

Prevention of rickets depending on the level of 25 (oh) d in the serum of koi in children 1 year of age in uzbekistan

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ABSTRACT: In the article, data on the effect of prophylaxis of rickets in children at level 25 (OH)D in serum in Uzbekistan are considered. Under the supervision were 466 children, aged 1 to 12 months, whom the parents considered almost healthy and the children did not receive vitamin D for a month before blood sampling. Children with 25(OH)D3 less than 30 nmol/l were considered as existing biochemical deficiency. Despite the traditional prevention of rickets from 466 children, 27,8% had a mild and moderate severity, then 72,1% did not have clinical signs of rickets. 86,1% of children with rickets had a low serum level of 25(OH)D3. Therefore, after a modified prophylaxis of rickets, only in 9,2% of the examined children with signs of rickets, the level 25(OH)D3 remained low, while in 90,7% it returned to normal. In children with no signs of rickets, 14,3% showed a low content of 25(OH)D3 in the blood serum, and in 85,7% children it returned to normal. As a result, the proper administration of vitamin D can reduce severe forms of rickets, improve the child's psychomotor development.

KEYWORDS: rickets, 25(OH)D3 in the serum, prevention.

INTRODUCTION

The urgency of the problem. Rickets belongs to the group of deficient diseases, the main etiological factor of the development of which is insufficient intake of food or the formation of vitamin D

in the skin in growing children [2]. This problem has been dealt with for decades, but the frequency of rickets does not tend to decrease and averages 30% [4,5]. Despite the abundance of the sun in our country, rickets is widespread. In Uzbekistan, rickets occurs in 27% of children 1 year of age [6]. This dictates the need to develop and improve methods of its prevention, taking into account current situations, environmental and ethnic characteristics. However, its deficiency has always been determined indirectly by the content of Ca and P. At the same time, the content of Ca and P does not always accurately reflect the severity and clinical manifestations of rickets and, according to [1,3], manifestations of rickets can also be with normal Ca and P in the blood. Studies to determine the active metabolite of vitamin D, which is a direct indicator of deficiency, have not been conducted in Uzbekistan.

Purpose of the work: determination of the level of 25 (OH) D3 in blood serum and its effect on the prevention of rickets in the conditions of Uzbekistan.

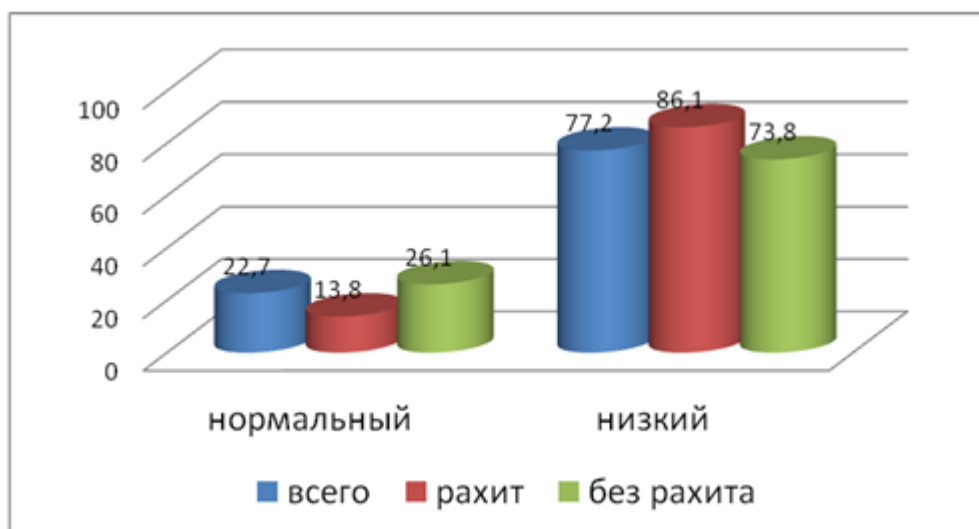
Material and methods of research: The study included 466 children, aged 1 to 12 months, whose parents considered them to be practically healthy and did not receive vitamin D for a month before blood sampling. Children under the age of 6 months were 35.6%, up to 12 months - 43.7%, up to 3 months - 20.6%. The predominance of boys was noted - 258 ($55.3 \pm 2.3\%$), while the number of girls was 208 (44.6 ± 2.3). Determination of 25 (OH) D3 in blood serum was carried out in the laboratory of the Santa Clara Hospital, Rotterdam, Holland by radioimmunoassay. 2 ml of venous blood was taken from each child. The serum was separated by centrifugation at 3000 rpm for 10 min. and stored at a temperature of -200°C . Children with 25 (OH) D3 less than 30 mmol / L were considered as an existing biochemical deficiency.

Results: We found that vitamin D deficiency occurs in 77.2% of children, including clinically pronounced rickets in 27.8% of children of the 1st year of life, which indicates insufficient effectiveness of traditional methods of rickets prevention. It is known that the effectiveness of measures to prevent the disease significantly depends on the timeliness of prophylactic administration of vitamin D3 preparations, taking into account the degree of adverse effect of risk factors on the child's body. Considering the fact that, despite the recommendations of the district pediatrician about giving vitamin D3, on the one hand, and the mandatory implementation of the doctor's recommendation by the parents, on the other hand, the children we observed had signs of rickets.

According to the questionnaire data, we found that during the standard prophylaxis of rickets, out of the total number of children, only 128 children (27.4%) received vitamin D. It should be said that the local doctor prescribed vitamin D by prescribing, but the mother forgot to give the child vitamin D every day.

It was found that, despite the traditional prophylaxis of rickets, out of 466 children, 27.8% had mild and moderate severity, while 72.1% had no clinical signs of rickets. In 86.1% of children with rickets, a low level of 25 (OH) D3 in the blood serum was detected, while in the rest they fluctuated within the normal range. Paradoxically, in 73.8% of children without signs of rickets we also found a low level of the main metabolite of vitamin D (Fig. 1).

Apparently, this was due not only to the lack of preventive measures, but also to the peculiarities of the lifestyle and nutrition of children and their mothers. In 22.7% of children, the level of 25 (OH) D3 in the blood serum was within normal limits, of which 26.1% had no signs of rickets, and 13.8% had signs of rickets.



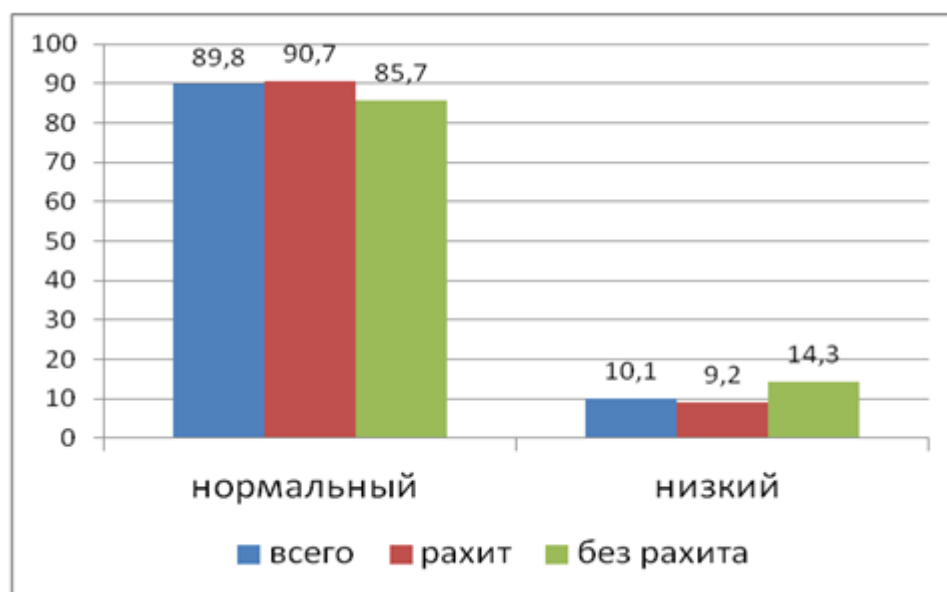
Drawing 1. Level 25(OH)D3 in blood serum in children at the time of the traditional prevention of rickets

It was found that despite the ongoing traditional prevention of rickets, its effectiveness remains low, as evidenced by the high incidence of rickets and the low level of 25 (OH) D3 in the blood serum of children. In our opinion, constant employment of mothers and inadequate implementation of preventive measures by mothers are also of great importance.

In this regard, we decided to modify the intake of vitamin D, and assign all responsibility for the modified prophylaxis to the visiting nurses.

This was due to the fact that daily intake of vitamin D is inconvenient, and at times, parents simply forget. In this regard, to increase the reliability of the prophylaxis, it was decided to change not only the scheme, but also the method of administration of this drug. Analysis of the children's condition proved the truth of our assumption. In this regard, for 3 months, all children were given vitamin D directly by the local nurse according to the following scheme: vitamin D (aquadetrim, Devaron), 4000 IU once a week from one month of age to the end of the 1st year of life with the child's patronage supervision (course dose 160,000-180,000 ME).

It should be said that the modified prophylaxis made it possible to normalize the serum 25 (OH) D3 level in 89.8% of children. 82.2% had initial rickets and rickets of the peak period, 17.7% had no clinical signs of rickets (Fig. 2).



Drawing 2. Level 25(OH)D3 in blood serum in children with modified prophylaxis of rickets

Studies have shown that, after the modified prophylaxis of rickets, only 9.2% of the examined children with signs of rickets had a low level of 25 (OH) D3, while in 90.7% it returned to normal. At the same time, in children without signs of rickets, 14.3% had a low serum 25 (OH) D3 content, and 85.7% of children had the level normalized.

There was an improvement in the child's well-being, normalization of appetite and sleep, cessation of profuse sweating during feeding, and improvement in body weight gain. The general condition of the children during the examination after the course of preventive measures was satisfactory. We did not reveal the development of side effects and overdose from the drug used.

It should be noted that during the traditional and modified prophylaxis of rickets in the city of Samarkand and the Akdarya region, they showed their results. In Akdarya region, rickets was found in children in 56.7% of cases, and in Samarkand - 28.5%. At the time of the study, we determined the level of 25 (OH) D3 in the blood serum of children depending on the place of residence.

The data obtained showed that in the Akdarya region the low level of 25 (OH) D3 in the blood serum of children with signs of rickets was 80.2%, and the normal level of 25 (OH) D3 in the blood serum was 19.7%. In Samarkand, a low level of 25 (OH) D3 in the blood serum of children with signs of rickets was noted in 82.9%, the normal level of 25 (OH) D3 in the blood serum was 17%.

At the time of the traditional prophylaxis of rickets in the Akdarya region, the serum 25 (OH) D3 level was low in 96.4% of children, and normal - 3.4%. A similar situation was in Samarkand. Low level of 25 (OH) D3 in blood serum in children with signs of rickets was in 80%, normal - in 20% of children.

After carrying out modified prophylaxis according to our proposed scheme, the studies showed a brilliant result.

So in the Akdarya region, the low level remained only in 9.5% of children, while in 90.5% this level returned to normal. In Samarkand, a low level was also observed in 16.6% of children with signs of rickets, and a normal level of 25 (OH) D3 in serum was in 83.4% of children.

Conclusions

Thus, the proposed correction with vitamin D allows us to normalize the level of 25 (OH) D₃, reduce severe forms of rickets, improve psychomotor development in the 1st year of life and can be recommended in Uzbekistan.

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