An editorial note on differentiating athlete's heart and performance

Dejan Nesic

Citation: Nesic D. An editorial note on differentiating athlete's heart and performance. Clin Cardiol J 2021;5(6):1-1.

EDITORIAL

Physicians who are unfamiliar with the clinical aspects of athletic hearts are perplexed. The diagnosis of hypertrophic cardiomyopathy, in particular, may be recommended. The clinical indications of an athlete's heart are described in detail, with a focus on this problematic diagnosis. The outcomes of particular studies, such as the ECG and echocardiography, are emphasised. The physiologic adaptations seen in athletic hearts do not appear to pose any substantial difficulties. Long-term follow-up of the most extreme occurrences, on the other hand, is extremely restricted, and more research is needed in this area. Athletes often have resting bradycardia; however aberrant tachyarrhythmias during exercise indicate cardiac illness and are not part of the athlete heart syndrome. The changes in heart structure and function that occur as a result of physiological adaptation to exercise (so-called "Athlete's Heart") may coincide with some aspects of pathological diseases in athletes who engage in a high volume of high intensity exercise.

This chapter is focusing on the left side of the heart, in which expansion of the left ventricular cavity, increased left ventricular wall thickness, and enhanced left ventricular trabeculation associated with athletic remodelling can be difficult to distinguish from dilated cardiomyopathy, hypertrophic cardiomyopathy, or seperated left ventricular non-compaction. A proper diagnosis can have serious consequences, such as disqualification from competitive sport, or false reassurance and a missed opportunity for appropriate therapeutic intervention. The general public and athletic teams are increasingly able to access wearable performance gadgets and sensors. Individual endurance athletes, sports teams, and physicians can now track functional motions, workloads, and biometric indicators to improve performance and reduce injury thanks to technological advancements. Pedometers, accelerometers/gyroscopes, and global positioning satellite (GPS) devices are examples of movement sensors. Heart rate monitors, sleep monitors, temperature sensors, and integrated sensors are examples of physiological sensors.

The goal of this review is to educate health care professionals and team physicians with the many types of wearable sensors that are now available, describe their current use, and outline future possibilities in sports medicine. There is strong evidence that heart rate recovery (HRR) after exercise is a reliable measure of sympaticovagal equilibrium. It's also employed in sports training prescription and monitoring. The goal of our research was to measure HRR following maximal activity in elite athletes as a function of their age. On a treadmill, they completed maximal cardiopulmonary exercise testing. The rate of fall in HR from peak exercise to rates 1, 2, and 3 minutes after exercise cessation was calculated (HRR1, HRR2 and HRR3). HRR1 was found to be considerably higher in group A (29.5 ± 15.6 compared 22.4 ± 10.8, P<0.001), but HRR3 was found to be significantly higher in group Y (82.7 ± 10.2 *vs.* 79.9 ± 12.25; P=0.04). The HRR1 was independently linked with age (P<0.001) among all individuals, according to stepwise multivariate linear regression analysis.

In all athletes, the maximal oxygen consumption (VO2 max) had a negative association with HRR1 and a positive relationship with HRR3 (P=0.05). The HRR during the first 3 minutes after exercise should be reported in order to better assess functional adaptation to exercise in elite athletes as well as age-related changes in recovery. HRR1 levels could be predicted to be higher in older athletes, while HRR3 could be used as an indicator of aerobic capacity regardless of age. In adolescents and young adults with clinically silent cardiovascular diseases, competitive sports engagement is linked to an increased risk of sudden cardiovascular death (SCD).

While atherosclerotic coronary artery disease accounts for the vast majority of SCDs in middle-aged/senior athletes, the spectrum of substrates in young athletes is broader, including inherited (cardiomyopathies) and congenital (coronary artery abnormalities) structural heart illnesses. SCDs with an apparently normal heart at autopsy have been linked to inherited ion channel disorders. Screening with an ECG allows athletes with cardiac muscle diseases to be identified before they become symptomatic, potentially lowering the risk of SCD during sports. By lowering the amount of false positives, the implementation of contemporary criteria for ECG interpretation in athletes has the potential to increase screening accuracy. Exercise testing in middle aged/senior athletes participating in leisure sports activity is likely to be successful in patients with high coronary risk factors, but not in low-risk subgroups. The presence of an automated external defibrillator on the sporting field provides a "back-up" preventive strategy for arrhythmic cardiac arrest, which occurs most frequently in patients with coronary artery disease. Regular moderate exercise training can help prevent and treat a variety of chronic diseases, as well as improve cardiovascular health and lifespan.

Long-term excessive endurance activity, on the other hand,

Department of Medical Biotechnologies, Division of Cardiology, University of Siena, Italy

Correspondence: Dejan Nesic, Department of Medical Biotechnologies, Division of Cardiology, University of Siena, Italy, E-mail: Dejan.n@usi.it
Received: November 02, 2021, Accepted: November 07, 2021, Published: November 12, 2021

may result in abnormal structural remodelling of the heart. As typical physiological adaptations for prolonged and strong endurance physical stress, the athlete's heart is characterised by enlargement of cardiac chambers and eccentric hypertrophy with retained myocardial function. Recent research has shown that extreme endurance exercise can cause transitory right ventricular dysfunction and an increase in cardiac biomarkers. Patchy fibrosis of the right heart and interventricular septum may result from repeated bouts of acute stress, providing an arrhythmogenic substrate. The current medical literature on the effects of vigorous and extended endurance exercise on heart anatomy and function, as well as its clinical implications.