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ASSESSMENT OF THE FUNCTIONAL STATE OF CARDIOVASCULAR DISEASES IN YOUNG ATHLETES

Abstract. Despite over the past few decades incidence and mortality rates of cardiovascular disease are declining in many countries, there are currently still about 126 million cases of ischemic heart disease (IHD) in the world. IHD also remains one of the leading causes of death, accounting for over 9 million deaths per year worldwide. The aim of this review is to provide a detailed and updated description of the role of sport and physical activity both in primary prevention and secondary prevention. A child's body differs from an adult in rapid growth and development, active formation of organs and systems. Regular training in childhood increases the functional and adaptive reserves of the body, promotes health, and increases physical and mental performance [3]. Changes in the cardiovascular system, detected using functional diagnostics methods, are a kind of indicator of the adaptive activity of the whole body. The central link of the entire circulatory system is the heart, the functional state of which is also reflected in the electrical and mechanical manifestations of its activity [4]

Key words: sport, lifestyle, risk, ischemic heart disease,

In primary prevention, sport and physical activity are effective through the control of the main cardiovascular risk factors, such as hypertension and dyslipidemia. In secondary prevention, sport and physical activity can lead to a reduction in subsequent coronary events. Physical activity has undeniable benefits in the prevention of cardiovascular disease, therefore it must be advised to everyone, irrespective of the cardiovascular risk status, to maintain an optimal health condition. Moreover, in the presence of underlying CCS, intensive physical exercise may act as a trigger for life-threatening ventricular arrhythmias and sudden cardiac death (SCD). Pre-participation cardiovascular screening can be very important to early detect disorders associated with SCD, and to prescribe the safest exercise program for every single patient. The importance of physical activity for health and longevity has been promoted since ancient times. Even Hippocrates already advised that lack of physical exercise was detrimental to health[1]. Different mechanisms by which physical activity may prevent cardiovascular disease have been assumed, such as changes in blood pressure (BP), vascular function, insulin sensitivity, lipids pathway, skeletal muscle metabolism, and body mass index[2]. On the other hand, it was also shown that physical exercise might prevent cardiovascular diseases independently of its potential benefit on cardiovascular risk factors: some changes in inflammatory and hemostatic activation (reduced blood concentrations of several inflammatory biomarkers such as C-reactive protein, lipoprotein-associated phosphor-lipase A2, cytokines interleukin [IL]-1 β , IL-6, and tumor-necrosis factor- α) have been observed in athlete's laboratory analysis and were supposed to be possible underlying factors[1]. Furthermore, even when exercise programs in primary prevention fail to prevent people from ACS, it seems to act in a protective way as well. An interesting analysis by Pitsavos et al specifically evaluated the association between physical activity levels and clinical outcomes at presentation and 30-day prognosis of hospitalized patients with ACS. An inverse association was observed between the level of physical activity and troponin-I at presentation; furthermore, prior physical activity was associated with reduced severity of ACS, reduced in-hospital mortality rates, and improved short-term prognosis.

People who suffer from hypertension and want to take part in sports activities, should be properly evaluated as regard their risk profile and the activity intensity they'd like to perform. Current guidelines[5] suggest four risk levels (low, moderate, high, and very high) according to the hypertension grade and the presence of other risk factors or disease. Once established the risk, the recommendations are different: (i) hypertensive individuals at high and very high cardiovascular risk should be only eligible to skills sports; (ii) hypertensive individuals at moderate cardiovascular risk, once demonstrated well-controlled BP during exercise (SBP during exercise <240 mmHg for men and <220 mmHg for women) may be eligible to competitive sports except for activities requiring strenuous efforts, even for a short time (weightlifting, bodybuilding); (iii) hypertensive individuals at low cardiovascular risk may be eligible to every type of competitive sport; anyway, if high-intensity sports participation is desired, a pre-participation assessment to identify athletes with exercise-induced symptoms and excessive BP response to exercise is warranted. All these efforts are aimed at ensuring the performance of sporting activities in safety. The perceived and objective benefits of participation in sports for children and adolescents are numerous and span multiple domains, including physical, physiological, and social development. First and foremost, participation in sports fosters vigorous physical activity and energy expenditure. Organized sports have been shown to assist in breaking the vicious cycle of inactivity and unhealthy lifestyle by improving caloric expenditure, increasing time spent away from entertainment media, and minimizing unnecessary snacking. The chaotic lifestyles of working parents have facilitated an increase in consumption of "meals on the go", which are often higher in calories, fats, and sugars. The average American now consumes 31% more calories, 56% more fat, and 14% more sugar than in previous years[6]

Other reasons cited for sports attrition linked to coaching behavior included favoritism, poor teaching skills, and increased pressure to win, all of which created a negative atmosphere and decreased the fun of playing sport. A direct correlation is noted between a positive or negative sporting experience and attrition rate. Participation in sport is widely believed to improve moral character, sportsmanship, and ability to collaborate towards a common goal. However, these secondary gains in sports participation cannot be assumed and must be facilitated by positive role modeling on the part of parents and coaches. Accordingly, facilitation of a negative sports environment by adults who are directly or indirectly involved in supervision of youth programs results in negative social behavior. Sports and recreation should be a fundamental part of children's lives, despite troubling signs in the youth sports culture. Sport provides a medium for physical activity, developing friendships, and learning developmental skills across all domains. In the current environment of childhood obesity, fostering activity is vital to children's health and well-being. The multiple health benefits for children of all ages who participate in vigorous physical activity are well documented. Organized youth sports, when focused on fundamentals, facilitate physical activity while providing enjoyment for the young athlete. Fostering a positive youth sports experience is the accumulation of multiple factors, ie, matching the child's readiness with the demands of the sport, positive behavior from coaches and parents, realistic goal setting, and appropriate methods in place for injury reduction and management. Reducing sports attrition is necessary for sustaining sports participation and facilitating physical activity into adulthood. The challenges faced by US adults who recognize the need to facilitate change in the youth sport culture are significant, complex, and varied across ethnic cultures, gender, communities, and socioeconomic levels. It appears that an emphasis on having fun while establishing a balance between physical fitness, psychologic well-being, and lifelong lessons for a healthy and active lifestyle are paramount for success.

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