Скрининг Сердечно-Сосудистых Заболеваний У Спортсменов

Abstract: Attitudes towards the health effects of sports are radically different between the population and health professionals. There is a perception among ordinary people that athletes are definitely healthier, and doctors say that irregular high-intensity stress in athletes affects the entire cardiovascular system, mainly the body. In athletes, pathology of the cardiovascular system occupies one of the first places in the structure of their general disease. This article outlines the basic screening methods for early detection of cardiovascular disease in athletes.

Key words: sports, screening, vasovagal syncope, cardiomyopathy.

Introduction. The attitude to the impact of sports on health among the population and among medical workers is fundamentally different. Among ordinary people, there is an opinion that athletes are people who are certainly distinguished by good health, while doctors believe that sports imply loads that can destroy the body. The triumph of sports achievements is watched by millions of people, while the disappointing statistics are known to few experts.

Material and methods. The pathology of the cardiovascular system in athletes occupies one of the first places in the structure of their overall morbidity. Traditionally, most epidemiological studies, incl. concerning morbidity in athletes is held in the United States, respectively, they have become the main source of information for this article. Research Group Harmon K.G. et al. [1] Based on the analysis of the database of the National Association of University Athletes for 2003-2013, which included 514 cases of sudden death, made a number of interesting conclusions. According to the data obtained, the most common cause of sudden death in athletes is accidents such as a car crash, drowning, falling from a height, etc. (N-257; 50%), and only in second place are diseases (N-147; 29%), of which the majority are cardiovascular (N-7; 15%).

The most common autopsy findings were sudden unexplained death without morphological changes (N-16; 25%), as well as hypertrophic cardiomyopathy (N-5; 8%). According to Maron B.J. and co-authors [2], who studied the National (USA) Register of Sudden Death in Athletes for the period from 2002 to 2011, out of 152 deceased athletes (mean age 20 + 1.7 years, 85% men, 64% whites) 31 cases of suicide were registered, 21 cases of fatal alcohol poisoning and 64 cases of sudden cardiac death. At autopsy in athletes who died as a result of cardiovascular diseases, in 21 cases the cause of death was hypertrophic cardiomyopathy and in 8 cases - congenital anomaly of the coronary vessels.
The same scientists in an earlier and larger study [3], covering the period from 1980 to 2006, analyzed the causes of 1866 sudden deaths in athletes. It turned out that the contribution of cardiovascular diseases to the structure of mortality among athletes is the greatest (N=1049; 56%). However, in this number, the researchers also included cases of heart injury and heat stroke (N = 416; 22%). At the same time, 937 (89%) of the deaths were males and only 112 (11%) were females (although it should be borne in mind that women are less likely to play sports). Sudden cardiac death was more common in non-white athletes than in white athletes (64% versus 51%, p = 0.001).

Among the deceased were representatives of 38 sports, however, the highest mortality was found among those who go in for basketball (N = 349; 33%) and football (N = 281, 25%). Sudden cardiac death occurred predominantly during training or participation in competitions (N = 844; 80%), while the number of deaths during normal household activity, rest and sleep was 4 times less (N = 205; 20%). In this study, as in those previously described, the most common causes of death due to cardiovascular disease were hypertrophic cardiomyopathy and congenital coronary artery anomalies[17,18]. The practice of examining athletes before a competition has existed for a long time, but for a long time it was not unified and was based on local protocols of clinical examination.

In 1996, the American Heart Association developed and implemented guidelines for screening cardiovascular diseases in athletes, which in 2007, almost unchanged, were again approved and accepted by this organization [5,6,16]. The 2007 recommendations consist of 12 points (8 of them refer to complaints and anamnesis and 4 to the results of a physical examination):

**Results and discussion.** Complaints and anamnesis:

1. Pain / discomfort in the chest during exercise
2. Unexplained syncope / light-headedness †
3. Severe / unexplained dyspnea on exertion
4. Previously detected murmur in the region of the heart
5. Arterial hypertension
6. Premature death (sudden or unexpected) before the age of 50 due to cardiovascular disease in> 1 relative
7. Heart disease in close relatives <50 years of age
8. The presence of the following cardiovascular diseases in close relatives: hypertrophic or dilated cardiomyopathy, long QT interval syndrome or other canalopathies, Marfan syndrome, or clinically significant arrhythmias
9. Murmur in the region of the heart
10. Pulsation on the femoral arteries (to exclude coarctation of the aorta)
11. External signs of Marfan syndrome
12. Measurement of blood pressure on the upper limbs (sitting)

Notes: * when examining young athletes, the presence of parents is recommended when taking anamnesis and complaints, it is necessary to exclude the neurocardiogenic nature of syncope (vasovagal syncope), special attention should be paid to syncope that occurs during exercise. Auscultation should be performed both lying and standing (or with the use of the Valsalva maneuver), especially if dynamic obstruction of the LV outflow tract is suspected, it is advisable to measure on both upper limbs. The presence of one or more positive screening criteria indicates the need for an in-depth cardiovascular examination.
While the American guidelines do not consider the electrocardiogram (ECG) as a mandatory screening step, the European Society of Cardiology and the International Olympic Committee consider this study necessary [7,8]. The work of Corrado D. et al. provides an extensive list of pathological changes on the ECG that can be promptly detected during screening [9]. The information is presented by the authors in the form of a cumbersome table, which we will not reproduce, limiting ourselves to the remark that all ECG changes (except for those that are the result of direct sports loads) require further in-depth cardiovascular examination. By the way, Italian scientists in their article cite examples of benign ECG changes in athletes - in particular, sinus bradycardia, atrioventricular block of the 1st degree, incomplete right bundle branch block, early myocardial repolarization syndrome, isolated voltage QRS criteria for left ventricular hypertrophy. Revealing only these changes does not require additional examination. In turn, discussing the so-called "Lausanne Recommendations" of the International Olympic Committee for Screening of Cardiovascular Diseases (2004), Hamilton B. et al. reasonably note that echocardiography (EchoCG) can be more sensitive than ECG in the diagnosis of cardiovascular diseases (in particular, hypertrophic cardiomyopathy) [10]. Nevertheless, at present, echocardiography remains among the methods of in-depth cardiovascular examination. Interestingly, while in a number of European countries (Germany, France, Great Britain, Norway, Poland, Belgium, Netherlands, Luxembourg) ECG is considered a mandatory screening method, in some countries (Spain, Sweden, Greece) this study is only "recommended".

In addition to the clinical value, the financial component of the problem also influences the use of ECG in screening. Maron B.J. and co-authors, on the basis of theoretical calculations, conclude that on a US scale, mandatory ECG examination will increase the cost of screening people involved in sports by $ 500 million per year, only marginally improving the diagnosis of cardiovascular diseases [6]. At the same time, other American researchers consider the use of ECG for screening financially justified and effective [11]. According to the recommendations of the European Society of Cardiology [7], if an in-depth examination of the cardiovascular system did not reveal any diseases, the athlete is allowed to play sports without restrictions.

If a cardiovascular problem has been identified, there are three possible solutions: 1) with minor violations - sports are possible without restrictions, 2) with moderate impairments, sports are possible with limited dynamic and static loads, 3) with pronounced impairments, sports are contraindicated. The European guidelines describe in detail the methods for assessing the severity of cardiovascular diseases, as well as the algorithm for deciding about the possibility of playing sports. At the same time, despite the availability of detailed recommendations, the final decision in each individual case remains with the doctor.

Conclusion

Athletes require increased attention from doctors. This is due to the higher incidence of sudden cardiac death in this population. In addition, screening of athletes should be carried out according to a unified interview and physical examination procedure, and also include an ECG. Persons who, during the screening, were suspected or diagnosed with a disease of the cardiovascular system, should undergo an in-depth examination, based on the results of which a decision is made about the possibility of playing sports. Given that the majority of sudden cardiac deaths in athletes occur during sports activities, medical and coaching personnel serving competitions and training should be prepared for cardiopulmonary resuscitation using defibrillators.

List of references:


