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Medical examinations of professional and amateur athletes at a sports medicine clinic. Insights from a sports medicine specialist and cardiologist

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Abstract: In 2019, three regulations of the Minister of Health regarding sports medicine examinations in children, adolescents and young athletes came into force. The publication presents in detail the current scope of tests and the frequency of required medical examinations necessary to obtain medical certificates qualifying patients to practice sports. The publication also presents the Regulation of the Minister of Health on the required qualifications of doctors authorized to issue medical certificates to athletes. It is very important to properly assess the health of potential and current athletes to ensure their safety while participating in sports competitions. There are diseases that increase the risk of sudden cardiac death which doctors should keep in mind when qualifying athletes for competition. The publication draws attention to the underestimated role of echocardiography and electrocardiographic stress testing.

Keywords: sports medicine, medical examination of young athletes, qualification of doctors to issue medical certificates, preliminary and periodic examination of athletes up to 23 years of age.

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Background

From an early age we are encouraged to practice sports in accordance with the general principles of a healthy lifestyle. Children have a natural need to move, so they usually willingly participate in organized sporting activities. Adolescents and adults often develop a passion for sports started at earlier stages of life or look for forms of exercise that are suitable for them. Regular training leads to adaptations in the body suited to the sport practiced. This applies to both the musculoskeletal system, as well as the circulatory and respiratory systems. Due to the purpose of this

article, adaptive changes will not be discussed in this publication. Before starting regular training in any discipline, regardless of the type of sport (competitive, amateur and any physical activity that involves participation in sports competitions), it is extremely important to undergo a medical examination of the potential candidate to who wishes to participate in sporting activities, and assess for risks associated with practicing sports, especially the identification of the presence of risk factors for sudden cardiac death. Currently, in order to facilitate access to sporting activities for children and adolescents, doctors who are not sports medicine specialists have been allowed to issue certificates qualifying them to practice sports. The article presents the mandatory and key aspects of examining candidates and athletes from the point of view of a sports medicine specialist. The author of the publication has several years of experience in sports research and further experience in cardiology research.

Aim of the study

The aim of the article is to present the subjective and objective examination of candidates for practicing sports as well as professional and amateur athletes in accordance with current guidelines. Insights from the point of view of a sports medicine specialist and cardiologist.

Materials and Methods

Presentation of the current Regulations of the Minister of Health regarding the assessment of the ability to practice sports by children and adolescents up to 21 years of age and by athletes between 21 and 23 years of age. Presentation of the perspective of a cardiologist and sports medicine specialist.

Discussion

Every person participating in a sporting event organized by a Polish sports association is referred to as an "athlete" according to Article 37 of the Act on Sport of June 25, 2010 [1]. Pursuant to the Regulation of the Minister of Health of April 14, 2011, the athlete is subject to general medical examinations as well as specialist and diagnostic tests to the extent necessary to issue a medical certificate on their health, which enables safe participation in sports competition. Competition includes participation in training or competitive events [1].

In 2011, according to the Regulation of the Minister of Health, a medical certificate confirming the ability to practice a given sport will be issued after:

1) preliminary medical examinations of children and adolescents up to 21 years of age applying for this certificate;
2) periodic medical examinations of children and adolescents up to 21 years of age practicing a given sport and athletes between 21 and 23 years of age;
3) medical check-ups of children and adolescents up to 21 years of age practicing a given sport and athletes between 21 and 23 years of age who have suffered injuries while practicing a given sport, including head trauma, overload injuries, loss of consciousness, defeat by knockout or when another disease prevents participation in sporting activities or competitions [2].

Until 2019, such examinations were only carried out by a sports medicine specialist, and in the case of persons with disabilities, these examinations could also be carried out by a medical rehabili-

tation specialist [2]. Similarly, a doctor with a certificate of completion of an introductory course in sports medicine could issue a certificate in the absence of a sports medicine specialist [2]. The Minister of Health issued a Regulation on February 28, 2019, which changed the qualifications required of doctors to issue medical certificates on athlete health [3, 4]. There has also been a change in the scope and frequency of required medical examinations necessary to obtain these certificates [3].

In light of this Regulation, a primary care physician, based on a screening medical examination (health surveillance) and medical documentation available, may issue a medical certificate authorizing children and adolescents up to the age of 19 to participate in sports training and competitions [3, 4]. For athletes between 19 and 23 years of age, a certificate may also be issued by a primary care physician based on medical documentation [4]. There are two situations where a primary care physician may issue a referral to a sports medicine specialist or medical rehabilitation specialist in order to issue a medical certificate. Firstly, if the scope of tests necessary to conduct a proper assessment of the health and ability to safely participate in sports competitions are beyond the scope of a screening medical examination (health surveillance) and the medical documentation available. Secondly, if a primary care physician deems it necessary for the proper assessment of health and ability to safely participate in sports competition [3]. According to the author's own observations, the second reason is the most common reason for referral of an athlete to an examination by a sports medicine specialist.

According to the Regulation of the Minister of Health of February 28, 2019 [5], the guaranteed services of outpatient specialist care have changed. General, specialist and diagnostic tests are to include, in accordance with the aforementioned regulation:

1) anthropometric tests, i.e. measurement of the athlete's height, assessment of body weight, measurement of body fat
2) mandatory laboratory tests: urinalysis, complete blood count with white blood cell differential and serum glucose concentration
3) other diagnostic tests:
   a) 12-lead electrocardiogram with interpretation for all competitors
   b) spirometry for people planning to participate in scuba diving training
4) medical examinations that should be carried out for all candidates and atheletes include a general medical examination with an assessment of dentition and visual acuity using a Snellen chart, as well as an orthopedic examination. In some cases, as described later, a neurological consultation is necessary [5].

Preliminary medical examinations, i.e. of persons applying for a medical certificate allowing them to practice a given sport, which should be carried out in children and adolescents under 21 years of age, include the aforementioned tests: anthropometric measurements, general medical examination with an assessment of dentition, visual acuity assessment using a Snellen chart, orthopedic examination and 12-lead electrocardiogram and interpretation, as well as laboratory tests: urinalysis, complete blood count with white blood cell differential and serum glucose concentration[5].

Athletes who intend to practice combat sports must undergo a neurological consultation [5]. For people who plan to go scuba diving, spirometry is required [5].

Periodic medical examinations of children and adolescents up to 21 years of age and athletes between 21 and 23 years of age are carried out annually in accordance with the Regulation of the Minister of Health. The scope of periodic medical examinations includes anthropometric

measurements, general medical examination with the assessment of dentition, visual acuity assessment using a Snellen chart, orthopedic examination, 12-lead electrocardiogram and interpretation and laboratory tests: urinalysis, complete blood count with white blood cell differential and serum glucose concentration [5]. Every two years, a neurological consultation is required for people who practice combat sports [5]. Spirometry is required for those who scuba dive [5].

In athletes up to 16 years of age, if their health status or the specificity of a given sports competition require it, additional tests are carried out every 6 months: anthropometric measurements, general medical examinations, and orthopedic examinations [5].

When establishing the date of the next periodic medical examination, one should remember that it should be conducted prior to the expiry of the medical certificate confirming the ability to practice a given sport [5].

Summary

Significant observations from the perspective of a sports medicine specialist and cardiologist

From a cardiologist's point of view, it is important to identify the presence of risk factors for sudden cardiac death in a candidate for regular sports training. The time spent on a detailed medical history is crucial. A detailed family history is very important, especially when asking about sudden cardiac death, such as in parents or siblings. Obtaining information about diseases occurring in the family of candidates for regular sports training and athletes that may cause sudden cardiac death is important; these include hypertrophic cardiomyopathy, arrhythmogenic cardiomyopathy of the right ventricle, myocardial bridging, aortic stenosis, channelopathies or other diseases, such as sarcoidosis [6].

We should not underestimate the importance of questions regarding an athlete's current well-being and any new symptoms that have occurred since the last examination. One should always ask about symptoms suggestive of myocarditis and if there is any suspicion, appropriate measures should be taken. Additionally, new symptoms suggestive of heart disease, such as pericarditis or myocarditis, require a specialist cardiological examination, including echocardiography.

The ability to interpret an electrocardiogram allows for the detection of diseases associated with the risk of sudden cardiac death. These include: Brugada syndrome, pre-excitation syndrome, arrhythmogenic right ventricular cardiomyopathy, hypertrophic or dilated cardiomyopathy, long and short QT syndrome, Lenegre disease or ischemic heart disease [5].

Due to their cardiological expertise, the author of the publication sees the profound value of echocardiography. Some diseases are imperceptible on electrocardiography, but cardiac imaging can detect the disease, establish a diagnosis, and allow for the implementation of appropriate treatment. Sports disciplines have different dynamic and static components. Mitchell proposed a classification of sports disciplines in 1994, which facilitated the qualification of athletes with cardiovascular diseases for specific sports disciplines [6].

According to the current Regulations of the Minister of Health, an electrocardiographic exercise stress test is not required. According to the author of the publication, this test is very important for athletes and candidates for regular training. There are diseases that cannot be detected in a resting electrocardiographic examination but are detectable during an exercise electrocardiographic examination, e.g. exercise-induced myocardial ischemia or catecholaminergic polymorphic ventricular tachycardia, which would disqualify one from practicing sports [7].

Despite the lack of mandatory recommendations, from a cardiologist's perspective, it is worth performing an echocardiographic examination, an electrocardiographic stress test and, in selected cases, 24-hour Holter electrocardiogram monitoring (e.g. in the case of numerous additional premature ventricular contractions in a resting electrocardiogram examination) for each athlete undergoing regular training. This will allow for a thorough assessment of potential candidates and young athletes, and thus allow for the safe practice of sports and subsequent success.

Conflict of interest

None declared.

Informed consent

Not applicable.

References

1. Dziennik Ustaw Rzeczypospolitej Polskiej 2011 nr 88 poz. 502 Rozporządzenie Ministra Zdrowia z dnia 14 kwietnia 2011 r. w sprawie kwalifikacji lekarzy uprawnionych do wydawania zawodnikom orzeczeń lekarskich o stanie zdrowia oraz zakresu wymaganych badań lekarskich niezbędnych do uzyskania orzeczenia lekarskiego. https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20110880502.
2. Dziennik Ustaw Rzeczypospolitej Polskiej 2011 nr 88 poz. 500 Rozporządzenie Ministra Zdrowia z dnia 14 kwietnia 2011 r. w sprawie trybu orzekania o zdolności do uprawiania danego sportu przez dzieci i młodzież do ukończenia 21. roku życia oraz przez zawodników pomiędzy 21. a 23. rokiem życia. https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20110880500.
3. Dziennik Ustaw Rzeczypospolitej Polskiej 2019 poz. 395 Rozporządzenie Ministra Zdrowia z dnia 27 lutego 2019 r. zmieniające rozporządzenie w sprawie kwalifikacji lekarzy uprawnionych do wydawania zawodnikom orzeczeń lekarskich o stanie zdrowia oraz zakresu i częstotliwości wymaganych badań lekarskich niezbędnych do uzyskania tych orzeczeń. https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20190000395.
4. Dziennik Ustaw Rzeczypospolitej Polskiej 2019 poz. 396 Rozporządzenie Ministra Zdrowia z dnia 27 lutego 2019 r. zmieniające rozporządzenie w sprawie trybu orzekania o zdolności do uprawiania danego sportu przez dzieci i młodzież do ukończenia 21. roku życia oraz przez zawodników pomiędzy 21. a 23. rokiem życia. https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20190000396.
5. Dziennik Ustaw Rzeczypospolitej Polskiej 2019 poz. 397 Rozporządzenie Ministra Zdrowia z dnia 27 lutego 2019 r. zmieniające rozporządzenie w sprawie świadczeń gwarantowanych z zakresu ambulatoryjnej opieki specjalistycznej. https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20190000397.
6. *Jegier A., Nazar K., Dziak A.*: Medycyna Sportowa. Wydawnictwo Lekarskie PZWL. 2013.
7. *Trusz-Gluza M., Leśniak W.*: Wielokształtny częstoskurcz komorowy zależny od katecholamin (CPVT). 10 sierpnia 2023. https://www.mp.pl/interna/chapter/B16.II.2.6.13.