

# Research of Adaptive Mechanisms of System of Circulation of Blood for Children in the Conditions of Southern Priaralie

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**Abstract:** *In the article the results of research of the functional state of the cardiovascular system are examined for children resident in the conditions of Southern Priaralie. Intercommunication of physical development and functional descriptions of the system of circulation of blood is shown for the children born and resident in the region of Southern Priaralie.*

**Keywords:** Southern Priaralie, child's population, physical development, cardiointervalgraphic, cardiovascular system

## 1. Introduction

Physical development of children and teenagers is presently studied in different directions and the problem of research of her features continues one of actual to remain in the unfavorable ecological terms of residence, for example in Southern Priaralie.

The study of the state of functional indexes of children and teenagers in the different geographical zones of region of Southern Priaralie in a positive plan will provide more wide approach of the systems in organization of prophylactic work on maintenance of health of population.

Study of adaptation reactions of organism of children, determined by possibility at to nosology level to diagnose and forecast development of illness and more successful to conduct prophylactic and health events [1, 2]. As is generally known, the age-related changes of cardiac rhythm comport with data that a height and development of organism are accompanied by forming of regulator mechanisms and strengthening of holinergeral influences on the cardiovascular system. Adjusting of circulation of blood is provided by cooperation of local гуморальных mechanisms at active voice of the nervous system and sent to optimization of correlation of blood stream in organs and fabrics with the level of functional activity of organism. The parafunctions of the cardiovascular system on the whole can be caused by affecting of various pathogenic factors heart, arteries, capillaries and veins, and also on circulatory in them blood directly or it is mediated through нейрогуморальные mechanisms.

## 2. Materials and Methods

Therefore different parafunctions of the vegetative nervous system, ductless glands, and also synthesis and converting into the organism of different physiological active substances cause violation in the system of circulation of blood. In the real research we applied the method of cardiointervalgraphic for determination of reserve possibilities and functional activity of the cardiovascular ksystem and types of her adjusting depending on sex and age of the inspected children born and resident in Southern

Priaralie. Realization of cardiointervalgraphic allows to judge not only about initial vegetative tone but also about vegetative reactivity and vegetative providing of activity of child's organism in the age-related aspect. Vegetative reactivity characterizes an orientation and degree of change of indexes, reflecting the state of the vegetative nervous system in the moment of transition from one state in other.

The vegetative providing of activity reflects possibility of maintenance of optimal level of functioning of the vegetative nervous system at the different situations of loading character. Determination of initial tone, reactivity and providing of activity allows with greater plenitude to judge about the state of the vegetative nervous system - major link of reactivity of child's organism on the whole. It is important to mark that cardiointervalgraphic is not a specific method in regard to diagnostics of one or another disease. At the same time, the mathematical analysis of sine cardiac rhythm allows to get objective state information the heterospecific mechanisms sent to maintenance of homoeostasis. In this plan cardiointervalgraphic can be examined, as an universal method of functional research.

## 3. Results and Discussion

It is known that already in the early age-related period marked the most low level of functioning of organism at the most degree of tension of scray mechanisms, high activity of sympathetic link of the vegetative nervous system and central contour of adjusting of rhythm of heart. Such adjusting are imperfect and hide in itself the danger of overstrain and blowing off adaptation with development of pathological process. Presumably, it is one of reasons of susceptibility of children of early age to the different diseases.

For boys in age 6-7 a mean value Mo is 0,88 cut, for girls 0,85 sec. 32,08% makes Indexes of amplitude of fashion of amplitude of fashion (AF) for boys, for girls 31,09 %, that some higher than norm ( $27,0 \pm 1,0$  %). Index of DX at a norm  $0,23 \pm 0,25$  second for the boys of this age-related group 0,35 second, for girls 0,32 second that makes also higher than norm. All of it grounds to suppose that the children of this age-related period (6-7 year) have the

maximally expressed sine arrhythmia, that it is constrained, presumably, with predominance of vagues and holinergical influences on the operation of heart. We will mark that all these changes took place on a background the increase of R - R of intervals (there are mean values of these indexes) with age of inspected.

It is set on the basis of the conducted analysis, that in the age-related group 8-10 mean quadratic deviation of mean value of interval of AF makes for the boys of  $0,14 \pm 0,6$  ед., girls have  $0,05 \pm 0,005$  units.

Indexes of value of fashion of interval of R - R for boys made  $0,88 \pm 0,04$  sec., while for girls some below  $0,73 \pm 0,02$  sec. At the same time amplitude of fashion of AF for boys was observed some below (32,0% are 86 persons), than for the girls of the same age-related group (44,0% - 118 mans). Variation of cardioinervalographic of relatively mean value of this index (about character and size of dispersion in this methodology judge by value  $DX = R - R$ ) changed.

So, the results of analysis showed that in the group of boys 6-7 year this index made  $0,34 \pm 0,03$  sec., and in the age-related group 8-10 year made  $0,25 \pm 0,03$  sec. At the same time for girls this index diminished from  $0,22 \pm 0,02$  to  $0,18 \pm 0,02$  cut in the same age-related groups.

Thus, a general tendency demonstrates the relative stabilizing of the age-related changes of R - R both for boys and for girls. Thus gradient of change of R - R of intervals for girls was below than this index, what for boys (gradient of R - R of girls - 0,05 sec, boys - 0,09 sec), almost on 50%, and the gradients of changes of indexes of cardio-rhythmogram prevailed for boys.

From data of specialists, there is alteration of adjusting of cardiac activity in ten year age, there are an increase of centralization of management and predominance of tone of the sympathetic nervous system [3, 4].

It confirms our undertaken study. Undertaken studies testify to intercommunication of physical development and functional descriptions of the system of circulation of blood for the children born and resident in the region of Southern Priaralie.

So, it is set that index of DX, reflecting activity of the vagal adjusting of heart, with age diminished both for boys and for girls. It, as is generally known, in turn, causes tension of mechanisms of adjusting of the cardiovascular system.

For all inspected children of the age-related groups considered by us a sine rhythm is subject to the very considerable vibrations. From data our the researches, increase of indexes of amplitude of fashion (AF), index of tension (IT), reduction of DX specifies on hyper simpatico tonic reactivity in an organism for the inspected children. It testifies to tension of adaptation-scray mechanisms of adjusting of work of heart for the inspected children. Presumably, a substantial value has an influence, as physical activities, психоэмоциональные affecting such factors child of and other.

Thus, the obtained data comport with the results of research of specialists [5] and ground to suppose that the system of circulation of blood for children very perceptibly reacts on unfavorable ecological factors in Southern Priaralie, the same, reducing their adaptation possibilities and assists forming of terms for development of diseases.

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