

Evaluation of the Functional Status of the Respiratory System in Students

Kurbanov A.Sh., Dustov K.T., Sagatov H.Q.
Karshi State University

Summary

The article is devoted to the study of the problems of ensuring the normal functioning of the students' body and protecting their health. For this purpose, the functional activity of the respiratory organs was assessed in this population. The study used generally accepted methods for studying the activity of the respiratory system with the determination of capacitive and volumetric indicators of the respiratory system.

The results of the study showed a significant increase in the efficiency of the respiratory system in student-athletes compared to students not involved in sports. At the same time, an increase in their ability to adapt to physical conditions was noted.

The results of the research carried out in the article were explained and summarized from a physiological point of view.

Introduction.

The level of human health is mainly determined by the body's energy capabilities and adaptability to various loads. In this case, the aerobic capabilities of the organism, i.e., the process of oxygen transport necessary for the production of energy in the body during physical work, and the potential of its use serve as a physiological basis. In addition, health and its condition depend on heredity, people's lifestyle, the presence of various exogenous risk factors and other factors.

The way of life of students is unique. Among the factors that have a negative effect on their health, it is possible to include the incompatibility of educational loads and teaching methods with the functional capabilities of the examinees' body, various stressful factors in life, and improper nutrition. The specific effects of mental and physical loads, especially their continuous increase, can act as a continuous stressor on the body of young people who have insufficient adaptive capabilities.

It is known that the maintenance of homeostasis in the body under various exogenous influences is primarily related to the activity of the autonomic nervous system. The importance of this system is determined by its participation in the control of substance and energy exchange, excitability, and activity of peripheral organs [3].

Adaptation to various stress factors, including physical loads, takes place with the participation of neurohumoral mechanisms of sympathetic and parasympathetic nervous systems and endocrine glands. The homeostatic state is maintained under various conditions due to the management activity of these systems and changes in

metabolic processes. In turn, long-term effects of stressors on the body can affect the functional capabilities of control systems and change its adaptive reserves.

It can be said that studying the activity of the respiratory system in students on the basis of research is one of the most necessary issues in terms of increasing the functional capabilities of the body and strengthening the health.

Methods.

Based on the above, research was conducted among the 1st-year students of Karshi State University (62 students) who go for sports and those who do not. In order to assess the functional state of the body, students were divided into sports-playing and non-playing groups.

The following parameters of the respiratory system of the students at rest and in conditions after physical activity were studied, such as respiratory rate, tidal volume, minute respiratory volume, vital lung volume, inspiratory reserve volume, expiratory reserve volume, total inspiratory volume.

The Harvard step test, widely used in assessing the functional capabilities of the cardiorespiratory system, was implemented as physical activity.

Results and Discussion.

The functional indicators of the respiratory system were checked in order to assess the adaptability of students to educational workloads. Based on the obtained results, it can be recognized that the functional state of the respiratory system in young students is at a satisfactory level of flexibility. The reserve capacity of the respiratory system is somewhat reduced. Nevertheless, it was found that the functional capacity of control systems was sufficiently preserved in the examinees. This situation ensures that they are resistant to the effects of unfavorable factors in their educational activities and that the necessary functional capabilities of the organism are revealed for intensive mental and physical work.

According to the obtained results, due to regular physical exercises, the respiratory system functions efficiently both at rest and after physical exertion. Physical loads as a factor of adaptation provide an opportunity to increase the flexibility of the organism in extreme cases.

It was found that students who do not play sports have an average of 16.2 breaths per minute at rest. After loading, this indicator increased to 21.3, the living capacity of the lungs increased to an average of 2.8, after loading to 3.6 liters. In this group, the average volume of breath per minute was 8.4 liters at rest and 18.8 liters after loading. It was determined that the breath volume is 0.6, the inspiratory reserve volume is 1.3, the expiratory reserve volume is 0.9, and the total inspiration volume is 1.9 liters. After loading, these indicators were 0.7, 1.7, 1.4 and 2.4 liters, respectively.

In the group of students participating in sports, the average respiratory rate at rest was 13.3 breaths per minute, and after loading, this figure increased to 18.5 breaths. The living capacity of the lungs increased to 4.7 liters on average, and up to 5.3 liters after loading. In this group, the average volume of breath per minute was 10.5 liters at rest and 23.1 liters after loading. In them, it was found that the volume of breath is 0.8, the

volume of inspiratory reserve is 1.9, the volume of expiratory reserve is 1.7 and the total volume of inspiration is 2.7 liters. After loading, these indicators were 1.0, 2.2, 2.9 and 2.2 liters, respectively.

According to the results of the investigation, it was found that there were certain differences in the indicators of the respiratory function between the students who play sports and those who do not. In particular, the functional indicators of the respiratory system of sports students are at the standard level, and the respiratory indicators of non-sports students are around the standard limit. Nevertheless, the functional capabilities of the regulatory mechanisms are limited to a certain extent.

It is known that the acceleration of the external breath takes place due to the frequency of breathing and its deepening. In athletes, the increase in lung ventilation is mainly provided by the increase in breath volume.

Athletes have a much higher lung capacity than non-athletes. At the same time, the higher the vital lung volume, the less energy is spent on external respiratory movements [5]. The size of the vital lung volume is important in assessing the functional indicators of the life index, and it is at a high level in athletes. Athletes with a high level of exercise have a physiological efficiency of functions at rest.

As the frequency of breathing increases in athletes, its depth also increases. This, in turn, serves as the optimal way for the respiratory apparatus to adapt to physical loads. Doing physical exercises increases the reserve capacity of breathing [6]. As a result of regular training, the neuro-humoral control of breathing in the body of athletes improves. The respiratory system works in harmony with other systems during physical exertion.

The level of gas exchange in the lungs increases depending on the physical work performed and the oxidation-reduction processes taking place in the body. Vigorous exercise increases the body's demand for oxygen and causes a sharp (10-fold or more) increase in gas exchange in the lungs compared to rest. In other words, physical exercise adapts tissues to hypoxia and ensures active work of cells in conditions of oxygen deficiency.

Breath parameters determine the structural and functional adaptation reactions that occur in the body under the influence of physical load in the athletes' body [1].

Physical exercises increase muscle strength and provide adaptation to unfavorable factors of the external environment [2]. Also, physical activity accelerates blood circulation due to acceleration of heart rate and an increase of blood pressure. This situation leads to an increase in the functional capabilities of the cardiorespiratory system [4].

The obtained results confirm that the reserve capacity of the body and the efficiency of the respiratory system have increased in students who play sports compared to their peers who do not. This requires a more in-depth study of the activity of the respiratory system in students who are athletes and non-athletes.

Continuing these studies on a large scale and analyzing the results more physiologically will be important in solving the mentioned problem.

Adabiyotlar

1. Агаджанян Н.А. Экологическая физиология: проблема адаптации и стратегия выживания / X Междунар. симпоз. «Эколого-физиологические проблемы адаптации». – М., 2001. – С. 5-12.
2. Баевский Р.М., Берсенева А.П. Оценка адаптационных возможностей организма и риск развития заболеваний. – [http\med.alu.ru\](http://med.alu.ru/) 2009.
3. Дибнер Р.Д. Физкультура, возраст, здоровье / Р.Д. Дибнер. – М.: Физкультура и спорт, 1985. 80 с.
4. Копытова Н.С., Гудков А.Б. Сезонные изменения функционального состояния системы внешнего дыхания у жителей Европейского Севера России // Экология человека. –2007.
5. Макарова Г.А. Спортивная медицина. Учебник. М.: Советский спорт, 2003. – С. 478.
6. Смирнов В.М., Дубровский В. И. Физиология воспитания и спорта. – М.: Владос-пресс, 2002. – 347 с.