FUNCTIONS OF EXTERNAL RESPIRATION OF ADOLESCENTS SCHOOLS OF DIFFERENT TYPES IN ALMATY

Coulter, M.

Punjabi University, Patiala, India.

** Corresponding author: coultergds54@gmail.com*

Abstract

In recent decades, the atmospheric air of modern cities has become the most important risk factor for the health of the population, primarily children. Substances polluting the atmospheric air enter the human body, mainly through the respiratory system. According to the literature, children living in conditions of chemical air pollution, in comparison with their peers in ecologically safe areas, are characterized by lower growth and weight values and indicators of external respiration functions. In addition, among the students of the new type of schools, there are lower parameters of physical development, which requires further study [1, 2].

Introduction

We have studied the functions of external respiration of adolescents in eight schools of different types (gymnasiums, lyceums, general education) located in the districts of Almaty with minimum (control) and maximum (experimental) air pollution. The state of the respiratory system is an early and adequate indicator of changes in the state of human health, especially at an early age. It was assessed in adolescents according to spirometry data (vital capacity of the lungs - VC) and functional tests with breath-holding on inspiration (Stange's test) and on expiration (Genchi's test). Materials of the analysis of all studied age-sex groups (boys 13-16 years old and girls 12-15 lei) are characterized by unidirectional changes in the functions of external respiration with some deviations. The results of studies reflecting characteristic changes are presented on the example adolescents 15 years old in the table. one.

Table 1.

Indicators of the functions of external respiration of adolescents 15 years old , Almaty

Educational organizations	External respiration indicators (M ± m)					
	Control area			Experienced area		
	Rehearsal Bars, in sec.	Rehearsal Genchi, in sec.	WIND, in Jr.	Rehearsal Bars, in sec.	Rehearsal Genchi, in sec.	WIND, in Jr.
New type schools	36.8±2,0	30.1±1,3	2648,4±120,5	33,.2±1,5	29.2±1,5	2571,0±126,4
Secondary schools	39.7±2.3	38,7±1,3	2777,4±117,2	33.1±1.7	34,8±2,3	2664,5±124,0

A detailed analysis of all the material allows us to come to the following conclusions:

1. The greatest decrease in the indicators of functional tests and VC was noted in adolescents from schools in the experimental district of Almaty, with the same severity in both boys and girls ($p < 0.05$).

2. Adolescents of new types of schools (gymnasiums, lyceums) are also characterized by lower indicators of the functions of external respiration, in comparison with students of general education schools.

3. The state of the respiratory system of adolescents (vital capacity of the lungs and functional tests of Stange and Genchi) can serve as a sensitive indicator

of environmental and educational loads, since they do not require complex equipment and take a short time.

Thus, we have found that the chronic action of chemicals in high concentrations can cause changes in the health status of the child population long before the onset of pathological disorders. Adolescents exposed to chronic exposure to traditional and specific air pollutants and enrolled in new types of schools have lower lung capacity and functional tests of Genchi and Shtange.

The revealed changes in the state of health of students correspond to the data in the literature, but the question of cause-and-effect relationships in quantitative terms has hardly been elucidated to date. At the same time, his solution opens up the prospect of a hygienic forecast and directed priority measures.

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