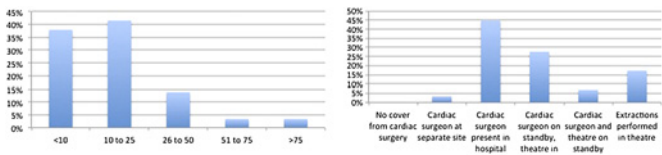


Abstract 060 Figure 1 (A) Number of extractions performed per annum. (B) Surgical cover.



Abstract 060 Figure 2

complexity. The risk of minor complications was perceived to be 4% or less by the majority of respondents across the device range. The same measure for major complications and death was 2% and 1% respectively.

**Conclusions and Implications** Transvenous lead extraction is becoming increasingly common and most UK operators who responded to our survey perform 25 cases or fewer per annum. Surgical stand-by support was mostly informal but a significant minority of cases were performed in an operating theatre with a surgeon present. The perceived risk of the procedure was broadly in line with widely published figures internationally. The 2009 Heart Rhythm Society consensus document made a series of recommendations with regards to training, case volume and stand-by surgical support. It is suggested that a minimum of 20 cases per year be performed by each operator and that a cardiothoracic surgeon be physically on site and capable of performing an emergent procedure promptly. Accordingly, increased operator caseload and closer links between EP extractors and surgeons should be seen as achievable goals.

## 061 QT PROLONGATION ASSOCIATES WITH INCREASED MORTALITY IN PATIENTS WITH RHEUMATOID ARTHRITIS

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**Background** Rheumatoid arthritis (RA) has been linked with increased cardiovascular morbidity and sudden cardiac death (SCD). A mechanistic link between prolonged QTc and increased risk of fatal arrhythmogenesis is well established. In the general population, there is no consistent evidence for increased risks of total or cardiovascular mortality or SCD in patients with modest prolongation of the QTc interval. The present study examines the presence of an association between prolonged QTc and mortality in RA patients.

**Methods** A cohort of 377 RA patients with detailed clinical and biochemical characterisation and baseline ECGs was followed-up prospectively. The QT interval lengths were corrected for heart rate using Bazett's Formula. The association of QTc with total mortality was assessed using Cox proportional hazards regression analysis. Patients with atrial fibrillation, flutter or bundle branch block were excluded from the analysis. There were no patients on QT prolonging medications.

**Results** The mean age of the study population was  $61.2 \pm 12.1$  years, 276 (73.2%) were females, the mean QTc was  $427.3 \pm 24.4$  ms and the mean QRS  $91.9 \pm 23.8$  ms. Of the 377 patients a total of 50 (13.3%) died during the follow-up period ( $63.5 \pm 15.7$  months or 1994 person-years). Survival analysis revealed a crude HR of 1.20 (95% CI 1.07 to 1.33,  $p=0.002$ ) per 10 ms increase in QTc. When adjusting for age, gender, smoking status, BMI, presence of hypertension, dyslipidaemia or insulin resistance HR per 10 ms increase in QTc remained significantly associated with total mortality 1.12 (95% CI 1.002 to 1.25,  $p=0.045$ ). After adjustment for QRS and presence of LVH the HR was 1.17 (95% CI 1.01 to 1.34,  $p=0.035$ ). Further adjustment for disease severity specific parameters including steroid exposure, anti-RF, anti-CCP antibodies and CRP did not alter the above association. ROC curve analysis determined a QTc cut-off for increased mortality at 426.5 ms (AUC 0.634,  $p=0.002$ ). The crude HR for overall mortality for RA patients at the prolonged QTc group ( $\geq 426.5$  ms), was 2.65 (95% CI 1.45 to 4.85,  $p=0.002$ ).

**Conclusions** Prolongation of QTc associates with an increased risk of death in patients with RA. This association remains significant after adjustment for established cardiovascular risk factors and markers of disease severity.

## 062 RE-APPRAISAL OF ECG INTERPRETATION IN YOUNG ATHLETES: SHOULD AXIS DEVIATION AND VOLTAGE CRITERION FOR ATRIAL ENLARGEMENT BE CATEGORISED AS ABNORMAL IN ATHLETES? THE BRITISH EXPERIENCE

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**Purpose** The European Society of Cardiology (ESC) guidelines for ECG interpretation in athletes facilitate the differentiation of physiological changes (Group 1) representing cardiac adaptation from those potentially associated with an increased cardiovascular risk (Group 2). Increased false positive rates remain the downside of electrocardiographic evaluation in athletes. The aim of this study was to assess whether axis deviation and atrial enlargement in isolation require further investigation in highly trained athletes.

**Methods** Between 2003 and 2011, 1843 highly trained athletes (66% males) (mean age  $20.7 \pm 6.0$  years); range 14–35 years, underwent cardiac evaluation with 12-lead ECG and echocardiography. ECGs were analysed for training-unrelated changes, according to the ESC guidelines.

**Results** Of the 1843 athletes, 1309 athletes (71%) demonstrated training related (Group 1) changes and 184 athletes (10%) exhibited training-unrelated (Group 2) changes. Of the Group 2 ECG changes, atrial enlargement and axis deviation in isolation were identified in 7.2% of athletes. Athletes with atrial enlargement or axis deviation did not exhibit significant difference in left ventricular end-diastolic cavity size  $>54$  mm (35.6% vs 27.9%  $p=0.1005$ ), mean right atrial dimension ( $41.4 \text{ mm} \pm 5.6 \text{ mm}$  vs  $42.0 \text{ mm} \pm 26.4 \text{ mm}$ ;  $p=0.848$ ) or fractional shortening (2.5% vs 3.8%;  $p=0.7881$ ) compared with athletes with Group 1 changes. The mean left atrial dimension in athletes with atrial enlargement/axis deviation was greater than in athletes with Group 1 changes ( $35.6 \text{ mm} \pm 5.58 \text{ mm}$  vs  $33.4 \text{ mm} \pm 5.26 \text{ mm}$ ;  $p<0.0001$ ). Athletes with atrial enlargement and axis deviation revealed a higher prevalence of left ventricular hypertrophy (LVWT  $>12$  mm) (8.5% vs 3.1%;  $p=0.0209$ ), right ventricular enlargement (RVID1  $>42$  mm) (38.9% vs 29.4%;  $p=0.0412$ ) compared with athletes with Group 1 changes. None of the athletes with axis deviation/atrial enlargement exhibited valve disease, or any features of hypertrophic cardiomyopathy or arrhythmogenic right ventricular cardiomyopathy.

**Conclusion** Atrial enlargement and axis deviation are relatively common in highly trained athletes. Subsequent investigation with echocardiography reveals slightly greater dimensions but has a low