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VITAMIN D INSUFFICIENCY IN CHILD POPULATION OF THE AMUR REGION

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Abstract Currently, the scientific literature has increased its interest in vitamin D. Over the last 50 years has published more than 60 thousand articles on the topic have been published.

The role of vitamin D in regulation of calcium - phosphorus metabolism in the body is widely known in understanding of the doctor associated with impact primarily on the osteo-articular system and using it for prevention/treatment of rickets in children of the first year of life [2,7,9]. In recent years, were convincing data on the role of vitamin D in many biological processes were discovered and collected. Hormonally active forms of vitamin D, namely calcitriol receptors, found in 40 different tissues of the body, where they carry out the regulation of processes of growth and differentiation of cells, prevent their excessive proliferation and control the synthesis of hormones [1,2,8,9]. Deficiency of this vitamin is associated with the risk of development of autoimmune, inflammatory, oncological diseases, arterial hypertension, myocardial infarction, diabetes mellitus, obesity. It is proved that the normal security uncostly effects of this vitamin in the body need the content of 25(OH)D above 30 ng/ml. [1,6,7,8,9].

It is now known that 30-50% of the population living in Russia, and the United States, is in a state of vitamin D deficiency [1,2,4,6,8,9].

Purpose— to study the availability of vitamin D in children of different ages in the Amur region.

Key words: vitamin D, cholecalciferol, hypovitaminosis, deficiency, vitamin D insufficiency, risk factors.

The materials and methods. The Department of Pediatrics sbei HPE Amur state medical Academy MZ of the Russian Federation in 2014 was organized by the research assessment provision for children from birth to 3 years, 3-6 years, boys 15-17 years of vitamin D in the Amur Region. Study on the identification of D-deficiency States in children began in November 2013 and March 2015. Criteria for inclusion of patients in the study: healthy children, age (from birth to 3 years, 3-6 years, 15-17 years) residing in the Amur region. Exclusion criteria: rickets, mental disorders, disorders of hepatic function and renal function. The content of the metabolite of vitamin D [25(OH)D] in blood serum was determined by high-performance liquid chromatography analyzer Liason Dia Sorin Pleutschland GmbH Germany, sn - 22290044. The vitamin D took the level of 25(OH)D=30-100

ng/ml, insufficiency-20-29 ng/ml; deficiency of" 20 ng/ml [1,2].

The obtained results were statistically processed with the use of applied programs Statistica 6.0. The results are presented as mean values and standard errors of the average value ($M \pm m$). To assess the differences between groups used the χ^2 criterion. The criterion for statistical significance level was $p = 0.05$.

The results and discussion. In the group of 129 healthy children from 1 month to 3 years divided into sub-groups (1 to 6 months) 48 children from 6 to 12 months. (27 children), 26 children of the second year, 28 children in the third year of life. Among the 48 children (1-6 months)-24 child was breast-fed, 24 - bottle-fed. In children receiving breastfeeding average 25(OH)D equal 34.12 ± 4.9 ng/ml. Vitamin D in the normal range were detected in 11 (45,8%), insufficiency in 6 (25%), the deficit in 3 (12,5%) expressed as a deficit - in 4 (16,6%). In children receiving artificial feeding, the average level of 25(OH)D was 41.7 ± 3.3 ng/ml, figure calzidiola in the normal range - was in 11 (45,8%), his failure was detected in 6 (25%), the deficit - in 5 (20,8%), a marked deficit in 2 (8,3%). Verify the existence of differences in the level of cholecalciferol in children, breast or bottle-fed using the criterion Kruskal-Wallis test showed $N_{amp}=1,679$ $p=0,432$, indicating no significant differences concerning the level of vitamin D in children with different types of feeding. Overall, in the group of children from birth to 6 months vitamin D levels equal $32,54 \pm 0f 3.24$ ng/ml In the subgroup from 6 to 12 months, the average level of 25(OH)D was slightly higher of $39.75 \pm 5,36$ ng/ml, while in the normal range - 14 (51,8%) children, D-insufficiency - in 6 (22,2%) children, the deficit in 5 (18,5%), a marked deficit in 2 (7,4%) children. 26 children from 1 year to 2 years level of 25(OH)D is reduced to 24.10 ± 3.6 ng/ml, while normal levels was observed in 4 (14,%) , failure was observed in 9 (34.6 per cent) children who are deficient in 8 (30,8%), a marked deficit in 5 (19,2%). In 28 children with 2 to 3 years of age the level of 25(OH)D made up of $19.31 \pm 14,68$ ng/ml, normal content was observed in 1 (3,6%) patients, insufficiency revealed - in 13 (46,4%) children who are deficient in 11 (39,3%), while 3 patients (10.7%) of significant deficiency. Vitamin D levels in children whose mothers took vitamins during pregnancy was statistically significantly higher than children of mothers not taking the vitamins ($N_{emp}=43,023$ at $p < 0.001$). In the structure of the identified risk factors (RF) for the development of vitamin D deficiency among children from 1 month to 3 years: maternal age older than 25 years, gestosis of the 1st and 2nd half of pregnancy ($p < 0.001$); prematurity ($p < 0.001$); 3 or more genera on account ($p < 0.05$); the pathology of bones and joints (PLANO foot, varus and valgus deformity of the lower limbs, deformity of the skull and chest)($p < 0.001$); pathology of the respiratory tract (respiratory infection, bronchitis, sinusitis, laryngotracheitis, pneumonia, rhinitis) ($p < 0.001$). Overall, in children during the first 3 years of life decreases with age the proportion of normal vitamin D at 12.7 times, increasing its deficiency in the deficit of 1.9 and 1.7 times.

In the formation of insufficiency of 25(OH)D in children 3 to 6 years among biological PHR of great importance are identified in children diseases such as pathology of the digestive tract (chronic gastroduodenitis, pancreatopathy, goiter)-36,6% ($p < 0.001$); ORI and diseases of respiratory system (pneumonia, bronchitis, laryngotracheitis, sinusitis, rhinitis) to 68.3% ($p < 0.05$), cardiovascular system - in 16.6% ($p < 0.001$).

In the study, 60 healthy adolescents aged 15-17 years, it was revealed that 7 of them (11,6%) level of 25(OH)D were in the normal range in 39 (65%) showed vitamin D insufficiency, deficiency of 25(OH)D determined at 14 cadets (23.3 percent). The average 25(OH)D of all studied made up $23.89 \pm 0,66$ ng/ml, i.e., is below the criterion standards.

The analysis of the DF contributing to the formation of low vitamin D level boys cadets: virus - bacterial infection of the respiratory tract (frequent respiratory infections more than 4 times during the school year, bronchitis, sinusitis, laryngotracheitis, pneumonia, rhinitis)- 64,1% ($p \leq 0,001$); vegetative-vascular dystonia (VSD) was observed in 35 (66%), which was manifested by complaints of headache in 17 (32%) boys, arterial gipertenzii 1 degree in 2(3,7%) adolescents, sleepiness during the day and hypotension in 6 (11,3%), dizziness in 4 (7,54%), irritability in 7(13.2%), and 33 subjects(62.2%) showed red dermographism; diseases of the gastrointestinal tract (chronic gastroduodenitis without exacerbation, a dyskinesia of biliferous ways, pancreatopathy)- 50,94% ($p=0.023$).

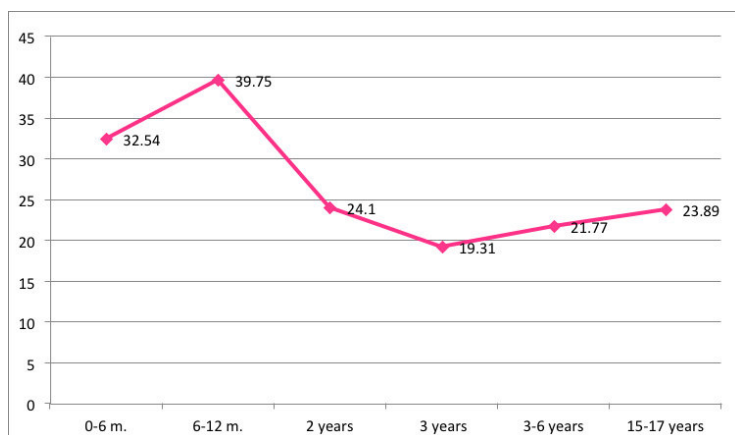


Figure 1. The change in 25(OH)D in the blood plasma of the examined contingent, depending on the age

Obtained in the course of the study, the results indicate a decline in vitamin D since 2 years, all age groups of the population. (Fig.1). The lowest levels of 25(OH)D in the organism identified in children 3 years of life with the average value was $19.31 \pm 1,0$ ng/ml and in children 3 - 6 years - $21,77 \pm 0,96$ ng/ml. the largest risk group for the development of deficiency (hypovitaminosis) were children 1 month.- 3 years - 36,4%, ie every 3rd child.

Conclusion: the Obtained during research results indicate a high frequency of failure and vitamin D deficiency in a group 3 years of life (92,43%), children aged 15-17 years (88,4 %) and 2 years of life (for 84.7%). The highest calzidiola found in the group of healthy children 3-6 years (56.6 per cent), slightly less in children from birth to 6 months (45,8%). The increase in the degree of accuracy with age in the development of vitamin D deficiency and to predict FR in the group have young children, allowing you to include this criterion as predicting factors for having children in the first 3 years (Fig.1).

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VITAMIN D INSUFFICIENCY IN CADETS OF THE AMUR REGION

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Abstract Nowadays, the lack of sunshine vitamin D is associated with rickets in children and osteoporosis in adults. Recently, however, new data on the physiological role of cholecalciferol and the relationship of its deficit with numerous diseases (immune system, cardiovascular, oncological, neurological, etc.) were received. This paper presents the analysis of the results of the study of vitamin D metabolites in serum of healthy adolescents, training on the basis of the Amur Cadet Corps, residing in the territory of the Amur region. Risk factors for development of vitamin D deficiency were identified and the adequacy of preventive measures was assessed. A study to identify D-deficient states of conditionally healthy adolescents in the Amur region began with the December 2014 and March, 2015. The article presents the first results of studies indicating a high frequency of deficits of varying severity of vitamin D in healthy adolescent boys in the Amur region. Currently the principles of prevention and optimal methods of correction of low vitamin D status in adolescents are not developed. These results allow to speak about necessity of revision of existing methodological recommendations taking into account modern approaches to the prevention and treatment of deficiency with different degrees of severity of vitamin D in children and adolescents.

Key words. Vitamin D, cholecalciferol, hypovitaminosis, deficiency, vitamin D insufficiency, adolescent boys, cadets, risk factors.

Introduction. In the scientific literature has dramatically increased the interest in solar vitamin D. Over the past half century was published more than 60 thousand articles on the subject. Not more than 30% of physiological needs vitamin D enters the human body. To prevent the effects of D-deficiency condition is a necessary and timely prevention and treatment of vitamin D deficiency, so additional applications of farmpreparatov vitamin D throughout life is necessary. Up to the present time vitamin D was associated within the meaning of the doctor effect on bone-joint system and for the prevention/treatment of rickets in children the first year