

GENDER FEATURES OF BIOCHEMICAL AND IMMUNOLOGIC INDEXES OF ORAL LIQUID OF CHILDREN AT THE AGE OF 14–17 YEARS WITH THE DIFFERENT LEVEL OF GARMONIOUSNESS OF PHYSICAL DEVELOPMENT

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With the purpose of exposure of conformities to law between the value of row of biochemical and immunological indexes of mouth liquid and level of harmoniousness of physical development of child 168 children were inspected in age 14–17, constantly resident on territory of the city of Tver and student in the general schools located in different boroughs. All inspected children divided on sex and on the level of harmoniousness of physical development. The level cortisol was studied, DHEA, potassium, natrium, calcium, magnesium, phosphorus, secretory ig A in a mouth liquid. We conducted the analysis of features of biochemical and immunological indexes of mouth liquid of children with harmonious and disharmonious physical development. For an analysis were used non-parametric statistical method of comparison of two selections Whitney and grade cross-correlation analysis of Spirmen. Interesting appeared, that circumstance, that the similar reliable are Interesting appeared, that circumstance, that similar reliable correlative connections are for boys with harmonious development and for girls with disharmonious development. Alike, that for girls the disbalance of sexual hormones is guilty in disharmonious development.

Keywords: children, teenagers, formation of health, level of harmoniousness of physical development, oral liquid

An important index in the complex estimation of health of child is harmoniousness or disharmoniousness of his physical development.

Physical development of child is estimated usually by comparison of his individual indexes with the age-related standards. It is thus important to not only decide a question about accordance of length and body weight, circumferences of thorax and other indexes to age of child but also specify, as far as his development is harmonious. For the children of school age these indexes it is necessary to estimate taking into account biological maturity.

For the estimation of physical development of children different methods were used – indexes, sigmalnykh rejections, scale of regression, tsentil. However, the method of indexes is confessed by useless for the estimation of physical development of growing organism, as it is set that the separate sizes of body of child increase unevenly, and, anthropometric indexes change disproportionate. Method of sigmalnykh rejections and scale of regression are based on supposition, that the investigated selection corresponds to the law of normal distribution, although research of forms of distribution of row of anthropometric signs (body weight, circumference of breast, muscular force of hands of and other) specifies on their asymmetry more often right-side. Therefore, the borders of sigmalnykh rejections can be artificially set too high or understated, distorting a veritable estimation.

Tsentilny a method is unreserved character of distribution of variants. He is simple

in process, because at the use of tsentilnykh tables or charts calculations are eliminated. Two-dimensional centile scales “length of body is body weight”, “length of body is a circumference of breast”, in that mass and circumference of breast settle accounts on due length of body, allow to judge about harmoniousness of development.

At the individual estimation of physical development, determine the level of sign according to his regulations in a centile row. Five groups in this case estimate length of body (as well as body weight). Indexes getting in 25–75 tsentil, it is necessary to consider middle, in 10–25 – low middle, in 75–90 – hi middle, in 3–10 – subzero, in 90–97 – high. At accordance of mass bodies, circumferences of breast, are long and bodies are long it is talked about harmonious physical development.

Materials and methods of research

We surveyed 316 of teens (ages 14–17 years old) were divided into Group of comparison by gender (girls, boys) and degree of harmonious physical development (harmonious, disharmonious). Studies were conducted based on clinical-diagnostic laboratory UNIVERSITY clinics (lab code in the registry FSBOK: 10319, license № FS-69-01-000780 from 23.04.2015 g.) on automatic biochemical Analyzer Flexor XL (Germany, 2012) using commercial kits of reagents for clinical diagnostic laboratories company “Vital” (Russia). Potassium-turbidimetričeskim method without deproteinizacii, sodium-colorimetric enzymatic method kinetic colorimetric method, calcium with Arsenazo III, magnesium-colorimetric (blue ksilidilovyj) method without deproteinizacii, phosphorus-UV method without deproteinizacii.

Determination of cortisol, DHEA in mixed saliva carried out by steadily immunosorbent assays (ELISA) at

mul'tidetektore 1100 Zenyth (Austria, 2005) with sets of reagents firm "HEMA" (Russia).

Determination of secretory immunoglobulin A and avidness secretory immunoglobulin A in two parallel samples were did by steadily immunosorbent assays using a set of reagents "sIgA-Elisa-best".

In one of the samples added urea solution (0,3 mol/l), which destroys the fragile immune complexes. Avidness antibodies was evaluated using the calculated index avidness index, which is the ratio of the enzyme result for determining the concentration of antibodies in the sample were subjected to processing of urea, to the result of the measurement of the concentration of antibody in a sample, urea is not processed. The definition of avidness is the differentiation of high and low avidness antibodies. Avidness characterizes the adhesive properties of antibodies.

For statistical data processing software package was used "Statistica 6". Statistical analysis included computation of descriptive statistics and data analysis for normality of the distribution, the investigation of relationships between the parameters and the comparison groups. Differences were considered significant when p groups $< 0,05$, where p is the level of significance.

Results of research and their discussion

Analysis descriptive the statistician of biochemical and immunological parameters in the mouth liquid of teenagers by comparison to the reviewer indexes of the studied parameters showed that the scope of vibrations of values of indexes of cortisol and DHEA (from minimum to maximal) for girls is considerably higher.

Maybe it related to their greater emotional label and feature of hormonal background. The mean values of DHEA for girls are higher than refrentnykh values of norm, minimum values both for girls and for boys below than refrentnykh values, and maximal values for girls sharply exceed the abstract borders of norm. Mean values of indexes of potassium, calcium and magnesium in a mouth liquid both for girls and for boys below than refrentnykh values, and natrium – higher. Maybe it related to the

ecological features of place of residence: water, food, features of feed and ecology of place of residence.

In order to judge the veracity of differences between groups, it was necessary to conduct an audit of the data on the normality of the distribution. Data validation on the normality of the distribution was carried out. It was revealed that most of the parameters is not a normal distribution. So for the analysis were used nonparametric statistical methods, in particular, when comparing two samples used U-Mann-Whitney test.

So when comparing two samples, with harmonious and disharmonious physical development has been a trend to differ ($p = 0,0896$) boys on the avidity of the secretory immunoglobulin a, but the girls a trend toward excellence by magnesium ($p = 0,077$).

Macro element composition of saliva very depends on composition of the used food and amount of the drunk liquid, from the state of gematosalivarny barrier and from maintenance of microelements in the serum of blood.

The decline of magnesium in saliva similarly can testify to propensity to the obstruction or at the presence of irritating the mucous membranes of harmful admixtures in an atmosphere [3].

In respect of pregnetrioldione and DHEA, then it needed in every special case to understand individually: to know both weight and degree of stability to stress of child etc. It was desirable to add in future psychological tests for the inspection of children. Determination of DHEA replaces determination of 17 – KS in urine at the estimation of making of androgens. In the ovaries of synthesis DHEA does not take (a test is used therefore for determination of source of giperandrogenemiya in the organism of woman) place.

Results of researches of parameters of mouth liquid of children 14–17

Index	Group of children with harmonious physical development		Group of children with disharmonious physical development	
	Boys $n = 61$	Girl $n = 55$	Boys $n = 79$	Girl $n = 121$
cortisol	$1,8 \pm 0,3$	$1,96 \pm 0,3$	$1,6 \pm 0,2$	$3,3 \pm 0,6$
Dehydroepiandrosterone (DHEA)	$0,7 \pm 0,05$	$1,04 \pm 0,1$	$1,1 \pm 0,2$	$7,6 \pm 6,6$
potassium	$7,2 \pm 0,3$	$6,9 \pm 0,3$	$7,6 \pm 0,3$	$7,3 \pm 0,2$
natrium	$33,2 \pm 2,6$	$38,1 \pm 3,0$	$38,2 \pm 2,6$	$33,2 \pm 1,7$
calcium	$0,55 \pm 0,05$	$0,6 \pm 0,04$	$0,7 \pm 0,08$	$0,6 \pm 0,04$
magnesium	$0,3 \pm 0,02$	$0,32 \pm 0,03$	$0,3 \pm 0,02$	$0,27 \pm 0,02$
phosphorus	$2,9 \pm 0,2$	$2,8 \pm 0,3$	$3,3 \pm 0,3$	$3,2 \pm 0,2$
sIgA A	$167,9 \pm 24,1$	$163,1 \pm 27,6$	$156,2 \pm 20,7$	$184,3 \pm 19,5$
Avidness sIgA A	$63,4 \pm 2,8$	$74,9 \pm 2,3$	$70,9 \pm 2,1$	$76,5 \pm 1,5$

High avidness of sIgA can testify or about a chronic hearth in an epipharynx and adhesives properties of antibodies are high (antibodies ripen “quickly”, because constantly microorganisms remind about itself). High avidness of secretory antibodies A can testify and about propensity to the allergic reactions, (the best terms are created for sensitization of organism allergens).

It appears us, that a study of correlative intercommunications of biochemical and immunological indexes at different diseases and states of organisms is not only concrete recommendations for practice but also new going near understanding of adjusting of homeostasis and new perspective ways of management by metabolism.

We carried out rank-order Spearman correlation analysis, the result revealed a General authentic correlative connection of different forces, but are peculiar to girls and boys, and with harmonious and disharmonious development. Is a cortisol, potassium, cortisol, secretory immunoglobulin a, and DHEA – magnesium, secretory immunoglobulin A – phosphorus, secretory immunoglobulin A – potassium, potassium – phosphorus. Identify and respect unique to a specific group of girls or boys (harmonious or disharmonious physical development). It reliable correlations in boys and girls with disharmonious development much more than the general correlative relationships among boys and girls with a harmonious physical development. Interesting seems the fact that you have a similar authentic correlative connection that boys have with a harmonious development in girls with disharmonious development (cortisol – phosphorus, secretory immunoglobulin A – sodium, cortisol – DHEA), and girls with harmonious development and boys with disharmonious development of such pattern is not detected. It seems that in disharmonious development in girls caused by an imbalance of sex hormones.

Conclusion

Given that saliva is a biological material, work which started recently and the concentration of substances in it are subject to very large fluctuations, therefore, to interpret the results of biochemical studies it is necessary not only among themselves but also in correlative relationships with clinical data and instrumental data survey. Through every living organism constantly passes a stream of various substanc-

es involved in metabolic processes, and emissions into the environment in the form of products of metabolism. This flow of substances the body and maintains its existence [1]. The lack of minerals in the diet forces the body to use its reserves, which are in the body tissues. Assimilation of minerals depends on their relationship and interaction with each other [2].

Regulatory mechanisms to ensure the preservation of life of the whole organism, called homeostatic [3]. The central mechanism for implementation of the recovery process of homeostasis are all sorts of barriers. Conventionally distinguish internal and external barriers. External barriers to protect the body from physical and chemical changes in the environment. They prevent the penetration of microorganisms, toxins, and provide disposal and removing them from the body.

Internal barriers regulate the inflow of blood to the organs and tissues necessary substances, and the outflow from the tissue cell metabolism products. The structural nature of the barrier histogematogenous up the endothelium, basement membrane, a basic substance and nerve fibers. Under the conditions of normal lifeblood of their dynamic balance supported by external barriers. Endothelial dysfunction is one of the major pathogenesis mechanisms of many diseases and pathological conditions, especially cardiovascular system.

The study of endothelial function as a model of the cell membrane is possible by examining its permeability in various pathological conditions to determine the concentration of the substances on either side of the membrane [4, 5]. In clinical practice, a certain perspective is the study of gematosaliva's barrier function. It seems that expressed earlier hypothesis [3] on the existence of a close link between saliva and blood, and that the balance shifts in blood at the cost of violation of saliva biochemical balance is confirmed in the analysis of our data.

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