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## MORPHOMETRIC CHARACTERISTICS OF PARAMETERS OF PHYSICAL DEVELOPMENT OF CHILDREN WITH VARIOUS HEART DISEASES

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### Abstract

The article analyzes the literature data on the physical development of children with various heart diseases and the anthropometric parameters of parts of the child's body, depending on the type of heart failure. The study of the laws of development, the creation of methods for its practical management, the normal development or, more precisely, the optimal development of children is one of the main parts of pediatric science and medical practice. When reviewing data from the available literature, we did not come across any data devoted to the study of anthropometric parameters of the body of children with various heart defects.

**Keywords:** indicators of physical development, children, heart defects.

### 抽象的

文章根据心力衰竭的类型，分析了各种心脏病儿童身体发育的文献数据和儿童身体部位的人体测量参数。研究发展规律，为其实际管理创造方法，正常发展或更准确地说，儿童的最佳发展是儿科科学和医学实践的主要部分之一。在审查现有文献中的数据时，我们没有发现任何专门用于研究患有各种心脏缺陷的儿童身体的人体测量参数的数据。

关键词：身体发育指标，儿童，心脏缺陷。

Health is a priceless happiness in human life. Each of us wants to be strong and healthy, maintain as much mobility, strength, energy and longevity as possible. The foundation of human health begins in childhood, so it is advisable to

start with healthy interests and habits, the value attitude to health.

The physical development of children is a specific indicator of the health of the population, in which periodic changes in the biological

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nature of man and short-term effects on the population can be observed. Physical development can serve as a criterion for assessing the environmental situation, and physical development standards are an important element of monitoring the health of children and adolescents in the population [1, 2, 3].

One of the important areas of human ecology is the study of changes in the state of physical development of children (BJR) at the population level, that is, from generation to generation. The study of anthropometric indicators of physical development is generally accepted as a method of adapting the body to the environment [4].

Morphometry is the study of the shape, size, and proportions of the organs of the human body. This is an important indicator for assessing the physical properties and growth patterns of the human body.

Anthropometry is defined as a study in terms of body size such as human body weight, height, chest circumference, skin thickness, bone width, as well as adipose tissue [6]. The term anthropometry is derived from the Greek word meaning “anthropo” - “man” and “metron” - “measurement”, anthropometry being the most important standardized and non-invasive method for studying human biological differences (WHO, 1995). Anthropometric indicators and body composition are important indicators of personality development. These indicators depend on age, gender, diet, ethnic group, and lifestyle [7].

Morphometric assessment is an important feature of geriatric nutrition assessment and is used to detect malnutrition, overweight, obesity, muscle weight loss, fat gain, and adipose tissue redistribution. Anthropometric indicators are used to assess the prognosis of chronic and acute diseases, as well as to manage medical intervention in young people [8].

Anthropometric indicators are useful at both individual and population levels. Anthropometric indicators can be used at the individual level to assess health or good nutrition. It is also useful in screening children of different ages. At the population level, anthropometry can be used to assess the nutritional status of a country, region, community, or socioeconomic group, as well as to identify malnutrition and its consequences. This form of monitoring is useful both for development and for studying the effects of nutrition on human health [9].

Various heart problems can affect the general condition of children. Such diseases include congenital heart defects, viral infections affecting the heart, and heart disease acquired in childhood due to hereditary syndromes. As a result, the physical development of children and their quality of life deteriorates, which in turn has a negative impact on the socio-economic development of the country [25].

Congenital heart defects (TCs) are one of the major problems in modern pediatrics [10]. Industrial development and environmental pollution lead to an increase in congenital defects [11]. In the Russian Federation, about 17,500 children with various disabilities are born every year, which is 249 per 100,000 people. 89% of congenital heart diseases are due to exposure to exogenous factors, which include radiation, viral infections, diseases experienced by the mother during pregnancy, drugs and chemicals, salts of heavy metals; 10% are caused by inherited chromosomal abnormalities or monogenic mutations [12, 13].

TYuN accounts for almost a third of all congenital anomalies and affects more than 1 million newborns worldwide each year [16]. TYuN is associated with pathophysiological changes, i.e., low energy requirements,

malabsorption, hypermetabolism, and sometimes gastrointestinal tract dysfunction. Children with TYuN have a higher risk of malnutrition [14, 15]. Previous studies have shown that almost half of the children with TYuN suffer from short stature, and 15% of patients suffer from malnutrition on average and weight [18].

Malnutrition is a common disease in children with TB. Malnutrition can be caused by insufficient or insufficient intake of food, excessive energy consumption, frequent respiratory infections, limited growth potential, and genetic syndromes. Data showed that preoperative malnutrition accounted for 45% of children living in developing countries [17].

Simultaneous decrease in growth trajectory, head length and circumference is observed in children with congenital heart defects [20, 22].

Congenital heart defects are the most common heart disease in children [19]. However, rheumatic heart disease (RHD) remains an important problem, especially in developing countries. An analysis of the literature showed that the prevalence of rheumatic heart disease (RHD) in schoolchildren ranged from 0.7 (Egypt) to 2.4 per 1,000 students (Solomon Islands [21]). Gale S.R. and according to other authors, Acquired heart defects in Nepal occur in 2.5 to 10.2 per 1,000 students [22].

Currently acquired heart defects are a topical problem in pediatric cardiology. The main causes of their formation in childhood are rheumatic fever and infectious endocarditis [23]. In addition, the prevalence of rheumatic fever in the Russian Federation ranges from 0.2 to 0.8 per 1,000 children, and the incidence of infectious endocarditis is 46.3 cases per 1 million population [1].

Children are the most vulnerable age group for acquired heart defects (OYuN). Lack of information among parents and the inability of

children to express symptoms of the disease leads to a delayed diagnosis, which is accompanied by serious complications. In addition, low literacy rates, family planning, overpopulation of families, and poor hygiene practices, such as inadequate health care in poor countries such as Nepal, often lead to delays in diagnosis and an increase in serious complications [25].

OYUN refers to a variety of diseases that affect the heart and blood vessels, leading to an increase in infant mortality [24]. The prevalence of GAMES in children is regional. Acquired heart defects in Nigeria range from 28.1% to 68% [26.27.28]. The distribution of different types of GAMES varies in geographical regions and even in a single geographical region. Four to five decades ago, rheumatic heart defects were the leading type of heart defects acquired worldwide, but this trend has changed with the improvement of living standards, the invention of new antibiotics, and improved access to health facilities (report of the World Health Organization expert council, Geneva, October-November 2001).

In the United States, an increase in the proportion of Kawasaki disease has been reported with a decrease in rheumatic heart defects [28]. In developing countries, rheumatic heart defects were also the most common disease, but in these countries there has been a declining trend in rheumatic heart defects in recent years [27].

Despite the development of world medicine, heart failure continues to increase. Major medical advances for patients with heart failure have been announced for more than two decades, and a number of treatment options have been developed to prevent or delay its onset. However, to date, many methods have been used primarily for experimental research only [20].

The successful surgical practice of TYuNs improves the longevity of newborns [31]. Malnutrition is common among children with TYuN [32,33,34,35]. Energy exchange plays a key role in a child's growth, and a disturbed metabolic balance leads to a deviation from the normal growth pathway. Studies have shown that in children with TB, a few weeks after a successful recovery from a heart attack, their overall and energy expenditure normalize, leading to a rapid improvement in growth [27]. However, this "growth" after TYuN occurs only in some patients [24], but growth determinants have not been identified in current studies [19, 20, 21]. The association with parental height increase increases the risk of congenital heart defects [21].

### Conclusion

Congenital diseases of the cardiovascular system are usually diagnosed at an early age and immediately become the focus of the cardiologist, if necessary. Acquired cardiovascular disease can occur at any age - as a result of adverse effects on his body. But in both cases the anthropometric parameters change. The process of growth and development is a key feature of childhood. The study of the laws of development, the creation of methods for its practical management, the normal development or, more precisely, the optimal development of children is one of the main parts of pediatric science and medical practice.

When reviewing data from the available literature, we did not come across any data devoted to the study of anthropometric parameters of the body of children with various heart defects. There are no data on morphometric parameters of anthropometric data of children with various heart defects before and after

surgery. All this requires a detailed study of this problem.

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