TACSM Abstract

Pilot Study for Using ECG in Pre-participation Physical Exams in Collegiate Athletes

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ABSTRACT

Background and Purpose: Disagreement exists in the sports medicine field concerning the best way to recognize and prevent unexpected deaths in sports. The purpose of this pilot study was to determine the extent to which using 12-lead ECG in pre-participation physical exams (PPE) meet diagnostic criteria for sudden cardiac death. **Methods**: Twenty-seven (*N* = 27) Division II athletes ages 18 to 24 were screened for ECG abnormalities during routine PPE. All subjects were required to go through a detailed medical and health history as a requirement of participation in NCAA athletic activity. This included a 29 item sign, symptom, and injury history list; vision screening; dental exam; and a general medical and musculoskeletal exam. Height, weight, supine 12-lead ECG (HP, QRS Card Suite® and Welch Allyn, CardioPerfect®) and supine blood pressures were measured using a standard sphygmomanometer and stethoscope. Each subject rested in a supine position for two minutes after which a blood pressure and average resting 12-lead ECG was recorded. Results are reported as means ± SD. **Results**: Descriptive results for males and females are presented in the attached table. Two male football athletes had diastolic blood pressures equal to 90 mmHg. One male football athlete (168 kg) had a borderline ECG marked by RSR′ pattern in V1, Lead III, and avF. This athlete also had a family history of hypertrophic cardiomyopathy. None of the other athletes screened met ECG criteria for needing further cardiac workup as described by Lawless and Best (2008).

Variable	Males (N = 20)	Females (N = 7)
Age	20.7 ± 1.8	19.4 ± 1.4
Weight (kg)	92.9 ± 26.0	77.1 ± 23.3
BMI (kg/m^2)	28.7 ± 6.6	27.6 ± 6.7
Resting HR (bpm)	70.8 ± 11.2	72.4 ± 8.2
Resting SBP (mmHg)	122.3 ± 7.5	117.0 ± 11.3
Resting DBP (mmHg)	66.8 ± 15.6	65.0 ± 12.3
Resting RPP (mmHg·bpm^{-2})	86.5 ± 15.8	84.7 ± 13.1
PR interval (msec)	162.5 ± 20.3	143.6 ± 13.6
QRS interval (msec)	98.6 ± 11.2	93.1 ± 15.1
QT interval (msec)	382.9 ± 27.9	352.4 ± 123.5
Axis (°)	70.6 ± 26.9	61.3 ± 36.9

Conclusion: The goal for the future is to continue to use ECG in PPE as well as to follow this pilot group in the future to identify and match cardiac events to appropriate screening tools.