Endurance athletes: exploring the limits and beyond

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Humans have always tried to push back the limits imposed by their physical characteristics. Competitive sports are in themselves a continuous struggle to surpass these established limits. As physicians, we are frequently asked not only to identify and treat diseases, but to define what is and what is not healthy behaviour. The paper by Heidbüchel and co-workers poses a fundamental question to medical practitioners: what are the reasonable limits for the practice of sport?

The general population has the perception that athletes are the healthiest members of society, since they are capable of such impressive physical performance. However, the cardiological community has been interested in the inherent risk of sport for many years. Although it is proven that moderate exercise is helpful in controlling risk factors for coronary artery disease and in decreasing its incidence, several studies have shown that acute myocardial infarction may be precipitated by exercise. On the other hand, athlete’s heart is a well-known consequence of sport practice, and has been considered as a kind of physiological adaptation to extreme training. It was not until very recently that athlete’s heart (dilatation, hypertrophy and enhanced vagal tone) was recognized as a possible risk factor for the development of atrial fibrillation, establishing a link between excessive training and the presence of arrhythmias.

Up until now, sudden death in athletes has been attributed to underlying, pre-existing cardiovascular diseases such as hypertrophic cardiomyopathy or right ventricular dysplasia. In this issue of the journal, Heidbüchel and co-workers go a step further, and hypothesize that long-lasting, competitive endurance activities may, in some individuals, induce structural changes in the right ventricle. This can lead to a kind of 'acquired right ventricular dysplasia' that may finally produce ventricular arrhythmias and sudden death. Although the published paper does not prove this hypothesis, the high mortality observed in this series of patients is quite worrisome. As many as 59% of patients fulfilled the proposed criteria for ARVD. However, MRI was considered normal in 53% of patients and endocardial biopsy was also normal in 50% of patients in whom it was performed. The diagnosis of ARVD is always elusive, unless clearcut structural abnormalities are detected. Whether the patients in the series represent a form of ARVD or a new disease related to chronic endurance sport practice remains to be elucidated. In any case, we, as cardiologists, are faced with a new diagnostic difficulty: Besides advising these patients to give up sports activities, we will have to decide whether to implant a defibrillator in young, otherwise healthy patients, with a diagnosis based on suspicion more than on certainty. Biffi and co-workers have found that complex ventricular arrhythmias detected in Holter recordings of athletes do not pose a risk for sudden death. Furthermore, we may see patients with VPB and non-sustained ventricular tachycardias from the right ventricular outflow tract (RVOT). Idiopathic RVOT tachycardia is thought to be a benign condition with a very low risk for sudden death.

The profile of the patients described by Heidbüchel probably represent a highly selected group of athletes (the majority cyclists), that were symptomatic with syncope or pre-syncope, and exhibit episodes of non-sustained episodes of VT with high inducibility in the EP study. One would suppose that the high mortality observed in these series does not apply to asymptomatic athletes, who have less complex arrhythmias and are non-inducible to sustained VT in the EP study. New data suggesting that excessive endurance training may have deleterious consequences for the heart need to be confirmed by case-control studies of non-selected populations. Meanwhile, endurance athletes presenting with syncope or presyncope should be carefully...
evaluated to rule out potentially lethal ventricular arrhythmias.

References