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Physical Development and Features of Nutrition of Children with Urinary Diseases

ABSTRACT

The aim of the study was to evaluate the physical development and diet of children with diseases of the urinary system. According to the results of the study it was found that children with diseases of the urinary system lagged behind their healthy peers on anthropometric parameters. At the analysis of the patient's body weight deviations from recommended one it was revealed that in the majority of patients of the main group mild to moderate malnutrition degrees were noted. At comparing the diets, it was noted that low-protein diet helps to reduce the rate of fall in glomerular filtration.

Keywords: children, physical development, diseases of the urinary system, nutrition

Physical development of the growing organism is one of the indicators of child health. The more significant violations in the physical development of the child, the greater the probability of having the disease. [1]

The aim of our study was to evaluate the physical development and diet of children with diseases of the urinary system.

MATERIALS AND METHODS

The study included 34 children. The study involved 17 children with diseases of the urinary system (9 girls and 8 boys) aged 5 to 17 years. By disease children were distributed as follows: chronic glomerulonephritis - 9 children, toxic capillary nephritis - 2, acute glomerulonephritis - 3, tubulointerstitial nephritis - 1, chronic pyelonephritis - 2.

For all the children anthropometry was conducted. Body growth was measured stadiometer accurate to 0.5 cm, body weight was determined on the health scale accurate to 0.1 kg. Head circumference and chest circumference measuring tape measured accurate to 0.5 sm. Skinfold measured triceps.

From growth-weight ratios the Ketle index was used, calculated by the formula: M / L, where M - mass in kilograms, L - height of the individual, measured in meters squared. Normal values range from 20 to 25, below 18 is considered as an indicator of malnutrition above 27 - as obesity. [2]

Also, indicators such as the percentage deviation from the recommended body weight. Decrease in the ratio of body weight/body weight recommended, measured in % to 80% in patients without edema, usually means a slight degree of malnutrition; decrease this value to 70% or less indicates severe malnutrition [4]

To compare the anthropometric data of 17 healthy children were collected. [5]

Children with diseases of the urinary system referred to as "main group" healthy children named as the "control group".

All patients were asked to maintain a food diary.

RESULTS AND DISCUSSION

Glomerular pathology was diagnosed at all children aged 5 years, including 1 child with tubulointerstitial nephritis, 1 - with toxic capillary nephritis glomerulonephritis and 1 child - with chronic glomerulonephritis. Children 6 years: two with chronic pyelonephritis and 2 children - with acute glomerulonephritis. Among children 7 years old 1 child was with acute glomerulonephritis and two - with chronic glomerulonephritis. All children are 14, 15, 16 and 17 years were with chronic glomerulnefritom.

According to the anthropometry children with urinary diseases lag behind their healthy peers in such parameters as body weight, chest circumference, as well as in growth at children up to 7 years (table 1).

In comparison with the norm in children with diseases of the urinary system the lower skinfold thickness is determined (table 2).

We determined Ketle index depending on the type of urinary tract disease in children.

As the table 3 shows all the children were below 18 figures, indicating malnutrition. The lowest rates were in children with chronic pyelonephritis.

We have determined the percentage deviation from the recommended weight children, which is calculated by the formula: m1 × 100% / m2, where m1 - weight of the subject, m2 - recommended body weight (RBW) (table 4,5) .

In the analysis of deviations from the patient's body weight recommended we revealed that male children in the main group one child with severe disease malnutrition was bound at least (body weight less than 70% of the recommended). The majority of patients of the main group had mild to moderate malnutrition. And anyone from the main group had no recommended body weight. In the control group, only two children had a slight degree of malnutrition, the rest of them had recommended body weight. In children, females practically, we observed the same pattern. In children with severe malnutrition hydronephrosis kidney and chronic glomerulonephritis with nephrotic syndrome were observed on the background of chronic pyelonephritis. All patients on the results of additional studies were divided into two groups:

Group 1 - 12 patients who adhered to the prescribed diet;

Group 2 - 5 patients, with a free diet.

All the children were tested for glomerular filtration rate, albumin, calcium and phosphorus in the beginning and end of the survey (table 6).

The evaluation results of protein intake in group 1 showed that patients on average during the observation consumed protein - 0.5 g / kg, in group 2 - 1.1 g / kg per day. The glomerular filtration rate (GFR) was higher in the group of patients with free diet, also there was increase in the level of phosphorus, calcium and albumin reduction.

Conclusion. Thus, as a result of our study we revealed that all children have protein-energy malnutrition of middle and low degrees. According to the anthropometry, children with diseases of the urinary system lag behind their healthy peers on such parameters as body weight, chest circumference and children up to 7 years for growth. In comparison with the norm in children with diseases of the urinary system the lower skinfold thickness is determined. The low-protein diet helps to reduce the incidence rate of GF.

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Table 1. Average anthropometry in the groups studied depending on the age.

Groups	Age, years	Body Weight, kg	Height, sm	Head circumference, sm	Chest circumference, sm
The Main Group	5	17,9	106	54,1	59,3
	6	22,2	126,7	54,3	61,7
	7	25,3	128	53	63,3
	14	50	176	57	71,5
	15	40	153	55	78
	16	48	175	53	86
	17	54,3	161,7	57,7	91
The Control Group	5	21.5	108	54,9	61,7
	6	26,3	127	55,8	63,4
	7	27	129	54	64.5
	14	60,4	176	-	79
	15	66,5	171	-	82
	16	67	175	-	89
	17	68	176	-	94

Table 2. Average skinfold thickness triceps in the groups studied depending on age, in mm

Age, years	thickness of subcutaneous fat layer with the skin	
	Boys	Girls
5	3	2,2
6	2,9	3.2
7	4,2	2
14	2.5	-
15	-	3,2
16	-	3
17	3	2,5

Table 3. Ketle index in the groups studied.

Diagnosis	Number of children й	Ketle index
Chronic glomerulonephritis	9	17,5
Toxic capillary nephritis	2	16,7
Acute glomerulonephritis	3	16,8
Tubulointerstitial nephritis	1	17,3
Chronic pyelonephritis	2	15,4

Table 4. Deviation from the RBW boys

Groups	Recommended body weight	Degree of protein-energy malnutrition (PEM)		
		Weak (> 80% RBW)	Medium (70-80% RBW)	Weight (<70% RBW)
The main (n=8)	0	1	6	1
The control (n=8)	6	2	0	0

Table 5. The deviation from the RBW girls

Groups	Recommended body weight	Degree of protein-energy malnutrition (PEM)		
		Weak (> 80% RBW)	Medium (70-80% RBW)	Weight (<70% RBW)
The main (n=8)	0	2	6	1
The control (n=8)	6	3	0	0

Table 6. Dynamics of laboratory parameters in the groups studied.

Indicators	Group 1 (n=12)	Group 2 (n=5)
Protein intake, g / kg per day	0,5	1,0
Drop Speed GF ml / min per month	0, 30	0,50
Albumin, initially / at the end of the study, g / l	44,3/44,2	43,9/42,9
Calcium initially / at the end of the study, mmol / l	2,41/2,3	2,34/2,0
Phosphorus initially / end of the study, mmol / l	1,60/1,58	1,55/1,80

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