TACSM Abstract

Red Flags in Family History and Auscultations that may Require 12-Lead ECG when Screening Athletes

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ABSTRACT

The main components of pre-participation physical exams (PPE) at the NCAA Division II level include a thorough medical history and physical evaluation (AHA). "Red flags" for risk on the PPE and medical history include, but are not limited to, heart murmur, diagnosed enlarged heart in a family member, unexplained chest pain, and complaints of "skipped" heartbeats. The purpose of this investigation was to determine if the use of 12-lead ECG for the PPE would reveal further red flags specific to cardiac abnormalities. Twelve-lead electrocardiogram (ECG) was performed on all new athletes at Tarleton State University during the Summer and Fall 2012 (N=200). Twelve-lead ECGs were reviewed and analyzed by the lab director and attending physician. Upon completion of the PPE, medical history, and ECG, five athletes needed follow-up based on PPE and 12-lead ECG. Reasons for initial concern were the previously stated "red flags" as well as abnormal ECG readings. The abnormal ECG readings included left ventricular hypertrophy (LVH), incomplete right bundle branch block (IRBBB), sinus arrhythmia, and right atrial enlargement (RAE). LVH, IRBB, and sinus arrhythmia were all found to be normal training induced adaptations, however RAE is a non-training induced cardiac abnormality. Of those five, all of them had some type of cardiac adaptation, but one of them presented with RAE. The athlete was an 18-year old male, 64.5" tall, 116 pounds, and in his first year of collegiate cross-country athletics. His HR was 81bpm and blood pressure was 122/72 mmHg. His grandmother was diagnosed with an enlarged heart. The clearing physician, an orthopedic doctor, found only training induced abnormalities in all five athletes. All five athletes were cleared for competition.

Endurance athletes often have abnormal ECG readings as a result of training induced abnormalities. In the present investigation, an athlete with RAE competed for an entire cross-country season without any issues or complaints. Physicians trained in reading ECGs should be responsible for clearing athletes for participation. In this case, right atrial enlargement appeared in the ECG, yet the orthopedic doctor did not request follow up tests. Physicians who are versed in exercise training induced changes that might be classified as normal or abnormal should be the final step in clearing athletes for competition.