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NEUROLOGICAL STATUS IN CHILDREN WITH HELMIST INVASION

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ABSTRACT

Introduction. According to the World Health Organization (WHO), "... intestinal helminthiasis ranks second among parasites after diarrhea, their frequency of occurrence is more than 3.5 billion cases per year, the risk group for infection with helminthiasis includes children aged 5-14 years, in different countries, the incidence of geohelminthiasis in children under 17 years of age ranges from 27% (India), 6-7% (Indonesia, China, Nigeria), to 2-3% (Democratic Republic of the Congo, Tanzania and the Philippines). Objectives of the study: to study clinical neurological parameters in children with helminth and protozoal infestations, and based on the data obtained, to develop treatments for neurological complications. Materials and methods. To confirm parasite carriage, scatological studies were carried out in 114 examined children. The result was the division of the studied children into groups. The main group consisted of 80 children with combined helminth -protozoal infestation in the form of giardiasis and hymenolepiasis (dwarf tapeworm), the comparison group consisted of 34 children with an isolated form of giardiasis. The result of the study. It should be noted that according to the data we received, the main complaints of patients and the main reason for visiting medical institutions were not clinical signs of invasion, but complaints of an asthenic -neurotic nature (48.4%), as well as convulsive attacks (30.8%) and tic hyperkinesis (20.8%). Conclusions. Thus, as a result of the studies, the presence of signs of damage to the autonomic nervous system was revealed in all examined children with both combined and isolated forms of helminth and protozoal infestation.

Key words: helminth, hymenolepiasis, lambliosis, nervous system, invasion.

INTRODUCTION

According to the World Health Organization (WHO), "... intestinal helminthiasis ranks second among parasites after diarrhea, their frequency of occurrence is more than 3.5 billion cases per year, the risk group for infection with helminthiasis includes children aged 5-14 years, in different countries, the incidence of geohelminthiasis in children under 17 years of age ranges from 27% (India), 6-7% (Indonesia, China, Nigeria), to 2-3% (Democratic Republic of the Congo, Tanzania and the Philippines [3, 8, 10]. Uzbekistan is one of the countries with a hot climate, for which helminth and protozoal diseases are endemic [1, 2, 5]. Today, the number of infested people is about 200 thousand people, 70% are children under 14 years of age [4, 7]. The most widespread protozoal invasion on the territory of Uzbekistan belongs to giardiasis, and from helminthic invasion - hymenolepiasis [6, 9]. The nervous system is the most sensitive to pathological changes

in homeostasis. At the same time. According to many researchers, restoration of body functions and human recovery also depend on the state of the nervous system [11, 12].

Objectives of the study: to study clinical neurological parameters in children with helminth and protozoal infestations, and based on the data obtained, to develop treatments for neurological complications.

MATERIALS AND METHODS

To confirm parasite carriage, scatological studies were carried out in 114 examined children. The result was the division of the studied children into groups. The main group consisted of 80 children with combined helminth -protozoal infestation in the form of giardiasis and hymenolepiasis (dwarf tapeworm), the comparison group consisted of 34 children with an isolated form of giardiasis.

RESULTS AND DISCUSSION

It should be noted that according to the data we received, the main complaints of patients and the main reason for visiting medical institutions were not clinical signs of invasion, but complaints of an asthenic -neurotic nature (48.4%), as well as convulsive attacks (30.8%) and tic hyperkinesis (20.8%). The duration of these neurological complications ranged from several weeks to 2-3 years. Thus, in children of the main group, manifestations of convulsive syndrome were recorded for an average of 6 ± 0.13 months, tic hyperkinesis for 2 ± 0.14 months, while SVD for 5 ± 0.17 months. In the comparison group, tics manifested themselves within 3 ± 0.01 months, and VDS within 10 ± 0.1 months. ($P < 0.05$). When analyzing the duration of manifestations of neurological complications, it is clear that with isolated giardiasis this process is slower, persistent and prone to chronicity. whereas with combined invasion, there is a reduction in the time of manifestation of neurological complications due to the addition of dwarf tapeworm, which gives the most severe microelement and vitamin deficiency. Clinical manifestations of combined invasion by hymenolepiasis and giardiasis were a combination of manifestations of each invasion. It should be noted that, depending on the quantitative characteristics and primary nature of the infection, the main clinical signs of either giardiasis or hymenolepiasis prevailed.

Abdominal pain was observed in 4 (28.5%) patients with this pathology with a mild degree of the disease, in 28 (45.9%) with a moderate degree and in 38 (97.4%) with a severe degree. Nervousness was observed in 3 (21.4%) children with a mild degree of the disease, in 19 (31.1%)

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with a moderate degree and in 28 (71.1%) with a severe degree of the disease. Nervous involuntary movements were present in 4 (28.5%), 18 (29.5%) and 26 (66.6%), respectively, nocturnal enuresis - in 5 (35.7%), 12 (19.6%) and in 16 (41%) patients, respectively, tooth grinding in 6 (42.8%), 9 (14.7%) and 15 (38.4%) patients, respectively, weight loss in 8 (57.1%), 25 (40.9%) and 36 (92.5%) children, respectively. Other clinical symptoms also trended with disease severity (Table 1).

Table 1. Distribution of clinical symptoms in children with hymenolepiasis depending on the severity of the disease

Clinical symptoms	Mild disease (n =14)		Average severity of the disease (n =61)		Severe (n =39)		χ^2	R		
	abs.	%	abs.	%	abs.	%				
Abdominal pain	4	28.5	28	45.9	38	97.4	χ_{12}	1.40	P ₁	0.237
							χ_{22}	29.70	P ₂	0.0001
							χ_{32}	28.16	P ₃	0.0001
Nervousness	3	21.4	19	31.1	28	71.7	χ_{12}	0.52	P ₁	0.471
							χ_{22}	10.76	P ₂	0.001
							χ_{32}	15.78	P ₃	0.001
Nervous involuntary movements (NIM)	4	28.5	18	29.5	26	66.6	χ_{12}	0.00	P ₁	0.945
							χ_{22}	6.09	P ₂	0.014
							χ_{32}	13.33	P ₃	0.000 1
Nocturnal enuresis	5	35.7	12	19.6	16	41	χ_{12}	1.67	P ₁	0.196
							χ_{22}	0.12	P ₂	0.727
							χ_{32}	5.38	P ₃	0.020
Teeth grinding	6	42.8	9	14.7	15	38.4	χ_{12}	5.62	P ₁	0.018
							χ_{22}	0.08	P ₂	0.773
							χ_{32}	7.33	P ₃	0.007
Weight loss	8	57.1	25	40.9	36	92.3	χ_{12}	1.21	P ₁	0.272
							χ_{22}	9.04	P ₂	0.003
							χ_{32}	26.34	P ₃	0.0001
Developmental delay	8	57.1	21	34.4	28	71.7	χ_{12}	2.48	P ₁	0.115
							χ_{22}	1.02	P ₂	0.314
							χ_{32}	13.29	P ₃	0.0001
Itching on the skin	7	50	23	37.7	29	74.3	χ_{12}	0.72	P ₁	0.397

							χ^2	2.81	P ₂	0.094
							χ^3	12.81	P ₃	0.0001
Hepatomegaly	-	-	8	13.1	20	51.2	χ^1	2.06	P ₁	0.152
							χ^2	11.53	P ₂	0.001
							χ^3	17.19	P ₃	0.0001
Splenomegaly	-	-	5	8.1	8	20.5	χ^1	1.23	P ₁	0.268
							χ^2	3.38	P ₂	0.066
							χ^3	3.19	P ₃	0.074

Note: P₁, P₂, P₃ – reliability of differences in the indicators of patients with mild and moderate, mild and severe, moderate and severe severity, respectively.

The issue of the relevance of neurological complications in the combined course of hymenolepiasis and giardiasis has increased in recent years due to the tendency to increase the infestation rates of these parasitoses throughout the territory of the Republic of Uzbekistan, as well as the insufficient knowledge of this problem. It should be noted that in our study, in the examined children, there was a dominance of signs of damage to the nervous system over the clinical symptoms of invasions.

In most cases in the main group there is a court o-postural syndrome 52.9%, whereas in the comparison group it was absent ($P < 0.001$). In the comparison group, VSD predominated, which was recorded in 86% of children versus 21.4% of children in the main group ($P < 0.001$). Tic hyperkinesia was recorded in both groups, but significantly prevailed in the main group ($25.7 \pm 3.2\%$ versus $14 \pm 4.9\%$; $P < 0.05$). One of the manifestations of signs of damage to the nervous system due to helminth and protozoal infestations is vegetative dystonia syndrome. It is manifested by lability of vasomotors, instability of blood pressure. In the examined children, the following were noted: bleedgei, depending on the symptoms of the lesion, systemicity and dryness of the skin, persistent red or white dermographism, asymmetry of skin temperature, hyperhidrosis of the palms and feet. When studying vegetative tone, we determined more or less stable characteristics of the state of vegetative indicators during the period of “relative rest”, i.e. relaxed wakefulness. Regulatory apparatuses that maintain metabolic balance in the relationship between the sympathetic and parasympathetic systems are actively involved in ensuring tone. In functional terms, the sympathetic and parasympathetic systems are antagonists. Thus, if sympathetic nerves dilate the pupils and palpebral fissures, increase blood pressure, increase heart rate, dilate bronchi, reduce secretion and weaken intestinal movement, constrict blood vessels, then the actions of the parasympathetic system on these organs are opposite. Integrative indicators give an idea of the vegetative relationships within the system, and the sum of indicators in different systems allows us to more fully judge the initial vegetative tone of the body. According to the data we obtained, it is clear that in the children of the main group the sympathetic orientation of the autonomic tone prevailed (62.3 ± 0.76 versus 43.2 ± 0.93 ; $P < 0.001$), while in the comparison group the parasympathetic orientation (58.3 ± 0.74 versus 38.9 ± 0.72 ; $P < 0.001$), but it should be noted that the indicators of both groups were significantly different from the control, where a balance between the sympathetic and parasympathetic direction of the autonomic tone was recorded (22.7 ± 0.34 versus 23.3 ± 0.36), i.e. normotonia. But it should be noted that in the

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comparison group the score difference between sympathetic and parasympathetic symptoms was 15.1 ± 1.5 points, while in the main group it was 23.1 ± 1.4 points, which confirms the deep degree of damage to the indicators of the autonomic nervous system as a result of combined helminth and protozoal infestation. Condition sympathicotonia is most often associated with the response of stress-realizing mechanisms to some kind of disturbance. Normally, under load, an acceptable level of excitation of the sympathetic division of the VIS is necessary for the implementation of a program for maintaining homeostasis. To study autonomic reactivity, the Danini-Aschner test (ocular-heart reflex) was performed, which characterizes the significant strength of the reaction (the range of fluctuations in autonomic indicators) and its duration (the return of autonomic indicators to the original level). The indicators of 40 healthy children aged 5 to 14 years were taken as the norm.

Studies of autonomic support of various forms of activity also provide important information about the state of the ANS. since vegetative components are a mandatory accompaniment of any activity. One of the signs of damage to the central nervous system is tic hyperkinesia - relatively simple motor acts that occur without a clear periodicity and often change their localization. According to our data, of all the children examined, tics occurred in 20.8%. On the day of determining vegetative support, we carried out a clinorhastatic test, which is the most accessible, simple and physiological. I would like to note that in children with isolated giardiasis invasion, tic hyperkinesia was found only in the face and was limited to eye blinking. I would like to note that in children with isolated giardiasis invasion, tic hyperkinesia was found only in the face and was limited to eye blinking. When making a diagnosis, it is necessary to exclude rheumatism (rheumatism tests) and the organic nature of hyperkinesia, which occurs when the subcortical ganglia are damaged. According to the data we obtained from a biochemical blood test, seromucoid values were within normal limits ($0.180-0.220$ units; 0.22 ± 0.02), the pharmacological test and "C" reactive protein were negative in all cases, which denies an organic nature. When examining the neurological status of these children, a uniform revival of tendon and periosteal reflexes (76%), fibrillary twitching of the tongue (48%) and mild trembling of the fingers of outstretched arms (44%) were observed. Thus, tic hyperkinesia in children with helminth and protozoal infestations were functional in nature and limited and -your neurological microsymptoms. The fact that in children with isolated giardiasis infestation only hyperkinesia in the facial area was observed indicates a lower level of intoxication compared to children with combined helminth and protozoal infestation. The most severe manifestation of damage to the nervous system as a result of combined parasitic intoxication was a convulsive syndrome, which occurred in 52.9% of the examined children, while with giardiasis convulsions were not observed. In contrast to convulsions of organic origin, there is no aura with parasitic infestation, and the main cause of convulsions was hunger and overwork. Nose crampstonic-clonic character with a duration of up to 2 - 3 minutes, with a short-term loss of consciousness, tonic tension of the muscles of the trunk and limbs with throwing back of the head (sometimes with the emission of a cry caused by a spasm of the respiratory muscles and muscles of the larynx), with difficulty breathing and cyanosis (55, 6%). The clonic phase of convulsions involved the muscles of the face, trunk and limbs and was accompanied by copious secretion of saliva with further restoration of breathing. Typical absence seizures with cessation of activity and fixation of gaze, without motor impairment for 3-5 seconds, occurred in 27.0% of children. In this case, as a rule, the child did not react to the shouts of adults, and after the attack returned to continue the actions. The behavior of all children with convulsive syndrome was marked by irritability, restlessness, decreased memory and

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performance, capriciousness, tearfulness, etc. In all children with convulsive syndrome, seizures were provoked by hunger, which were accompanied by pain in the left epigastric region and hypersalivation. The location of the pain corresponded to the location of fixation of the dwarf tapeworm specimen in the duodenal mucosa. The neurological picture of this group of children was characterized by scattered microscopicsymptoms accompanied by revitalization of tendon reflexes. When conducting CT and MRI studies in this group of children, no organic changes in the central nervous system were identified. Rapid recovery of consciousness, absence or short post-convulsant sleep against the background of sedatives, and the absence of gross neurological symptoms in neurostatus also distinguished these attacks from organic ones.

CONCLUSION

Thus, as a result of the studies, the presence of signs of damage to the autonomic nervous system was revealed in all examined children with both combined and isolated forms of helminth and protozoal infestation.

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