



OPTIMIZING THE TREATMENT OF RICKETS IN INFANTS

Ibatova Sh.M.,

Ergashev A.Kh.,

Islamova D.S.

Samarkand State Medical University, Republic of Uzbekistan

ANNOTATION

Rickets is not only a pediatric, but also a medical and social problem, as it has serious consequences that cause a high incidence of children. Vitamin D - deficiency rickets is a disease of children caused by vitamin D deficiency in the body, occurring with metabolic disorders, both phosphorus-calcium and lipid, affecting primarily the bone and nervous systems. Improper treatment and prevention of rickets contribute to the disruption of the formation of the skeletal system, a decrease in motor activity, immune defense, a delay in neuropsychic and physical development, and the development of frequent acute respiratory diseases. The examined patients revealed significant changes in the composition of higher fatty acids and the depth of changes in the composition of higher fatty acids depended on the severity of rickets. The revealed violations of the composition of higher fatty acids were corrected with the help of vegetable (apricot) oil and aevit. The results of the use of corrective therapy with apricot oil and aevit for the treatment of children with rickets are presented. The effectiveness of this method of treatment of children with rickets is shown.

KEY WORDS: Vitamin D - deficient rickets, corrective therapy, fatty acids, efficacy, treatment.

INTRODUCTION

Vitamin D - deficiency rickets is a disease of infants and young children (usually from 2 months to 1 year), caused by vitamin D deficiency in the body, proceeding with metabolic disorders, affecting primarily the bone and nervous systems. Rickets is not only a pediatric, but also a medical and social problem, as it has serious consequences that cause a high incidence of children [1-7]. Inadequate treatment and prevention of rickets contribute to the disruption of the formation of the skeletal system, a decrease in motor activity, immune protection, a delay in neuropsychic and physical development, and the development of frequent acute respiratory diseases [8-18].

PURPOSE OF THE STUDY

To correct some indicators of lipid metabolism in rickets in children by the combined use of apricot oil and aevit.





MATERIAL AND RESEARCH METHODS

Studies were conducted in 67 patients with vitamin D-deficient rickets and 10 practically healthy children who made up the control group. In the examined patients, the composition of higher fatty acids in the blood serum was determined by gas-liquid chromatography [14]. Separated methyl esters of fatty acids were identified using the “witnesses” method and the method based on the structural group components “sorbent-sorbate” [7]. As a result of identification, the following fatty acids were found in the blood serum: C (16: 0) - palmitic, C (16: 1) - palmitoleic, C (18: 0) - stearic, C (18: 1) - oleic, C (18 : 2) - linoleic, C (18: 3) - linolenic and C (20: 4) - arachidonic. The content of fatty acids was determined by the method of internal normalization [8,9].

RESEARCH RESULTS AND DISCUSSION

The results obtained for determining the content of higher fatty acids in the blood serum of children with rickets compared with the data of healthy children are presented in Table 1.

Table 1 Composition and content of fatty acids in blood serum in children with rickets

Fatty acids	Control	Examination	P<
C (16:0)	28.17±1.37	30.87±1.53	0.01
C (16:1)	2.70±0.22	1.38±0.64	0.05
C (18:0)	26.13±1.32	28.03±1.04	0.01
C (18:1)	0.90±0.13	0.66±0.6	0.01
C (18:2)	33.32±2.51	29.73±2.34	0.05
C (18:3)	2.41±0.45	2.58±0.50	0.01
C (20:4)	3.56±0.60	2.68±0.60	0.01

Note: P is the significance of the difference between the indicators in the group of patients and healthy people

As can be seen from the data presented in children with vitamin D-deficient rickets, the content of such fatty acids as palmitic, stearic and linoleic increases, while palmitoleic, oleic, linolenic and arachidonic acids decrease, i.e. there are violations of the studied indicators of lipid metabolism, which proves the violation of lipid metabolism in rickets. This dictates the need for correction of lipid metabolism in this pathology with the inclusion of vegetable oils.

To select vegetable oil, we evaluated the digestibility of vegetable oils by the body by the lipase activity of blood serum. The conducted studies showed that the lipase activity of the blood serum in the control group (15 children) was 10.2±3.6 μmol/(l•min). When cottonseed oil was used in the diet, it was equal to – 10.5±4.1 μmol/(l•min) (n=15), no significant change was observed in this group. When giving zeger oil, it was 16.8±4.2 μmol/(l•min) (n=17), sea



buckthorn oil was $18.9 \pm 3.7 \mu\text{mol}/(\text{l} \cdot \text{min})$ ($n=17$), and when when children received apricot oil, the lipase activity of blood serum increased significantly and amounted to $-20.7 \pm 3.9 \mu\text{mol}/(\text{l} \cdot \text{min})$ ($n=18$). From the data obtained, it can be seen that the use of apricot oil leads to an improvement in lipid digestibility by more than 2 times by increasing the activity of blood serum lipase and thereby improves lipid metabolism [10,11].

On the other hand, apricot seeds of various varieties contain 20.5-57.7% fatty oil, 20.6-28.0% protein, 2.8-3.1% mineral salts (potassium, calcium, magnesium, phosphorus, iron etc.) [2,3]. In this regard, apricot oil was used as a substance that corrects impaired lipid metabolism, since it is rich in polyunsaturated fatty acids, has a pleasant smell and taste, has high biological activity and has a beneficial effect on metabolic processes in the child's body [4,12]. Aevit was used as an antioxidant.

The children were divided into 2 groups. I-group of children (38 patients) with rickets received the traditional method of therapy. The results of the study are presented in table 2.

Group II of the examined children with rickets (29 patients) received apricot oil and aevit against the background of the traditional method of treatment. The results of the study are presented in table 3.

A study was made of the composition of higher fatty acids in the blood serum of children with rickets (group I - 38 sick children with rickets) who are on the traditional method of treatment (table 2) and group II (29 sick children with rickets) - with a combination of the traditional method of treatment using modified therapy (table 3).

Table 2 Composition and content of fatty acids in blood serum in children with rickets those on the traditional method of treatment fatty

Fatty acids	Control	Conventional method	P<
C (16:0)	28.17 ± 1.37	28.96 ± 1.28	0.01
C (16:1)	2.70 ± 0.22	$1.62, \pm 0.43$	0.01
C (18:0)	26.13 ± 1.32	27.67 ± 0.82	0.20
C (18:1)	0.90 ± 0.13	0.76 ± 0.10	0.20
C (18:2)	33.32 ± 2.51	30.74 ± 2.10	0.50
C (18:3)	2.41 ± 0.45	2.11 ± 0.45	0.05
C (20:4)	3.56 ± 0.60	2.10 ± 0.51	0.05

Note: P is the significance of the difference between the indicators in the group of patients and healthy people



In the examined children with rickets who received traditional treatment, there was a wide range of fluctuations in the studied parameters of lipid metabolism.

Lipid imbalance is probably due to the fact that the effect of specific therapy in the body is primarily aimed at correcting phosphorus-calcium metabolism, so there was no normalization of lipid metabolism.

Table 3 Composition and content of fatty acids (in%) in blood serum depending on the method of treatment

Fatty acids	Control	Conventional treatment	P<	Modified method of treatment	P<
C (16:0)	28,17±1,37	28,96±1,28	0,01	28,21±1,31	0,1
C (16:1)	2,70±0,22	1,62, ±0,43	0,01	2,55±0,30	0,1
C (18:0)	26,13±1,32	27,67±0,82	0,20	26,75±0,80	0,1
C (18:1)	0,90±0,13	0,76±0,10	0,20	0,92±0,10	0,1
C (18:2)	33,32±2,51	30,74±2,10	0,50	33,12±1,80	0,1
C (18:3)	2,41±0,45	2,11±0,45	0,05	2,73±0,45	0,1
C (20:4)	3,56±0,60	2,10±0,51	0,05	3,26±0,40	0,1

Note: P - relatively healthy

As can be seen from Table 3, the treatment method performed showed its high efficiency, which is confirmed by the data obtained: C(16:0) - 28.21±1.31%, C(16:1) - 2.55±0, 30%, C(18:0) - 26.75±0.80%, C(18:1) - 0.92±0.10%, C(18:2) - 33.12±1.80% ; C(18:3) - 2.73±0.45%; C(20:4) - 3.26± 0.40%, i.e. under the influence of the modified treatment, the parameters of the fatty acid composition returned to normal in the majority of patients.

CONCLUSION

1. It was revealed that the traditional method of treating children with rickets does not lead to the restoration of the metabolism of higher fatty acids in the blood serum.
2. To eliminate the dysmetabolism of higher fatty acids in children with rickets, it is recommended to prescribe apricot oil and aevit, which leads to the restoration of lipid metabolism and ensures high efficiency of therapy in children with rickets.
3. The use of apricot oil in rickets in children leads to an improvement in the absorption of lipids by more than 2 times by increasing the activity of blood serum lipase and thereby improves lipid metabolism.



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