CORRESPONDENCE

The Pre-Participation Examination for Leisure Time Physical Activity: General Medical and Cardiological Issues

by Prof. Dr. med. Herbert Löllgen, Prof. Dr. med. Dr. Sportwiss. Dieter Leyk, Dr. med. Jochen Hansel in volume 42/2010

Electrocardiogram in Athletes

Changes in the resting electrocardiogram (ECG) as a result of training are common and can cause difficulties for the differential diagnosis. Recently updated guidelines from the European Society of Cardiology (ESC) differentiate between common, training-related and rare, potentially pathological changes (1). These new international recommendations were omitted from the article on the pre-participation examination for leisure time physical activity (2), presumably because they were not yet available at the time the manuscript was accepted. I wish to add them at this point.

The following changes on ECG are classed as training-related in the absence of other distinctive features: sinus bradycardia, 1st degree atrioventricular block, incomplete right bundle block, early repolarization, isolated increased QRS voltages (increased Sokolow-Lyon index). These changes may occur in up to 80% of athletes. The prevalence is highest in endurance athletes with physiological remodeling of the heart, but the changes may also be found in other athletes and are notably more common in men than in women, and in black people than in white (Caucasian) people (3, 4).

Isolated increased QRS voltages are responsible for 60% of training-related changes in athletes (4). In addition to cardiac adaptations, athletes often have favorable conditions for ECG leads owing to a lower proportion of body fat. Early repolarization of at least 0.1 mV, mostly located in the precordial leads (V2)V3–V4, is also common. In athletes of Afro-Caribbean origin, these ST elevations may be followed by negative T waves (3). As far as AV blocks are concerned, I would, by contrast to the authors, be very reticent to classify a 3rd degree AV block in elite athletes as normal (*Box 3*). I am not familiar with any such findings in athletes who are proven to be healthy.

It is to be expected that the current ESC recommendations will notably lower the rate of false positive findings on athletes' ECGs.

DOI: 10.3238/arztebl.2011.0010a

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In Reply:

The letter by Kindermann is an important and up to date addition. The relevant consensus paper was not available at the time our article went to press. This recommendation should be applied in any scenario to evaluate a resting ECG. We wish to point out that during the publication process, several other publications appeared on the subject of ion channel disorders and cardiomyopathies, especially right ventricular cardiomyopathies. As always in the case of such a publication, it is incumbent on readers to familiarize themselves with the recent literature.

Even total AV block in athletes always requires a thorough investigation.

It remains for me to add that shortly, a multicenter study will start in Germany in order to investigate conspicuous ECG findings in athletes. Important information on this subject are expected from this prospective study.

DOI: 10.3238/arztebl.2011.0010b

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Conflict of interest statement

The authors of both contributions declare that no conflict of interest exists according to the guidelines of the International Committee of Medical Journal Editors.