

Cardiac Rhythm Management

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THE 12-LEAD ELECTROCARDIOGRAM OF THE ELITE RUGBY FOOTBALL LEAGUE PLAYER

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Introduction Specific ECG criteria have been proposed to differentiate physiology (athlete's heart) from pathology that may increase the risk of sudden cardiac death. Although the current European Society of Cardiology (ESC) guidelines have clear criteria for physiological adaptation to intense training, their sensitivity and specificity are sub-optimal and hence the more recent Seattle and Refined criteria have attempted to improve diagnostic accuracy of the athlete's ECG.

Rugby Football League (RFL) is a moderate dynamic and moderate static sport with recent high profile fatalities linked to inherited cardiomyopathy. This study utilises resting 12-lead ECG, in elite RFL players to compare 3 sets of diagnostic ECG criteria in the athlete and specifically false positive rates.

Methods 103 consecutive, male, elite RFL players (mean age 25-4 years) underwent pre-participation cardiac screening. Participants were predominantly white Caucasian (n = 81) with a minority of ethnic backgrounds being represented (Pacific Islander, n = 16; mixed race, n = 5; African-Caribbean, n = 1). All athletes had resting blood pressure assessed and a standard resting 12-lead ECG. In addition *all* athletes had a standard transthoracic echocardiogram and where indicated further investigations were undertaken. Standard ECG parameters were measured and the ESC recommendations for interpretation of 12-lead ECG in the athlete were used to define normal training (Group 1) and abnormal (Group 2) changes. All ECG's were also assessed for normality using the Seattle and Refined criteria. False-positive rates were presented for each ECG criteria.

Results Based on ECG, echocardiography and/or follow-up investigation all athletes were considered normal with no evidence of underlying cardiac disease. The continuous ECG

Abstract 121 Table 2 % Training unrelated ECG changes for ESC, Seattle and Refined Criteria (% False Positive Rate)

ECG Abnormality	False Positive Rate (%)		
	ESC Criteria	Seattle Criteria	Refined Criteria
Long QTc Interval	1	0	0
Short QTc Interval	44	0	Not Relevant
Intraventricular conduction delay (IVCD)	5	0	1
Right atrial enlargement (RAE)	1	0	1
Right ventricular hypertrophy (RVH)	3	0	3
Right axis deviation (RAD)	1	0	1
Left axis deviation (LAD)	3	3	3
T wave Inversion	1	1	1
≥2 PVCs per 10s tracing	Not Relevant	1	1
False Positive Rate according to Criteria	58	5	3

measurements are shown in Table 1. According to ESC criteria 95% of athletes had at least one group 1 "normal training-related" ECG change. 58% of athletes had at least one Group 2 "abnormal training-related" change. This is therefore a false positive rate of 58%. Following application of the revised Seattle and Refined criteria the false-positive rates reduced to 5% and 3% respectively (Table 2).

Conclusion A significant proportion of RFL players present with an abnormal, non-training related, 12-lead ECG according to ESC criteria. In the cardiac screening setting this would result in significant extra cardiac investigation burden. Application of the Seattle and refined criteria decreased the false-positive rate and hence improves ECG specificity in this population.

Imaging

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INTRODUCTION OF STRESS ONLY MYOCARDIAL PERFUSION SCINTIGRAPHY: A QUALITY IMPROVEMENT PROGRAMME

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Abstract 121 Table 1 Continuous ECG variables of 103 elite RFL players

Continuous ECG variables	Mean ± SD(Range)
Heart Rate (bpm)	54 ± 9 (39-89)
P Duration (ms)	105 ± 16 (58-176)
PR Interval (ms)	174 ± 26 (129-309)
QRS Duration (ms)	95 ± 12 (11-123)
QT Corrected (ms) (Bazett)	381 ± 20 (338-442)
QRS Axis (degrees)	61 ± 32 (-46-117)

Introduction Myocardial perfusion scintigraphy (MPS) is one of the most commonly performed non-invasive imaging procedures for the diagnosis of Coronary Artery Disease (CAD). Two large trials evaluating over 21,000 patients with a normal SPECT study have demonstrated the safety of stress-only imaging as compared to traditional stress/rest imaging. Comparably low all-cause and cardiac mortality rates were observed with both imaging protocols. This was true irrespective of patient age, gender, cardiac risk factor profile, or stressor employed with SPECT. These results are consistent with earlier studies evaluating patient outcome following normal stress-only imaging. The best use of a stress-only imaging strategy is likely to be in the selected low or intermediate risk population, which forms the referral basis for myocardial perfusion imaging. In this study, we describe the introduction of stress only MPS in comparison to traditional stress/rest MPS.