

## Human Capital

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### Features of external respiration of female students in the conditions of the North



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#### Abstract

The respiratory apparatus of the female students have been studied. A small voltage functional capacity of respiratory apparatus is found.

**Keywords:** *female students, the respiratory system, oxygen.*

In recent years, more and more actualized the need to radically improve the health of Russians, forcing a fresh look at the current situation in public health with the aim of changing for the better. The most important institution of the formation of an educated, skilled, cultural and intellectual elite of the state is the education system, in particular universities, and so in addition to specific educational purposes falls on the state and the task of maintaining the physical, mental and moral health of students.

It is known that the harsh climate of the North has high requirements for all systems of the body, and to the respiratory system, primarily because it can not be protected from the adverse effects of a reliable artificial barrier [1]. The apparatus of external respiration provides the body with oxygen to maintain an appropriate level of oxidation-reduction processes, the constancy of the acid-alkaline balance. In addition, the "northern light" the process of intensive heat, to warm the incoming cold air [4].

The aim of our study - to study features of the system of external respiration in freshmen students enrolled in NarFU named after Lomonosov aged 17-18 years.

#### *The organization of the research*

The study was conducted in the autumn-winter period in healthy women (39). Functional state of external respiration was assessed on an automatic spirometer "Spiros-100" ("Altonika", Moscow, Russia). With the help of this device was determined the following parameters: lung volumes and capacity - vital capacity (VC), inspiratory reserve volume (police department) and expiratory (ROvyd), tidal volume (TV), parameters of pulmonary ventilation - respiratory minute volume (RMV), the frequency respiration (RR), maximal ventilation (MVL). The results obtained were compared with students living in central Russia [3]. Thus, I have a group of students were in Arkhangelsk, II - secondary students in the band.

#### *The results of the research*

An important indicator that reflects the functionality of the respiratory system as a whole, is a VC. In a comparative evaluation of this quantity was found in students a slight increase in group I (2%) (Table 1). It is known that individuals with higher these indicators there is a great

opportunity to increase pulmonary ventilation and oxygen to the lungs and release carbon dioxide.

In the analysis of fractional VC revealed that the magnitude and the police department ROvyd differed little from the parameters obtained from the natives of the middle band.

Table 1

Indicators of external respiration,  $M \pm mn = 39$

Indicators	I group	II группа
Jel, l	$2,93 \pm 0,11$	$2,87 \pm 0,08$
POvs, l	$1,61 \pm 0,01^{**}$	$1,58 \pm 0,06$
POvid, l	$0,90 \pm 0,02$	$0,91 \pm 0,02$
do, l	$0,59 \pm 0,09^{**}$	$0,48 \pm 0,01$
mod, l/min	$10,63 \pm 0,61$	$8,48 \pm 0,34$
chd, in min	$18,5 \pm 1,06$	$17,6 \pm 0,94$
MVL, L/MIN	$72,06 \pm 3,26^{**}$	$65,97 \pm 0,91$

Note: The asterisks (\*) denotes a significant difference in actual values. \*\* -  $p < 0,01$ .

Along with the ROvyd, ROvyd vital capacity and tidal volume contains. Comparing this with students in group I revealed the depth of breathing increase by 8.6%. Exceeding these parameters have students living in the North, apparently contributes to increasing the number of functioning alveoli [2]. In this case oxygen is stepping in the right amount necessary to maintain the required level of thermal-induction, increasing the efficiency of ventilation [7].

The values of pulmonary ventilation is also higher in the first group I girls. Increasing minute volume of breathing for more than a factor of 1.2 indicates hyperventilation. Pulmonary ventilation is dependent on metabolic processes in the body. An individual living in areas of the North, the level of metabolism is higher than that of the inhabitants of temperate latitudes. Consequently, hyperventilation with students NArFU is adaptive mechanisms of external respiration in response to the increased need for oxygen, aimed at providing enhanced tissue metabolism at elevated energy expenditure [4].

Valuable parameter for evaluating lung is also a black hole. We surveyed students in Arkhangelsk found an increase in respiratory rate by 4.9%. This may indicate a certain voltage of respiratory function. But the magnitude of the black hole depends on the minute volume of respiration. A more rational in the North is considered to be an increase in the MOU due to a larger increase in UP than in respiratory rate [6]. Thus, the pulmonary ventilation with students in group I associated with simultaneous increase in tidal volume and respiratory rate, which is the most effective mechanism to ensure the optimum combination of high gas exchange while minimizing energy costs.

MVL function characterizes the possibility of using the apparatus of external respiration. This value is a summary measure of the ventilation apparatus of external respiration function and reflects the limits of the system of external respiration used to use the functional reserves. Studies have shown that the absolute value of the girls who live in the middle zone, below the 1.1 times than that of students in Arkhangelsk. It is known that MVL can be judged on the integral mechanics of breathing changes, since depends on the muscle strength of respiratory muscles, lung compliance and chest, as well as resistance to air flow. Therefore, the revealed a decrease in group II may indicate the development of lower respiratory muscles [5].

The results obtained from students in Arkhangelsk indicate a small voltage of the functional capacities of the apparatus of external respiration, lowering its compensation-Sathorn features. This response of the body most likely associated with the manifestation of defense reactions of respiratory system, designed to limit contact with the respiratory tract with cold air and reduce heat loss.

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