofold increased risk of CHD among Indian Asians compared with European whites. Although further studies are needed to evaluate the sensitivity and specificity of ECG criteria for diagnosing LVH in Indian Asians, our findings demonstrate that LVH (as determined by the surface ECG) does not predict the increased risk of CHD among Indian Asians.

053 AUTONOMIC REGULATION IN ADOLESCENTS AFTER RAPID ASCENT TO 3454 METRES

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Increasing numbers of children and adolescents are travelling to destinations situated at high altitude and are subsequently exposed to altitude-related hypoxia and its potential health risks. Rapid ascent to high-altitude triggers sympathetic activation in adults, which can be detected by measurements of heart rate variability (HRV) and contributes when exaggerated to the pathogenesis of high-altitude pulmonary oedema. Data in children on autonomic regulation after rapid ascent to high altitude are lacking. The aim of this study is to characterise autonomic regulation in healthy children and adolescents during short-term exposure to high altitude. 97 healthy children and adolescents (mean ± SD age, 11.9 ± 2.2 years, range 7–17 years, 47 girls and 50 boys) participated in the study. HRV was measured from 5 minutes ECG recording at low altitude (450 m) and 24 h after arriving at the high altitude research station of the Jungfraujoch in Switzerland (3454 m asl). Time domain analysis demonstrated an increase in heart rate in all subjects from low to high altitude (74 ± 9 vs 97 ± 13 bpm, p<0.0001) and a decrease in the standard deviation of normal intervals in all subjects from low to high altitude (7.3 ± 2.3 vs 5.3 ± 2.2, p<0.0001). Frequency domain analysis demonstrated a significant absolute decrease from low to high altitude in total, high and low-frequency powers calculated with linear and non-linear models. In normalised units there was a significant increase of low frequency powers on ascent to high altitude (43.9 ± 17.3 vs 56.9 ± 21.0, p<0.0001). The same was observed with a non-linear (autoregressive) model, in which the amount of low-frequency powers in normalised units increased on ascent to high altitude (51.1 ± 23.3 vs 64.3 ± 20.1, p<0.0001) and the low-frequency/high-frequency ratio increased significantly from low to high altitude (2.04 ± 2.36 vs 4.72 ± 7.10, p = 0.0007). We report here the first study on autonomic regulation in a large group of healthy low-altitude-resident children and adolescents after rapid ascent to high altitude. Children respond similarly to adults with sympathetic activation, an important mechanism in the pathogenesis of high-altitude pulmonary oedema.

054 REORGANISATION AND DEVELOPMENT OF A CONSULTANT-LED CARDIOLOGY SERVICE LEADS TO SUBSTANTIAL REDUCTIONS IN LENGTH OF STAY, ALL-CAUSE INHOSPITAL AND 30-DAY POST-DISCHARGE MORTALITY IN ACUTE CORONARY SYNDROMES

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Background: East Lancashire Hospitals NHS Trust (ELHT) reorganised its services in October 2007 with all acute admissions sent to one site (Royal Blackburn Hospital). This allowed the development of a 24/7 consultant-led cardiology service (three newly appointed interventional and three non-interventional cardiologists). Management of a new 10-bedded coronary care unit was taken over by the cardiologists who also provided a daily ward round in the medical admissions unit and the general cardiology ward. The emphasis was on the early recognition of the high to intermediate risk patients who were most likely to benefit from assessment and management directed by consultant cardiologists.

Methods: We performed an audit of all patients admitted with acute coronary syndromes (ACS) between two periods: group 1—between October 2006 and September 2007 and group 2—between October 2007 and September 2008. The data were obtained from the MINAP database. We looked at the following endpoints: length of stay, inhospital and 30-day postdischarge all-cause mortality.

Results: 633 patients were admitted between 2006 and 2007 and 748 patients between 2007 and 2008. The mean age was higher (70.3 vs 68.2 years; p = 0.006) and there was a greater proportion of women (42% vs 35%; p = 0.008) in group 1. There was no difference between the two groups in terms of the number of patients with diabetes or hypertension at admission. There was a significant reduction in the length of stay from a median (interquartile range) of 7 days (5–11) to 5 days (3–9); p<0.0001. The number of transfers to the regional tertiary centre for acute angiography increased from 95 (15%) to 241 (32.2%); p<0.0001. The inhospital mortality reduced from 15.6% (n = 99) to 7.2% (n = 54); p<0.0001. The 30-day postdischarge mortality reduced from 19.4% (n = 123) to 10.2% (n = 76); p<0.0001. The reductions in mortality and length of stay remained significant after adjustment for demographic and risk factor variables.

Conclusion: The development of a modern and comprehensive consultant cardiologist-led service directed towards the early recognition and appropriate management of patients admitted with ACS is associated with impressive reductions in all-cause mortality. This improvement in outcomes occurred with an equally impressive reduction in hospital length of stay.

055 THE USE OF TELEMEDICINE FOR ECG INTERPRETATION IN PRIMARY CARE

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Telemedicine is increasingly used in clinical practice. Broomwell Healthwatch Telemedicine centre was established in 2004 to provide 24-h ECG interpretation, analysis and advice. The centre is staffed by experienced senior cardiac nurses and doctors. Clinical governance and risk management were both involved in this service evaluation and appraisal.

Aim: To review the ECG interpretation service over the past 4 years and assess the outcome and advice provided to all referrals made.

Methods: A total of 24 541, 12-lead ECG and 805, one-lead ECG received from general practitioner (GP) surgeries between October 2004 and October 2008 was analysed. All ECG were reviewed by two senior cardiac nurses and either a cardiology registrar or a consultant cardiologist. The recommended plans are either: GP assessment, cardiology referral, or emergency department referral.

An audit was conducted by Greater Manchester and Cheshire Cardiac and Stroke Network in 29 GP practices, on ECG received between November 2006 and November 2007, to document the level of satisfaction and the number of avoided referrals to secondary care with using this service.
Results: Out of the 24 541 12-lead ECG, 15 698 patients were symptomatic. The recommended plans of action were GP assessment: 87.5%, cardiology referral: 6.5%, and emergency department referral: 6%. In the 8843 asymptomatic cases, GP assessment was recommended in 96.3%. The one-lead ECG was performed in 805 cases, GP assessment was advised in 96% of symptomatic patients and 99% of asymptomatic patients. In the satisfaction audit, 60% of the forms were returned (20 practices). Of the 29 GP practices, 17 had their ECG previously reported by their local NHS Trust, which resulted in significant delay in receiving the reports of 1–60 days. With the adoption of the telemedicine service, all ECG were reported within 2 h of their receipt. Satisfaction level questionnaires were filled by 20 GP practices. All were either ''very satisfied'' or ''satisfied'' with the service (including the accuracy and speed of ECG interpretation). Secondary care referrals were prevented in up to 65.8% of the total cases (95% CI 61.6% to 65.8%). The extrapolated gross savings derived was in excess of £300 000.
Conclusions: Telemedicine and wireless ECG interpretation can enhance the practice by extending the medical consultation from GP practices to a specialist ECG centre. This can ultimately broaden the overall standard of patient care and potentially save time and money.

056 DECISION MAKING BETWEEN NURSES AND PARAMEDICS IN REPERFUSION OF ST ELEVATION MYOCARDIAL INFARCTION

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Introduction: To describe a reperfusion programme in ST elevation myocardial infarction (STEMI) based around prehospital decision-making between coronary care unit (CCU) nurses and ambulance paramedics.
Methods: Experience began in 2004 with nurses and paramedics discussing 12-lead electrocardiograms (ECG) transmitted from the ambulance to the CCU. This programme involved CCU nurses providing support to paramedics considering prehospital thrombolysis (PHT). The programme evolved in 2006 to include primary percutaneous coronary intervention (PCI). Based on a 90-minute diagnosis-to-PCI balloon time, nurses and paramedics now make a joint decision on whether patients with STEMI should recieve either PHT or primary PCI, based on clinical history, ECG findings, travel time from hospital and availability of PCI facilities.
Results: Between 1 December 2006 and 31 August 2008 primary PCI was the treatment for 70% of patients (526/751), with PHT administered to 1.5% (11/751) and inhospital thrombolysis to 5.9% (44/751). The mean length of hospital stay was 3.5 days for primary PCI patients and 5.9 days for all comers. Although non-randomised data, inhospital and 30-day mortality are significantly reduced in the primary PCI group at 3.2% and 4.7%, respectively. The 90-minute diagnosis-to-PCI balloon inflation was achieved in 64% of primary PCI cases (77% in in-hours cases and 45% out-of-hours). The median door-to-PCI balloon time was 53 minutes. No reperfusion therapy was administered to 14.2% of patients (107/751) with a discharge diagnosis of STEMI over the 21 months of the optimal reperfusion programme. This compares favourably with 141/487 (29%) in the first 12 months of the PHT programme, 89/438 (20%) in the second 12 months of the PHT programme and with the GRACE registry, which reported sustained rates of no-reperfusion in up to 29% of patients with STEMI. The on-call team were called for primary PCI on three occasions in which the patient did not undergo primary PCI. All three of these patients had widespread coronary disease with no occlusive thrombus. None had normal coronary arteries.
Conclusions: Using prehospital 12-lead ECG transmission, CCU nurses and ambulance paramedics can safely and effectively decide on the most appropriate reperfusion therapy for patients with STEMI. There are no other reported data of nurses and paramedics operating in this way and despite the single-centre observational nature of the data, this system of care appears to have a positive predictive value worth further exploration.

057 6-MONTH HEALTH-RELATED QUALITY OF LIFE IN ST ELEVATION MYOCARDIAL INFARCTION PATIENTS FOLLOWING THROMBOLYSIS OR PRIMARY PERCUTANEOUS CORONARY INTERVENTION

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Introduction: Difficulty with psychological adjustment post ST elevation myocardial infarction (STEMI) has been reported in as many as 40% of patients. The process of rehabilitation, recovery and the time taken to return to work can be adversely affected. Treatment such as primary percutaneous coronary intervention (PPCI) or thrombolysis (lysis), can also influence post-STEMI rehabilitation and recovery. At present few published data are available evaluating the health-related quality of life (HR-QoL) for lysis and PPCI patients. The purpose of this cohort study is to ascertain predictors of physical health status in STEMI patients receiving lysis or PPCI for future service provision and adaptations.
Methods: A total of 430 STEMI patients will be recruited (200 lysis and 230 PPCI) across the Manchester conurbation; the study is in the recruitment phase at present. Four self-report questionnaires including the ENRICHD social support instrument (ESSI), the hospital anxiety and depression scale (HADS), the medical outcomes study Short Form 36 (SF-36) and the brief illness perception questionnaire will be collected at baseline, 6 and 12 months. Further data including demographics, relevant medical history and index treatment details are also recorded.
Results: Six-month interim data are available for 179 patients (94 lysis and 85 PPCI). Participant demographics are: lysis group 80% male, mean age 61 years (38–90; SD 12.5) and PPCI group 72% male, mean age 60 years (37–83; SD 11.2). Baseline data analysis showed no differences on the ESSI, HADS and aspects of the SF-36 between the two groups. Physical component scores of the SF-36, 6-month data were analysed using regression analyses and showed baseline levels of anxiety, depression, education level and several quality of life indicators significantly predicted physical components of HR-QoL.
Conclusions/Implications: Analyses for interim data show no significant difference between treatment groups on a range of psychosocial variables at baseline. However, patients' own self-rating of their physical HR-QoL at 6 months was predicted by quality of life and levels of psychological distress measured at baseline. The findings show that a subgroup of patients post-STEMI may benefit from targeted psychosocial interventions in order to maintain their quality of life and aid recovery over time.

058 A QUALITATIVE STUDY OF THE EXPERIENCES OF MYOCARDIAL INFARCTION PATIENTS WHO REPRESENT POST-PRIMARY PERCUTANEOUS CORONARY INTERVENTION

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Introduction: The current gold standard treatment for ST elevation myocardial infarction (STEMI) is primary percutaneous