Electrocardiographic characteristics of West-Asian and African Male athletes: the Qatari pre-participation screening experience

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Background: Electrocardiographic (ECG) alterations are common in athletes and usually reflect a physiologically benign remodelling of the heart as a response to regular intensive exercise, so called "athletes heart". However, some features observed in an athlete's ECG may represent an underlying inherited or congenital cardiovascular abnormality, potentially propagating sudden cardiac death (SCD).

Purpose: To evaluate the electrocardiographic characteristics of West-Asian, Black and Caucasian male athletes competing in Qatar.

Methods: Cardiovascular screening with resting electrocardiographic analysis of 1220 national-level athletes (800 West-Asian, 300 Black and 120 Caucasian) and 135 West-Asian controls attending pre-participation screening was performed. Results: Black African descent was an independent predictor of 'uncommon' ECG changes compared to West-Asian (OR 2.56, 95% CI 1.73-3.8, p<0.001) and Caucasian athletes (OR 3.5, 95% CI 1.56-8.02, p<0.001). Black athletes demonstrated a significantly greater prevalence of lateral T wave inversions than both West-Asian and Caucasian athletes (6.1% vs. 1.6% and 0%, p<0.05). Black athletes also demonstrated a greater frequency (p<0.05) of right atrial enlargement, 1st degree AV block and early repolarisation than West-Asian and Caucasian athletes. Seven athletes were identified with a disease associated with sudden death; with prevalence of cardiac disease was 2 times higher in Black athletes than West-Asian athletes (1% vs. 0.5%) - no cases verified in Caucasian athletes and West-Asian controls. Eighteen West-Asian and Black athletes were also identified with striking repolarisation abnormalities suggestive of a cardiomyopathy, ultimately, none were diagnosed with an inherited cardiac disease.

Conclusions: West-Asian and Caucasian athletes demonstrate comparable rates of common and uncommon ECG modifications. Only Black ethnicity was positively associated with frequencies of 'uncommon' ECG alterations. Despite the greater number of false positive ECGs in Black athletes, the cost-benefit ratio of the preparticipation is favourable for this population due to its greater predictive value for identifying sudden death diseases.