

The Importance of the Electrocardiogram (Ecg) in the Setting of Sports Pre-Participation Screening

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The regular practice of physical and sporting activities is one of the most important measures in cardiovascular prevention. It is to be recommended at all ages as it improves fitness and significantly reduces cardiovascular morbidity and mortality. However, exercise can become a trigger of Sudden Cardiac Death (SD) in patients with often, underlying cardiovascular disease. This seeming paradox regarding exercise explains how a young athlete in apparent good health can die unexpectedly whilst working out or during a sports competition. The mechanism of arrest rate during sport activity, consists, in the vast majority of cases, of a ventricular tachyarrhythmia arising as a sudden complication in a broad spectrum of cardiovascular diseases, from a silent clinical course and, therefore, difficult to suspect or diagnose. Thus, sudden death is often the singular manifestation of an underlying heart disease that is only revealed during autopsy. Systematic cardiovascular screening tests that individuals who wish to pursue sporting activities face, offer athletes with cardiovascular disease “at risk” the possibility of early identification, at pre-symptomatic stage. Despite the fact that the need to screen pre-competitive athletes is recognized by major international Medical-Sports Cardiology Associations including the American Heart Association (AHA), the European Society of Cardiology (ESC) and the International Olympic Committee, there is no definitive consensus on the optimal protocol to be adopted. The debate, which is still open, focuses on the usefulness of including the electrocardiogram 12-lead ECG at rest, family and personal anamnesis and objective physical exam in the cardiovascular baseline evaluation. For over half a century, The Electrocardiogram (ECG) of high-level athletes has been the subject of study by cardiologists and sports physicians. It often presents, in fact, modifications in rhythm and in the morphology of its waves due to the remodeling of the heart, both from a functional, morphologic and physical point of view. It was for this reason that the electrocardiogram was used in the past to monitor the physical shape of athletes. Such an approach is less common now since other cardiorespiratory and metabolic methods of functional evaluation have become available. Clearly, some of the changes attributed to training can also be found in untrained but, otherwise healthy individuals. In addition, it has become clear over the years that some heart diseases unknown to sports doctors non abreast of the times, may give rise to square electrocardiographic pictures which are sometimes difficult to differentiate from those observed in athletes with absolutely normal hearts. Apart from the problems posed by its reading, when concerning high-level athletes, the ECG is a simple and inexpensive method of investigation, used in diagnostic screening for heart disease (at risk of sudden death) in sportsmen and women. In 2005, the European Society of Cardiology [1] proposed entering ECG (at rest) as a routine examination in the medical check-up procedure of young athletes. This suggestion has recently been taken up by some American scholars [2-3], who have re-evaluated the importance of the ECG in sports pre-participation screening.

As demonstrated by Professor Domenico Corrado in an emblematic study [4], the ECG at rest is able to identify some heart diseases at an early stage in order to determine the risk of sudden death in athletes, with an extremely favourable cost/benefit ratio as it is very economic and because the ECG is an integral part of Italian athletic fitness tests for competition participation [5]. This is why being aware of and up to

date with electrocardiographic changes, characteristic of well-trained athletes' hearts and in the specific alterations in heart disease more frequently implicated in causing sudden death, necessarily have to be part of every sports physician's medical knowledge. Electrocardiograms carried out and interpreted correctly can save athletes' lives and be of socially economic benefit [6]. Therefore it would be desirable a greater interest by cardiologists and sports physicians to publishing interesting cases study on the sports pre-participation screening.

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