



CARDIAC ARREST AT REST AND DURING SPORT ACTIVITY: CAUSES AND PREVENTION

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ABSTRACT:

The benefits of exercise for cardiovascular and general health are many.However,sudden cardiac death(SCD) may occur in apparently healthy athletes who perform at the highest levels.A diverse spectrum of diseases is implicated in SCD in athletes and while in atherosclerotic.coronary artery disease predominates in individuals of >35 years of age,primary cardiomyopathy and ion Channelopathies are prevalent in young individuals.The best strategy to further decrease sudden cardiac death during sports activity in combining early diagnosis with widespread availability of defibrillators on site.

KEYWORDS:Sudden cardiac death,Autopsy,Screening

INTRODUCTION:

Sudden cardiac death is the swift and unexpected ending of all heart activity. Breathing and blood flow stop right away. Within seconds, the person becomes unconscious and dies. Sudden cardiac death in seemingly healthy people under age 35 is rare. It's more common in males than in females.When sudden death occurs in adolescents and young adults, it's sometimes due to undiagnosed heart conditions such as a genetic heart disease.he incidence in the Veneto Region of SD in young people and athletes aged between 12 and 35 years, a rate of 1 per 100 000 subjects/year was calculated, and in most cases was not preceded by premonitory signs or symptoms.

MECHANISMS OF SUDDEN CARDIAC DEATH:

The physiopathological mechanisms of cardiovascular Sudden death are 'mechanical', when there is a sudden impediment to blood progression (e.g. cardiac tamponade, pulmonary embolism), and 'electrical' due to arrhythmia (ventricular fibrillation, ventricular tachycardia, or asystole).

HEART DISEASE AT RISK OF SUDDEN DEATH IN YOUNG PEOPLE:

Aorta

The aorta can tear spontaneously and suddenly during exertion leading to massive bleeding. Young subjects at risk of SD due to aortic rupture can be hypertensive (main risk factor in adult-advanced age), but more often they are carriers of Marfan syndrome and bicuspid aortic valve with or without isthmus coarctation..

Coronary artery diseases

Coronary atherosclerosis

In the normal circulation of heart arteries carry oxygen-rich blood from your heart to your entire body. When you're young and healthy, they're wide enough to allow the blood to flow through easily. "Atherosclerosis usually starts in the teens and 20s, and by the 30s we can see changes in most people," says cardiologist Matthew Sorrentino MD, a professor at The University of Chicago Medicine. Mostly in the young man, fibro-cellular or fibro-atheroma atherosclerotic plaques are often found, often with a fibrous cap, uncomplicated, achieving a critical stenosis, mostly at the level of the anterior descending branch. Only the use of non-invasive imaging techniques for the study of the coronary artery tree, such as magnetic resonance imaging (MRI) or computerized tomography, can help identify those at risk.

Congenital anomalies of the coronary arteries

The right ventricular arrhythmogenic cardiomyopathy (RVAC) in the experience of the Veneto Region turns out to be the second cause of SD in the young and the first in the young athlete. Hypertrophic cardiomyopathy (HCM) is characterized by mostly asymmetric hypertrophy of the left ventricle, usually anteroseptal, more rarely apical, not due to ventricular pressure overload. In the USA, it has been identified as the main cause of SD in athletes, while in Italy it is almost always identified in the screening with consequent non-suitability of the athletes people affected by more.

Diseases of the valves

Valvular heart disease (VHD) is usually an age-related degenerative process, predominantly affecting individuals in their fifth decade and onwards. Regular exercise should be encouraged in the elderly population with VHD to avoid physical deconditioning and frailty whilst balancing the risks and consequences of the possibility of accelerated progression of VHD. These recommendations for exercise in athletes with VHD focus on competitive athletes. Arrhythmic SD can occur in conditions of valvular disease such as aortic stenosis and mitral valve prolapse, in the absence of heart failure.

Disorders of the conduction system

The sino-atrial or atrio-ventricular conduction disturbances are commonly seen in athletes. They are due to predominant effect of the parasympathetic tone. Since the accessory fasciculus consists of ordinary myocardium, this pathology leads to a loss of the normal AV delay, so that an episode of atrial fibrillation can turn into a ventricular fibrillation to the athletes and most common young people.

Diseases of ion channels

In about 10–20% of juvenile SD, the heart appears to be structurally normal at macroscopic, histological, and ultra structural investigation and is called unexplained SD or ‘mors sine materia’. It is a hereditary disease and molecular investigations have identified mutations in the genes that code for calcium receptors, responsible for calcium homeostasis during electromechanical coupling.

Prevention of sudden cardiac death in young people and athletes

Different methods allow prevention of SD. The external defibrillator, if used promptly within 2–3 min of collapse, can be effective in order to prevent irreversible brain damage. These tools should be made mandatory in all public places (schools, gyms, discos, and playgrounds). In the incidence of sudden cardiac death (SCD) in athletes is significantly lower than the general population. However, when SCD occurs in an athlete during sporting event or training, it sends shockwaves in the society and raises questions about cardiovascular effects of sports and exercise.

Conclusions:

Many advances have been made in the prevention of SD in young people and athletes. The main cause of SD in young people is of a cardiovascular nature. The effort is the triggering factor, and the SD is triple in athletes vs. non-athletes, and sports disqualification is life-saving in itself. The identification of hidden cardiomyopathies is possible with ECG and echocardiography and has led to a marked decrease in SD in the athlete in Italy. The systematic evaluation of the risk factor for atherosclerosis and disease and non-invasive coronary imaging techniques in selected cases will help to identify young people with hidden coronary artery disease who are still not diagnosed.

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