



Cardiovascular System Both in Healthy and In Children with Vision Impairment

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Abstract The article reveals the cardiovascular system in healthy and visually impaired children. The main types of adaptation are analyzed.

Keywords Adaptation, heart rate, nervous system, physical education

Introduction

Currently, the importance of monitoring the physical development of the child population is emphasized, which allows the timely allocation of risk groups for the development of health disorders, and consequently, to develop preventive measures [1]. In addition, the study of the state of health of large groups of children with visual pathology living in a certain area allows us to study the regional features of the formation of health. Homogeneous groups of children are representative material and can be used to develop standards of health of children with visual impairment [2].

The health status of children and adolescents is determined by:

1. the level of achieved physical development and its harmony;
2. functional state of organs and systems;
3. presence or absence of functional abnormalities and diseases;
4. the resistance of the body;
5. mental health.

The leading criterion for the health of a growing organism is physical development, the level of which is closely related to socio – economic and hygienic living conditions. Physical development indicators can serve as a basis for social and hygienic monitoring and find their place in the characterization of the regional ecological and hygienic and sanitary-epidemiological situation [3].

Physical development (PhD) is one of the objective and generalizing parameters of children's health. Adequately implemented dynamic monitoring of the development of a growing human body is necessary not only to identify the individual characteristics of growth and maturation, pace and harmony of development, but also a very universal diagnostic "key" to determine the risk of disease and timely resolution of the issue of indications for in-depth examination.

It is known that PhD of children is an indicator of social and economic well-being of society, as well as sanitary and ecological state of the territory. It is development in the period of growth that determines the main features of the health of a generation in older ages, including potential longevity and the transfer of appropriate qualities to future generations.

Over the past decades, pediatricians, hygienists, physiologists, psychologists and educators have been concerned about the significant deterioration in the health of the younger generation, including major changes in PhD.



Everywhere there is an increase in the frequency of body weight deficit, stunting, decrease in physiometric and functional indicators of children.

The state of physical and sexual development of children is, first of all, one of the components of health characteristics. With the right approach to the interpretation of the results of physical development screening of children can be identified common patterns of human development in a specific period of time and in specific conditions, identified positive and negative trends and the emergence of negative changes in the child population [1].

Than at an early age is reduced or lost vision, the more pronounced abnormalities found in these children. It is established that children with visual impairment lag behind at all age stages. The most pronounced deviations in the physical development of the pupils of the senior classes. Body length in the blind and visually impaired to 17 years less on average by 5-5.5 cm compared to the norm. Also, the weight of the body in children with blindness and low vision is 4-5% lower compared to healthy peers. The same can be said about the difference in the circumference of the chest, so blind and visually impaired adolescents on average 4.8 cm less than healthy in the control. From the above it follows that a systematic lack of movement leads to a decrease in all vital functions of the body, worsens the General and local blood circulation, disturbed secretory function of the digestive tract and gas exchange in tissues and lungs, which leads to a deterioration in General health, reduced visual functions and performance of children. When changing, reducing indicators of respiratory function in children suffering from visual impairment, there are violations at all levels of the organization: organizational, organ, systemic, cellular, molecular-radical.

Adaptation (adaptation, adaptive responses) is the development of new biological properties of the body, species, biocenose, providing livelihoods bioscience in the change of the external environment or the parameters of the biosystem itself. Changes in the external environment are associated with the action of new, extraordinary, experimental factors, that is, natural, industrial, household, social and others. Change of parameters of biosystem can be caused by necessity to perform any work, morphofunctional transformations in ontogenesis (puberty, pregnancy, old age), violation of functions due to fatigue, disease in all cases, if the intensity and duration of external and internal factors is biologically significant, in the body (biosystem) There is a reorganization of activity, resulting in the formation of a state of adaptation, i.e. the ability to continue to livelihoods in new unusual conditions.

The following types of adaptation are singled out as the most typical and important:

1. Adaptation of children in the period of newborns and the first months of life to the conditions of the extrauterine existence;
2. Adaptation to new ecological conditions;
3. Adaptation to pre-school and school conditions;
4. Adaptation to physical loads;
5. Adaptation to professional activity [5].

To assess the adaptive and compensatory reactions of the organism of child in the norm and under the impairment in recent years, the importance of studying the adaptation of cardiac sinus rhythm by the method of evaluation of the initial vegetative tone and cardiointervalography (CIG).

Cardiac pacer is a special functional apparatus of regulation of physiological processes with universal form of constant regulation. Due to the numerous connections with vegetative centers, hypothalamus, cerebellum, bark of large hemispheres, adjustable by reflex and by humoral channels the cardiac pacer possesses wide range of control of activity of cardiovascular system, and in the shortest time segment can respond to the effects of physiological stimulus or stress factor.

In the domestic and foreign literature there are numerous reports about the structure of cardiac pacer in adults, in healthy children of early pre-school and school age, as well as in various diseases.

The most complete illumination is given in works of E. Grinin with co-authors//, who have carried out the analysis of 3459 rhythm strip recorded at long-term (1981-88) research of three groups of children aged 6-9, 10-14 and 15-18. Scientists have come to a conclusion that with growth and development of a child, there increases the functional possibilities of his heart, and becomes more perfect the autonomous regulation of cardiac activity and its correlation



with vegetative and central control mediate. However, this is uneven between the periods of 6 and 18 age. As a result of these researches, the highlighted the following critical periods:

- A. 6 years of age, when the functionality and autonomous regulation of cardiac activity are imperfect, and the influence of sympathetic and central control mediates is carried out with high exertion.
- B. 12-13 years for girls and 13-14 years for boys, when the level necessary for the function is achieved not by the reserve capacity of the heart, and the exertion of regulatory systems.

From 15-16 years the functional possibilities of autonomous and central regulation of cardiac activity become more perfect.

According to D. S. Taspulatova (1994) in healthy children cardiac pacer arrhythmia occurs more often in 7-8 years, and at the age of 10 the normotension is observed, i.e. state of sympathoadrenal and vagal mechanisms to some extent are balanced, and in 14 years increases cholinergic mechanism of influence on the heart of schoolchildren, which speaks about the effect of puberty on the indicators of CIG.

The nervous system, first of all its vegetative department is the main regulator of integrative responses of an organism, providing functional connection of systems of organs of safety of metabolic processes, interaction with the external environment. Violation of vegetative regulation leads to the emergence of syndrome angioneurosis. The main number of noncommunicable diseases has a functional nature, i.e. they are based on neurohumoral regulation of various organs and systems on the background of angioneurosis (A. M. Wayne 1987).

Recently, it is established that in a norm of strengthening of function of one part leads to compensatory tension of the other that returns a functional system to a state of homeostasis (A. M. Wayne 1971).

Physiological changes, which are the basis of sensory adaptation associated with the sanogenetic adaptive mechanisms of protection, preservation and strengthening of human health, affects both peripheral and central links of analyzers.

Adaptive mechanism of blind and visually impaired has differences in physiological aspect in comparison with normal seeing [4].

Thus, children suffering from vision impairment largely depend on the surrounding and the organism, on the motor mode, on the physical exertion that they receive during physical education. However, data on the impact of vision impairment on the organism as a whole, and in particular on the heart has not been enough studied.

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