Brief Report
Volume 6:1, 2022

Journal of Interventional and General Cardiology

ISSN: 2684-4591

Open Access

The Difference between an Athlete's Heart and their Performance

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Brief Report

Physicians who aren't familiar with the clinical characteristics of sports heart disease are baffled. It's possible that a diagnosis of hypertrophic cardiomyopathy, in particular, may be suggested. The clinical signs and symptoms of an athlete's heart are detailed, with a focus on this troublesome diagnosis. The results of specific investigations, such as ECG and echocardiography, are highlighted [1]. The physiologic changes exhibited in athletes' hearts do not appear to cause any significant problems. On the other hand, long-term follow-up of the most extreme events is exceedingly limited, and additional research is needed in this area. Resting bradycardia is common in athletes, however abnormal tachyarrhythmias during exercise suggest cardiac disease and are not part of the athlete heart syndrome. Athletes who engage in a high volume of high intensity exercise may experience changes in heart shape and function as a result of physiological adaptation to exercise (so-called "Athlete's Heart").

The left side of the heart is the focus of this chapter, where 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 major repercussions, such as disqualification from competitive sports or false reassurance, as well as a missed opportunity for effective therapeutic intervention. Wearable performance gadgets and sensors are becoming more widely available to the general population and sporting teams. Thanks to technological improvements, individual endurance athletes, sports teams, and physicians can now track functional motions, workloads, and biometric indications to improve performance and decrease injury [2,3]. Movement sensors include pedometers, accelerometers/gyroscopes, and global positioning satellite (GPS) devices. Physiological sensors include heart rate monitors, sleep monitors, temperature sensors, and integrated sensors.

To familiarise health care professionals and team physicians with the many types of wearable sensors that are presently accessible, discuss their existing applications, and highlight future sports medicine prospects. Heart rate recovery (HRR) after exercise has been shown to be a valid indicator of sympaticovagal balance. It's also used in the prescription and monitoring of sports training. The purpose of our study was to determine HRR after maximal activity in elite athletes as a function of age [2]. They conducted maximal cardiopulmonary exercise testing on a treadmill. The maximal oxygen intake (VO2 max) demonstrated a negative connection with HRR1 and a positive relationship with HRR3 in all athletes (P=0.05). In order to properly assess functional adaptation to exercise in elite athletes as well as age-related variations in recovery, the HRR during the first 3 minutes after activity should be reported [3]. HRR1 levels in older athletes could be expected to be higher, however HRR3 could be utilised as a measure of aerobic capacity regardless of age.

Competitive sports participation is connected to an elevated risk of sudden cardiovascular death in adolescents and young people with clinically silent cardiovascular disease (SCD). While atherosclerotic coronary heart disease is responsible for the majority of SCDs in middle-aged/senior athletes, the spectrum of substrates in young athletes is larger, including inherited (cardiomyopathies) and congenital (coronary artery abnormalities) structural heart disorders. Inherited ion channel abnormalities have been associated to SCDs with an apparently normal heart at autopsy. Athletes with cardiac muscle problems can be diagnosed with an ECG screening before they become symptomatic, potentially minimising the risk of SCD during sports [4]. The use of modern criteria for ECG interpretation in athletes has the potential to improve screening accuracy by minimising the number of false positives.

Exercise testing in middle-aged/senior athletes engaged in recreational sports is likely to be beneficial in patients with high coronary risk factors, but not in low-risk subgroups. The inclusion of an automated external defibrillator on a sports field serves as a "back-up" preventive strategy for arrhythmic cardiac arrest, which is particularly common in patients with coronary artery disease. Moderate exercise training on a regular basis can help prevent and treat a range of chronic diseases, as well as enhance cardiovascular health and lengthen life expectancy. Excessive endurance activity over time, on the other hand, may result in aberrant cardiac structural remodelling. The athlete's heart is characterised by enlargement of cardiac chambers and eccentric hypertrophy with preserved myocardial function, as normal physiological adaptations for extended and intense endurance physical exertion [5]. Extreme endurance exercise has been linked to transient right ventricular dysfunction and an increase in cardiac biomarkers, according to new research. Repeated episodes of acute stress can cause patchy fibrosis of the right heart and interventricular septum, which can act as an arrhythmogenic substrate. The latest research on the impact of vigorous and prolonged endurance exercise on heart structure and function, as well as clinical consequences.

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How to cite this article: Nesic, Dejan. "The Difference between an Athlete's Heart and their Performance." J Interv Gen Cardiol 6 (2022): 144.

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Received 06 January, 2022, Manuscript No. jigc-22-52978; **Editor assigned:** 07 January, 2022, PreQC No. P-52978; **Reviewed:** 11 January, 2022, QC No. Q-52978; **Revised:** 16 January, 2022, Manuscript No. R-52978; **Published:** 21 January, 2022, DOI: 10.37421/2684-4591.2022.6.144