Electrocardiographic abnormalities in a young male Southeast Asian population undergoing pre-participation cardiovascular screening: Results of the SAFE study

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Background

Although the inclusion of routine electrocardiograms (ECG) in preparticipation cardiovascular screening remains controversial, there is increasing evidence that cardiomyopathies, arrhythmogenic and ion channel disorders have ECG changes as the initial presentation. We aim to determine the prevalence and spectrum of ECG abnormalities in a young male Southeast Asian population.

Methods

The Singapore Armed Forces Electrocardiography and Echocardiography (SAFE) protocol is an ECG-based preparticipation screening programme modelled after the Italian system. From October 2008 to May 2009, a total of 18,476 young male conscripts [mean age 19.5, Range 16-27] underwent mandatory pre-enlistment medical screening at a single medical facility.

Subjects with abnormal ECG findings were classified into 2 groups: Group A had ECG changes that fulfilled a pre-specified checklist to screen for Hypertrophic Cardiomyopathy were fast-tracked for transthoracic echocardiogram (TTE) at a single cardiology unit; Group B had other ECG abnormalities (such as Brugada sign, WPW pattern, Long QTc) and were referred for secondary screening at a tertiary institution.

The checklist for an abnormal ECG finding is described below. Those with other ECG abnormalities such as T wave inversions in more than two leads, ST segment depression, P wave abnormalities, significant heart block, prolonged QTc ≥ 440ms calculated using Bazett’s formula, Wolff-Parkinson-White pattern or Brugada sign (Group B) will be separately referred for secondary screening by cardiologists in public institutions via a different clinical pathway.

Results

ECG abnormalities were noted in 7.0% (n = 1285) of the subjects. Of note, 19(0.10%) had Brugada sign, 25(0.14%) had WPW pattern, and 30(0.17%) had prolonged QT interval on ECG. As part of the workup, 94.6%(n=1203) of the subjects underwent TTE, and 7.5%(n=90) of them had abnormal TTE findings.

Conclusions

The prevalence of ECG abnormalities in a young, South-East Asian male population [mean age 19.5, Range 16-27] is 7.0%. The inclusion of universal ECG, in addition to history and physical examination, may increase the sensitivity of a cardiovascular screening programme. Knowledge of the spectrum and prevalence of ECG abnormalities and disease conditions would be pivotal in designing customised screening programmes.

Declaration of Interest: The authors declare that there is no conflict of interest