

diagnostic yield for cardiac disease. Exclusion of these ECG parameters from the Group 2 category in asymptomatic athletes would reduce the false positive rate from 10% to an acceptable <3%.

**063** **SEX AND ETHNICITY SPECIFIC ECG DIFFERENCES IN ELITE ATHLETES: RELEVANCE TO PRE-PARTICIPATION CARDIOVASCULAR EVALUATION: THE BRITISH EXPERIENCE**

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**Purpose** The athlete's ECG is affected by several demographic factors but there is a paucity of data relating to the impact of the athlete's sex and ethnicity. The ESC guidelines for ECG interpretation in athletes are derived predominantly from male cohorts. Extrapolating such criteria to athletes of African/afro-Caribbean origin and female athletes may lead to erroneous interpretation.

**Methods** Between 2001 and 2011, 1378 highly trained athletes (55% males, 81% Caucasian) (mean age  $21.6 \pm 5.43$  years); range 14–35 years, underwent cardiac evaluation including 12-ECG and echocardiography. ECGs were analysed for training related (group 1) and training-unrelated (group 2) changes, according to the ESC guidelines.

**Results** Males demonstrated a higher prevalence of Group 1 (89% vs 61%;  $p < 0.0001$ ) and Group 2 ECG changes (26% vs 16%;  $p = 0.0001$ ) compared with females. Of the group 1 changes, isolated left ventricular hypertrophy (42%), early repolarisation patterns (ST elevation  $> 0.1$  mV) (61%), first-degree AV block (10%) were more prevalent in males compared to 14%, 45% and 4.7% females respectively ( $p = 0.0001$ ). Of the group 2 changes, T-wave inversion in leads V1-V4 were more prevalent in female athletes (12%) particularly black females (17%) compared to male athletes (4%;  $p = 0.0001$ ), whereas, T-wave inversion in the inferior leads were more common in males (3.3% vs 0.6%) irrespective of ethnicity. Males demonstrated a higher prevalence of axis deviation (6.7% vs 2.1%;  $p = 0.0001$ ), atrial enlargement (4.2% vs 1.0%;  $p = 0.0002$ ) and right ventricular hypertrophy (RVH) (8.3% vs 2.6%;  $p = 0.0001$ ) compared with females. Caucasian athletes exhibited greater group 1 changes compared with black athletes (73% vs 65%;  $p = 0.0161$ ). Black athletes exhibited a higher prevalence of group 2 ECG changes compared with Caucasian athletes (34% vs 21%;  $p < 0.0001$ ) with 15% of black athletes exhibiting T-wave inversion, 4.5% left atrial enlargement 14% right atrial enlargement and 12% demonstrating RVH compared to 9%, 0.9%, 0.09% and 4.1% of Caucasian athletes respectively. There was no correlation between any ECG parameter and cardiac chamber size.

**Conclusions** Male sex and black ethnicity equated to a higher prevalence of Group 1 and 2 ECG changes compared with female sex and Caucasian ethnicity. However, anterior T wave inversion was significantly more common in females, being present in over 10% of athletes irrespective of ethnicity than previously reported. The precise incidence and significance of anterior T-wave inversion in female athletes requires further assessment.

**064** **PREVALENCE AND MORPHOLOGICAL CHARACTERISATION OF EARLY REPOLARISATION PATTERNS IN YOUNG HEALTHY INDIVIDUALS: IMPACT OF GENDER, ETHNICITY AND PHYSICAL ACTIVITY**

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**Introduction** Early repolarisation (ER) is commonly observed in athletes and young healthy individuals. Recently, ER in the inferior

and lateral leads has been associated with sudden cardiac arrest from idiopathic ventricular fibrillation. We studied the prevalence, distribution and morphology of ER patterns in inferior and lateral leads in young healthy individuals.

**Methods** 12-leads ECG was performed at rest in 1237 young healthy individuals (age range 13–38 years) between February 2011 and September 2011. We evaluated the impact of gender, ethnicity and physical activity on ER. Individuals were divided into physically-active (exercise  $> 2$  h/week) and sedentary. Early repolarisation was defined as notched or slurred J-point elevation of at least 0.1 mV from baseline, in  $\geq 2$  contiguous inferior or lateral leads; anterior ER patterns were not considered in this study. The morphology of ST-segment was classified as horizontal/descending or rapidly ascending/up sloping.

**Results** The mean age of participants was  $18.2 \pm 4.3$  years, of which 979 (79%) were male, 981 (79%) were physically active and 91% were Caucasians. ER pattern was present in a total of 232 (18.7%) cases; of these 42% were in the inferior leads, 31% in lateral leads and 27% in both. Notched ER was more prevalent (64% inferior, 83% lateral, 76% infero-lateral) compared to slurred morphology, and more commonly associated with ascending/upsloping ST-segment elevation. ER was significantly more prevalent in males compared to females (20% vs 12%,  $p = 0.003$ ), in physically-active people compared to sedentary (20% vs 13%,  $p = 0.0194$ ), and in Afro-Caribbeans compared to Caucasians (40% vs 17%,  $p = 0.0013$ ). In addition, voltage criteria for left ventricular hypertrophy and sinus bradycardia were a common associated finding in individuals with ER pattern compared with those without ( $p = 0.0001$  and  $0.002$  respectively). Only 5% of individuals with ER had J-point elevation of  $> 0.2$  mV.

**Conclusion** Early repolarisation is a common finding in young healthy individuals, and is more prevalent in males, physically-active individuals and those with Afro-Caribbean ethnicity. Notched ER with ascending ST-segment elevation in inferior leads was the most commonly observed morphological pattern. More research is required to understand precise long-term implications of such repolarisation changes in young individuals.

**065** **ATRIAL FIBRILLATION ABLATION IN A DISTRICT GENERAL HOSPITAL: 3 YEARS EXPERIENCE**

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**Introduction** The practice of atrial fibrillation (AF) ablation is increasing exponentially. At present, these procedures are performed in a small number of surgical tertiary centres. In order to meet the growing demand it will be necessary to expand this service. We sought to assess patient satisfaction, procedural success and complication rates for AF ablation performed via a newly established district general hospital (DGH) service.

**Methods** We prospectively surveyed patients undergoing AF ablation, between November 2007 and November 2010, at Eastbourne DGH. Patient symptoms were assessed before and at least 12 months after AF ablation by telephone questionnaire, procedural satisfaction was also assessed. Procedural details (procedural time, fluoroscopy time, ablation technique) and complications were all accurately recorded for every case.

**Results** In 278 patients 314 procedures (average 1.13 procedures/pt) were performed (160 for persistent AF [PersAF], 134 for paroxysmal AF [PAF]). Mean age  $63.8 \pm 10.7$  years, 70% male. Of the PAF cases 75 procedures were performed with the PVAC (Medtronic, USA) and 56 with the Mesh (Bard, USA) catheter. The remaining three