International Journal of Medicine & Health Research

www.advancejournals.org
Open Access Scientific Publisher

Research Article

IMPROVEMENT OF VITAMIN-D DEFICIENT RACHITIS TREATMENT IN CHILDREN

Shoira M. Ibatova[1], Nurali Q. Muhamadiev[2], Shohruh O. Axmedov[1], Sayyora N. Muhamadieva[1]
[1]Samarkand State Medical Institute, Samarkand, Uzbekistan
[2]Samarkand State University, Samarkand, Uzbekistan

Correspondence should be addressed to **Shoira M. Ibatova**

Received August 26, 2015; Accepted September 13, 2015; Published October 19, 2015;

Cite This Article: Ibatova, S., Muhamadiev, N., Axmedov, S., Muhamadieva, S.(2015). Improvement of vitamin-d deficient rachitis treatment in children. International Journal of Medicine & Health Research, 1(2). 1-5

ABSTRACT

Introduction: Significant changes of the highest fatty acids content were revealed in the blood serum in children ill with rachitis. The depth of changes of the highest fatty acids content depended on the degree of the pathologic process severity. The revealed disturbances of the highest fatty acids content was corrected by means of apricot oil and the results of therapy were presented. Efficacy of the presented method of treatment in children with rachitis was shown in optimal doses of apricot oil.

Methods: 67 patients ill with Vitamin-D deficient rachitis and 10 practically healthy children of the control group were enrolled in the study. The 1st degree of the disease was diagnosed in 30 (44,8%) and the 2nd degree in 37 (55,2%) children.The content of the highest fatty acids in blood serum of the studied patients was determined by means of gas- liquid chromatography. For identification of separated methyl aether fatty acids the method of "witness" and "sorbent-sorbat"method based on structural group contents were used.

Results:67 babies were studied. In children with Vitamin-D deficient rachitis the content of such fatty acids as palmitinic, strearic and linolic acids increases and palmitoleinic, oleic, linoleic and arachidonic acids decreases and that is the evidence of lipid exchange disturbance in rachitis. It motivates the necessity to correct lipid exchange in this pathology and to add vegetable oils. In order to eliminate dysmetabolism of the highest fatty acids in children with rachitis it is recommended to administer apricot oil as therapeutic agent.

Conclusion: In order to eliminate the highest fatty acids dysmetabolism in children ill with rachitis it is recommended to administer apricot oil that results in restoration of the highest fatty acids metabolism and provides high therapeutic effect.

KEYWORDS: Apricot oil, efficacy, fatty acids, improvement, rachitis, treatment.

INTRODUCTION

Rachitis is not only pediatric but medicosocial problem as it has severe outcomes resulting in high morbidity of children [3,5]. Inadequate treatment and prophylaxis of rachitis contribute to disturbance of the skeletal system formation, decrease of motor activity, immune defense, delay of neuropsychic and physical development and frequent acute respiratory diseases

development. In rachitis the processes of all metabolic types of disturbances including lipid disturbance [6,10] take place. Its frequency in different regions of the country makes from 35 to 80,6 %. It determines important practical significance directed to fundamental study of rachitis and development of more perfect methods of complex therapy. The aim of the research - Improvement of treatment of Vitamin-D deficient rachitis in early age children.

MATERIALS AND METHODS

67 patients ill with Vitamin-D deficient rachitis and 10 practically healthy children of the control group were enrolled in the study. The 1st degree of the disease was diagnosed in 30 (44,8%) and the 2nd degree in 37 (55,2%) children. Of them 17 children (25,4%) were on natural feeding, 27 (40,3%) on mixed feeding and 23 (34,3%) on artificial feeding. Rachitis occurred most often in children born of women younger than 18 years of age and women older than 35.

It was established that the following factors were of particular significance in development of this disease; rachitis most often developed in children: whose mothers did not receive Vitamin D preparations during pregnancy, in premature children, in children with melabsorption syndrome, in children whose mothers had extragenital diseases and received imbalanced feeding, in children receiving anticonvulsive preparations, in children having early mixed and artificial feeding and in frequently ill children.

The content of the highest fatty acids in blood serum of the studied patients was determined by means of gas- liquid chromatography[4]. For identification of separated methyl aether fatty acids the method of "witness" and "sorbent-sorbat"method based on structural group contents were used. As a result of identification the following fatty acids were revealed in the blood serum: C(16:0) - palmitinic acid, C(16:1) - palmitoleinic, C(18:0) - stearic, C(18:1) - oleic, C(18:2) - linolic, C(18:3) - linoleic and C(20:4) - arachidonic acid. The content of fatty acids was determined by internal normalization method.

RESULTS END DISCUSSION

The received results concerning determination of the highest fatty acids content in the blood serum of children ill with rachitis in comparison with the data of healthy children are presented in Table 1

Table 1: The content of the blood serum fatty acids in children with rachitis

Fatty acids	Control	On 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 – reliability of differences between indications in the group of sick children and healthy ones.

As it is seen from the given data in children with Vitamin-D deficient rachitis the content of such fatty acids as palmitinic, strearic and linolic acids increases and palmitoleinic, oleic, linoleic and arachidonic acids decreases and that is the evidence of lipid exchange disturbance in rachitis. It motivates the necessity to correct lipid exchange in this pathology and to add vegetable oils.

In order to choose an adequate vegetable oil we evaluated vegetable oil availability by the body according to the blood serum lipase activity. Our study showed that lipase activity in the control group (15 children) made 10,2±3,6 mkmol (l· min). In cotton oil consumption in dietary intake the lipase activity made 10,5±4,1 mkmol (l· min) (n=15),i.e.no marked changes are observed in this group. In sesame oil consumption lipase activity made 16,8±4.2 mkmmol (l·min) (n=17), sea-buckthorn oil 18,9±3,7 mkmol (l· min) (n=17) and in apricot oil consumption blood serum lipase activity in children increased significantly and made 20,7±3,9 (l· min) (n=18). From the received data it is clear that apricot oil consumption

results in more than twice increase of lipid availability due to increase of blood serum lipase activity and consequently improves the lipid exchange indexes [1,2].

On the other hand apricot seeds of different sorts contain 20,5-57,7% of fatty oil, 20,6-28,0% of protein, 2,8-3,1% of mineral salts (potassium, calcium, phosphorus, iron and others) [7,8]. Fatty acidic percentage content of apricot oil makes: olein acid (C 18:1) 55-65%, linoleic (C18:2) 25-35%, palmitinic (C16:0) 3-7%, stearic(C18:0) to 2%, palmitoleinic (C16-1) to 1%, linoleic (C18:3) to 1% [8].

In connection with this apricot oil is used as the substance that corrects the impaired lipid exchange in rachitis as it is rich of polysaturated fatty acids, it has a pleasant smell and taste, it has a high biological activity and it has a favourable effect on exchange processes in the child's body.

Apricot oil consumption was calculated according to a formula:

$V = G \cdot m$,

Note: G- 24 hours requirement of oil consumption on 1 kg of the body weight equal to 0,5; V- the dose of apricot oil (in ml), m- body weight (in kg).

The oil was added to breast milk, to extra food and was steadily distributed according to the number of feedings. Apricot oil was distributed according to a scheme, beginning from 5 to 10 drops for 24 hours and during 10-24 days its amount was brought to optimal. In most children who received apricot oil side effects due to its consumption were not observed. In 3 children more frequent stool of 4-5 times without pathology was observed during 24 hours due to rapid increase of the oil amount. In order to eliminate dysmetabolism of the highest fatty acids in children with rachitis it is recommended to administer apricot oil as therapeutic agent. With the purpose to establish the apricot oil dose we studied dependence of the number of days of the oil consumption of the content of unsaturated fatty acids (USFA), the chart is presented in Figure 1

According to the chart control content of USFA amount occurs in 12-15 days. So apricot oil was administered in the 1st degree of rachitis during 12-14 days, in the 2nd degree of the disease during 24 days that resulted in restoration of lipid exchange and provided high therapeutic efficacy in children with rachitis

The study of the highest fatty acids content in the blood serum of children with rachitis presenting group I (38 sick children)and being treated according to traditional method Table 2 and group II (29 sick children) receiving modified therapy on the background of traditional method was carried out Table 3

Figure 1: Dependence of the number of days of the oil consumption of the content of unsaturated fatty acids

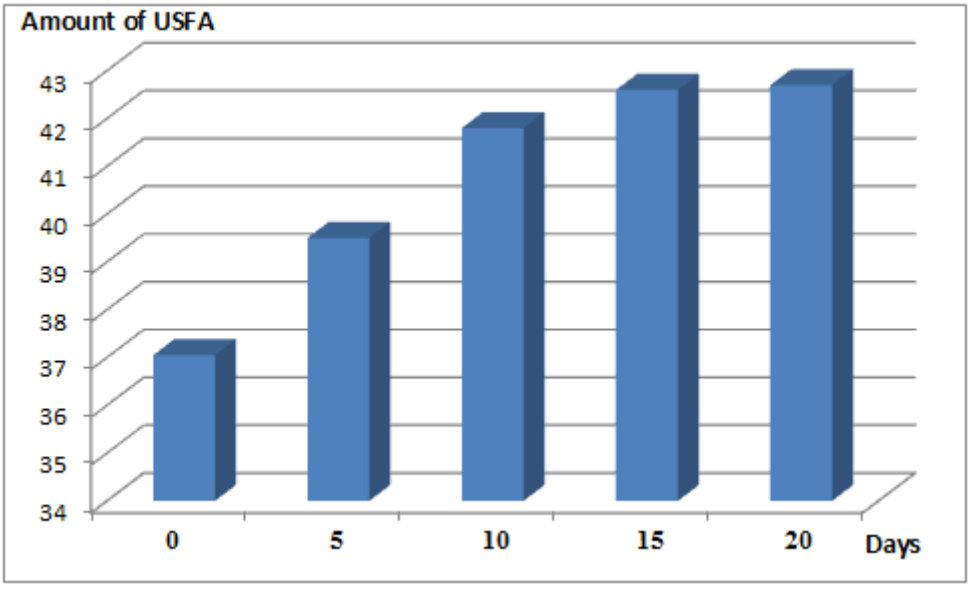

Table 2: The content of the blood serum fatty acids in children with rachitis being treated according to traditional method

Fatty acids	Control	Traditional method	
		M±м	P<
C (16:0)	28,17±1,37	28,96±1,28	0,01
C (16:1)	2,70±0,22	1,62, ±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- concerning healthy children

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

Fatty acids	Control	Method of treatment			
		Traditional		Modified	
		M±м	P<	M±м	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 – concerning healthy children

In the examined children ill with rachitis and treated according to the traditional method there was noticed a wide range of fluctuations of the studied lipid exchange indexes.

We consider that lipid imbalance may be caused by the effect of specific therapy in the body which is first of all directed on correction of phosphorocalcium exchange, so normalization of the studied lipid exchange indexes did not occur that made their further correction necessary.

As it is seen from Table 3 the used method of treatment showed its high efficacy that is confirmed by the received data: 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±o,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 effect of modified treatment the indexes of fatty acids became normal in most patients.

Significant changes of the highest fatty acids content were revealed in the blood serum in children ill with rachitis. The depth of changes of the highest fatty acids content depended on the degree of the pathologic process severity. The revealed disturbances of the highest fatty acids content was corrected by means of apricot oil and the results of therapy were presented. Efficacy of the presented method of treatment in children with rachitis was shown in optimal doses of apricot oil.

CONCLUSIONS

i. It is established that children ill with rachitis have significant disturbances in the highest fatty acids disturbances that is the evidence of lipid exchange disturbance.

ii. It is revealed that traditional method of treatment of children ill with rachitis does not result in

metabolic recovery of the highest fatty acids in the blood serum.

iii. In order to eliminate the highest fatty acids dysmetabolism in children ill with rachitis it is recommended to administer apricot oil that results in restoration of the highest fatty acids metabolism and provides high therapeutic effect.

iv. Use of apricot oil in children suffering from rachitis causes better, more than twice, availability of lipids due to increase of the blood serum lipase activity that results in improvement of lipid exchange indexes.

REFERENCES

[1] Ibatova Sh.M., F.H. Mamatkulova, S.N. Muhamadieva, Ahmedov Sh.O. Use of apricot oil in treatment of children with Vitamin D-deficient rachitis. Jubilee collection of scientific articles with International participation "Problems of Pediatrics and Children's Surgery in XXI century". Bishkek. 2014. 69-73.

[2] Ibatova Sh.M., Yazdanov A.Ya., Hasanova D. Apricot oil as regulator of the blood serum lipase activity in children with Vitamin D-deficient rachitis. J. Problems of biology and medicine.2013. 4(75):138-139.

[3] Kapranova E.I. To the question of rachitis. Russian Pediatric Journal. 2003.(6):39-42.

[4] Muhamadiev N.K., Ibatova Sh.M., Ergashov I.M. Gas- chromatographic determination of fatty acids in the blood serum of children ill with rachitis. West-Ukrainian symposium on adsorption and chromatography. Lviv, 2000. 211-214.

[5] Neudahin E.V., Ageikin A.V. Controvercial theoretical and practical questions concerning rachitis in children at contemporary stage// Pediatrics, 2003. (4):95-98.

[6] Rustamov M.R., Ibatova Sh.M., Uralov Sh.M., Ataeva M.S., Yusupova M.M. About the content of the highest fatty acids in Vitamin D- deficient rachitis.Bulletin of GP.- 2008. (3):54-56.

[7] Saenko A.Yu., Marshalkin M.F., Ushakova L.S. Study of apricot stone oil content growing in North Caucasus. Success of contemporary natural sciences. 2005. (7):77-79.

[8] Stepicheva N.V., Fudko A.A. Vegetable oils with optimal fatty acidic content. Chemistry of vegetable raw material.2011. (2):27-33.

[9] Strukov V.I.,Maksimova M.N., Radchenko L.G., Kuptsova T.A. Rachitis in children of the first year of life with transit insufficiency of the thyroid gland.News of Higher educational institutions. Povolzhsky Region. Medical sciences. 2013.3(27):62-72.

[10] Muhamadiev N.Q., Ibatova Sh.M.,Ergashev I.M.BIOL 249-StudyFatty-acid composition of blood serum in children at vitamin D-deficient rachitis by the method of gas-liquid chromatography abstract of papers of the american chemical society.- 1155 16TH St,Nw,Washington,Dc 20036 Usa:Amer Chemical Soc, 2007. T. 234.