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HYGIENIC ANALYSIS OF NUTRITION AND FOOD QUALITY OF CHILDREN WITH OXALAT NEPHROPATHY IN PRESCHOOL AND SCHOOL AGE

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ABSTRACT

In recent years, the frequency of kidney diseases in children, including dysmetabolic nephropathy, has increased, which is associated both with improving the quality of diagnosis and the deterioration of the ecological situation. In this regard, the problem of early diagnosis, the appointment of adequate diet and drug therapy is relevant. The article deals with the problem of etiology, pathogenesis, as well as criteria for the diagnosis of dysmetabolic nephropathy in children. Attention is paid to the clinical manifestations of this pathology and the basic principles of treatment and prevention.

Keywords: children, dysmetabolic nephropathy, crystalluria, oxalaturia.

INTRODUCTION

One of the most important scientific and practical areas of health care organization and social pediatrics is the regional approach to the study of children's health [1,2,3,4]. Its formation is influenced by climate geographic, ecological and economic living conditions of children, the level of migration, ethnic and socio-cultural characteristics of the population, as well as differences in the material and technical base of treatment and prevention facilities [6,9,10]. Dysmetabolic nephropathy and urinary stone disease are the most prevalent in environmentally unfavorable areas [5,6].

The aim of Research. To study the prevalence of oxalate nephropathy and to improve prevention and rehabilitation measures for preschool and school age children in environmentally disadvantaged areas.

RESEARCH METHODS

Optimal nutrition of preschool and school age children with oxalate nephropathy living in Khorezm region, optimization of treatment and prophylactic measures for dysmetabolic nephropathy, taking into account drinking water.

An assessment of the nature of nutrition in our study showed that a common condition can be observed in the diet of children in all cities. Meat and fat deficiency, acute deficiency of dairy products, vegetables and fruits, excess sugar, but according to the literature, high levels of shavel acid and urate metabolism it is well known that it is associated with overconsumption

(N.P. Shabalov, 2001). In our study, this fact was partially confirmed. Thus, it must be acknowledged that the anthropotechnogenic factor and the nature of the diet have been identified as primary risk factors for the development of DMN in Khorezm region. To confirm the facts, we present the results of tests for the analysis of food quality of the population of Khorezm region.

Based on the results obtained in 2017-2019, it can be said that 2255 trials were conducted for 15 different food products inspected 6349 times. Of these, 30 did not meet the medical and biological response, 107 did not meet the requirements of GOST, and 2803 were detected toxic elements.

The interaction of the identified essential and toxic elements reflects the accumulation of toxic elements in the body of a sick child and their participation in tubulointerstitial tissue damage in the absence of essential macro- and micronutrients. However, the positive interaction of toxic elements means that they not only accumulate in the body of children with this pathology, but also synergism, which negatively affects the kidney structures and the immune system.

Thus, the entry of toxicogenic micronutrients (exogenous) into the body of a child, their accumulation in organs and systems, a clear imbalance, an increase in silicon and heavy metals in water leads to more rapid development of DMN and their appearance in urine, high levels of oxalaturia, crystalluria, and metabolic disorders in adults. And will be a key factor in the further development of STK, even in children.

The analysis of the obtained data showed that meat products (beef, mutton, chicken and their products) from the main foods in the diet of children in the observation group were 22.6-25% lower than the norm in the winter-spring season, respectively, in the summer-autumn season. It was found to be 25.7-29.4% lower. Despite the fact that Khorezm region is located near the Amudarya and there are many reservoirs, we can see that children consume 1/3 of the norm set for the winter-spring season, which is slightly higher than the norm for the summer-autumn season.

Dairy products belong to the group of products with high nutritional value: they contain a significant amount of irreplaceable nutrients and have a high ability to be digested and absorbed. In the diet, dairy products are the main source of animal protein (essential amino acids), calcium, phosphorus, vitamins V2 and A, and these substances play an important role in the growth and development of children's bodies. The main group of children observed that they consumed almost half of the recommended norm of dairy products in both seasons (43.5-53.4% in the winter-spring season, 41.4-50.4% in the summer-autumn season).

Egg whites are mainly rich in proteins, while the yolk is rich in iron, all reserves of fats, vitamins A, B and D, choline and lecithin. In the analysis of the diet, it was observed that eggs are 26-33% and 34-43.8% lower than the norm, respectively, according to the season.

Bread is one of the most consumed products in the diet, has a high nutritional value and provides the body with complex carbohydrates (starch and dietary fiber), proteins, vitamins (V1, V2, V6, RR, folate, E), magnesium, iron. Bread products (bread and flour products) were consumed 33.2-51.8% more than the norm in both groups (winter-spring and summer-autumn) in all three seasons.

Legumes and legumes are the main source of complex carbohydrates (starch) in the human diet, providing 70-90% of this macronutrient in the diet. Their protein is deficient in lysine and threonine, and their biological value is not high. At the same time, the mixture satisfies about 40% of the need for protein in a balanced diet. It was found that children consumed these products significantly less than the norm (9.3-20.5%).

Vegetables and fruits are a unique source of essential nutrients: ascorbic acid, b-carotene, bioflavonoids. They contain significant amounts of dietary fiber, magnesium, potassium, iron, folic acid, vitamin K. Of the carbohydrates, the natural forms of mono- and disaccharides are relatively more widespread, and a number of vegetables (potatoes) contain significant amounts of starch. It was found that children consumed slightly more potatoes (11.3-13.7 g) in the winter-spring season than in the summer-autumn season. In the analysis of consumption of vegetables and fruits, we can see the opposite, that is, in the summer-autumn season compared to the winter-spring season consumed 26.1-33.3 g of vegetables and 31.2-45.4 g of fruits. This situation can be explained by the abundance and low cost of these products in the summer-autumn season.

Children consumed mainly cottonseed and sunflower oils from vegetable oils, which was 16.7-32.7% less than the norm, regardless of the product season. The most butter was consumed from animal fats, which was 81.5-87.3% in the winter-spring season and 71-74% in the summer-autumn season.

Sugar and confectionery products were found to be below the norm in the diet in both seasons: 77.8-82.5% and 70.1-76.5%, respectively. It should be noted that these products were consumed more in young children than in adults.

Table 1 Foods consumed the main group in relation to age during the winter-spring season

Food	4-6 years old		7-11 years old		11-13 years old	
	Norm, g	actual, g (%)	Norm, g	actual, g (%)	Norm, g	actual, g (%)
Meat products	95	73,5 (77,4)	125	95,3 (76,2)	135	101,2 (75,0)
Fish products	20	6,8 (34,0)	30	11,6 (38,7)	35	12,1 (34,6)
Dairy products	600	320,4 (53,4)	510	245,8 (48,2)	535	232,5 (43,5)
Eggs (prices)	0,5	0,37 (74,0)	0,8	0,55 (68,8)	1,0	0,67 (67,0)
Bride products	143	215,8 (150,9)	238	361,3 (151,8)	299	437,8 (146,4)
Legumes	20,5	18,6 (90,7)	21	17,9 (85,2)	22,5	19,6 (87,1)
Potatoes	120	98,7 (82,3)	130	108,9 (83,8)	150	126,6 (84,4)
Vegetables	191	136,7 (71,6)	300	216,9 (72,3)	313	225,4 (72,0)
Fruits and berries	203	135,4 (66,7)	222	152,3 (68,6)	330	214,0 (64,8)
Vegetable oil	15	12,5 (83,3)	18	14,6 (81,1)	15	12,1 (80,7)
Animal oil	10	8,6 (86,0)	15	13,1 (87,3)	20	16,3 (81,5)
Sugar and confectionery	60	49,5 (82,5)	65	52,4 (80,6)	69	53,7 (77,8)

Note: The table takes into account the recommended daily amount and package of food products according to SanMvaQ №0105-01.

Table 2 Foods consumed the main group relative to the age of the summer-autumn season

Food	4-6 years old		7-11 years old		11-13 years old	
	Norm, g	actual, g (%)	Norm, g	Norm, g	actual, g (%)	Norm, g
Meat products	95	70,6 (74,3)	125	90,7 (72,6)	135	95,3 (70,6)
Fish products	20	9,7 (48,5)	30	14,2 (47,3)	35	16,4 (46,9)
Diary products	600	302,6 (50,4)	510	227,6 (44,6)	535	221,6 (41,4)
Eggs (piedes)	0,5	0,33 (66,0)	0,8	0,45 (56,3)	1,0	0,58 (58,0)
Bread products	143	190,5 (133,2)	238	333,6 (140,2)	299	415,8 (139,1)
Legumes	20,5	17,2 (83,9)	21	16,7 (79,5)	22,5	18,2 (80,9)
Potatoes	120	86,4 (72,0)	130	95,2 (73,2)	150	115,3 (76,9)
Vegetables	191	162,8 (85,2)	300	251,1 (83,7)	313	258,7 (82,7)
Fruit and berries	203	166,6 (82,1)	222	183,5)82,7	330	259,4 (78,6)
Vegetable oil	15	10,1 (67,3)	18	12,3 (68,3)	15	10,2 (68,0)
Animal oil	10	7,4 (74,0)	15	11,3 (75,3)	20	14,2 (71,0)
Sugar and confectionery	60	45,9 (76,5)	65	49,1 (75,5)	69	48,4 (70,1)

The energy value and chemical composition of the feed rations were calculated taking into account the loss of non-consumable parts and components during cooking (heat) processing.

Comparing the total protein norm by calculating the biological value of the diet: in the winter-spring season, according to age groups - 85.9: 87.1: 86.6%, in the summer-autumn season - 81.7: 83.6: 82, We can see that it is 1% (Tables 3-4).

Table 3 Food ingredients consumed the main group in relation to age during the winter-spring season

Nutrients	4-6 years old			7-11 years old			11-13 years old		
	Norm	The truth	defic., %	Norm	The truth	defic., %	Norm	The truth	defic., %
Protein, g	70	60,1	14,1	80,5	70,1	12,9	88,5	76,6	13,4
Animal protein, g	46	31,9	30,7	49	30,7	37,3	53	32,6	38,5
Oil, g	70	53,9	23,0	80	59,6	25,5	87,5	63,4	27,5
Carbohydrate	270	264,3	2,1	340	357,0	-5,0	373	385,8	-3,4
Strength, kcal	2000	1789,8	10,5	2400	2245,4	6,4	2650	2454,9	7,4
Minerals:									
Calcium, mg	900	554,7	38,4	1100	675,5	38,6	1200	702,4	41,5
Phosphorus, mg	1350	955,5	29,2	1650	1184,4	28,2	1800	1283,4	28,7
Magnesium, mg	200	182,2	8,9	250	226,7	9,3	300	262,8	12,4
Iron, mg	10	7,9	21,0	12	9,7	19,2	16,5	12,3	25,5
Vitamins:									
V1, mg	0,9	1	-11,1	1,2	1,25	- 4,2	1,4	1,45	-3,6
V2, mg	1,0	0,74	26,0	1,4	1,1	21,4	1,7	1,21	28,8
A, mkg	500	391,6	21,7	700	554,3	20,8	900	707,7	21,4
PP, mg	11	9,2	16,4	15	12,7	15,3	18	15,8	12,2
C, mg	50	29,5	41,0	60	35,9	40,2	70	42,2	39,7

Table 4 Food ingredients consumed the main group according to their age during the summer-autumn season

Nutrients	4-6 years old			7-11 years old			11-13 years old		
	Norm	The truth	defic., %		Norm	The truth	defic., %		Norm
Protein, g	70	57,2	18,3	80,5	67,3	16,4	88,5	72,7	17,9
Animal protein, g	46	28,9	37,2	49	29,4	40,0	53	29,6	44,2
Oil, g	70	48,1	31,3	80	53,5	33,1	87,5	60,5	30,9
Carbohydrate	270	247,5	8,3	340	309,1	9,1	373	341,1	8,6
Strength, kcal	2000	1696,6	15,2	2400	2080,8	13,3	2650	2275,4	14,1
Minerals:									
Calcium, mg	900	502,4	44,2	1100	638,8	41,9	1200	610,3	49,1
Phosphorus, mg	1350	825,3	38,9	1650	999,4	39,4	1800	1121,8	37,7
Magnesium, mg	200	170,3	14,9	250	213,7	14,5	300	251,1	16,3
Iron, mg	10	6,8	32,0	12	8,8	26,7	16,5	9,8	40,6
Vitamins:									
V1, mg	0,9	0,85	5,6	1,2	1,1	8,3	1,4	1,31	6,4
V2, mg	1,0	0,88	12,0	1,4	1,25	10,7	1,7	1,42	16,5
A, mkg	500	423,7	15,3	700	581,3	17,0	900	741,3	17,6
PP, mg	11	8,8	20,0	15	11,8	21,3	18	14,6	18,9
C, mg	50	41,6	16,8	60	49,3	17,8	70	57,2	18,3

At the same time, it was found that the amount of animal protein in the diet decreased from 20.7% to 44.2%, depending on the season. It should be noted that the balance of proteins in the diet of children ensures the growth and development of the organism. 55% of the protein in the human diet should be satisfied at the expense of animal protein and 45% at the expense of plant protein. From the analyzes, it can be concluded that only in 4–6-year-old children, the ratio of animal and plant protein was almost normal in both seasons, while in the remaining cases, plant protein was relatively high.

It was also found that the amount of fat in the diet of children is lower than the norm: in the winter-spring season - 77.0: 74.5: 72.5%, in the summer-autumn season - 68.3: 66.9: 69.1%.

When analyzing the carbohydrates in the diet of children, we can see that in only two cases are children aged 7-10 and 11-13 years above the norm in the winter-spring season, and in other cases, this figure is not less than 90%.

Strength in the winter-spring season covered 89.5: 93.6: 92.6% of the norm, while in the summer-autumn season the figure was 84.8: 86.7: 85.9%, depending on age. It should be noted that the energy expended in both seasons was not fully covered in any group.

According to the theory of rational nutrition, the ratio of protein, fat and carbohydrates in the diet should be 1: 1: 4. In our study, this figure was 1: 0.90: 4.40 according to the age of the children in the winter-spring season; 1: 0.85: 5.10; 1: 0.83: 5.04, while in the summer-autumn season it was 1: 0.84: 4.3; 1: 0.79: 4.59; 1: 0.83: 4.69. Analysis of mineral elements in the diet showed that calcium was 50.9-61.6%, depending on age and season. The remaining trace elements were as follows: phosphorus - 60.6-71.3%, magnesium - 83.7-91.1%, iron - 68.0-80.8%.

Analyzing the vitamins in the diet of children, it can be said that in the winter-spring season in all age groups vitamin V1 was slightly higher than normal (3.6-11.1%), but other vitamins were below normal in both seasons (21.3-5 , 6%).

Practical results of the research. Thus, the main group in the study in the analysis of children's diets: bread products in excess of 50% of the amount recommended in the normative documents for the year; other types of food, especially fish, were found to be consumed roughly below the norm. In the analysis of vital nutrients in the diet, it was observed that the amount of protein, fat and carbohydrates was significantly below the norm in all seasons, especially fats. The strength of the diet is not covered by 6.4-15.2% of the norm. An analysis of the nutritional value of minerals and vitamins (excluding vitamin V1) in the diet also found that they were below the norms set for age and season. In the analysis of the ratio of protein, fat and carbohydrates, deviations from hygienic standards were observed in all cases.

CONCLUSION

In general, the structure of hospitalization pathology of the main group of children under investigation and diseases of the urinary system of children showed that it depends on the area where children live, its ecological and biogeochemical characteristics. Poor quality and unsuitability of water and food rations in the region, non-compliance with the requirements often lead to the development of dysmetabolic nephropathy (oxalaturia, crystalluria), as well as secondary immunodeficiency in children increases the urinary tract microbial-inflammatory processes, dysmetabolic diseases urinary stones leads to the development of diseases.

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