

# Clinical characteristics of children with hymenolepirosis in Bukhara

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**Abstract.** In 12% of children diagnosed with hymenolepirosis, a mild degree of the disease was observed, in 53% - moderate, and in 35% - severe. Of the clinical signs of the disease, weight loss was detected in 57.1% of children with a mild course, in 40.9% with a moderate course and in 92.5% with a severe course. Growth retardation was observed in 57.1%, 34.4% and 71.1% of children, and pruritus - in 50%, 37.7% and 74.3% of children, respectively. The introduction of the immunocorrective drug immunal into the treatment complex for children diagnosed with hymenolepirosis showed a significant increase in the effectiveness of treatment, which is shown as an important recommendation for use in practical healthcare.

## 1 Introduction

In recent years, the incidence of hymenolepirosis among children has been increasing day by day, remaining one of the pertinent issues in modern infectology. According to the World Health Organization (WHO), "intestinal helminthiasis ranks second among parasites after diarrhea, with an annual occurrence exceeding 3.5 billion cases" [1]. Children between the ages of 5 and 14 years are considered a high-risk group for helminthiasis infection. In different countries, the prevalence of geohelminthiasis in children up to 17 years ranges from 27% (India) and 6-7% (Indonesia, China, Nigeria) to 2-3% (Democratic Republic of Congo, Tanzania, and the Philippines) [8]. In clinical practice, it is essential to determine the impact of hymenolepirosis on the immune system through parasitological, immunological, and molecular-genetic research methods [2].

This pathology is based on the development of secondary immunodeficiency, which contributes to the formation of autoimmune and neoplastic processes in genetically predisposed individuals [3].

The aim of this study was to determine the clinical and immunological characteristics of hymenolepirosis in children and develop rational treatment regimens based on these findings [4].

## 2 Materials and methods

The study employed clinical, biochemical, immunological, and statistical methods. It is the first time that a direct proportional relationship between the clinical manifestations of the

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disease, such as weight loss, growth retardation, skin itching, and involuntary nerve-related movements, and the key indicators of immune and cytokine status in children diagnosed with hymenolepiasis has been demonstrated[5].

The administration of the immunocorrecting agent "Immunal" as part of the traditional treatment for children with this parasitic disease resulted in the normalization of these indicators by reducing the disease's severity, diminishing its clinical manifestations, and addressing the secondary immunodeficiency in the immune and cytokine statuses of the organism [6].

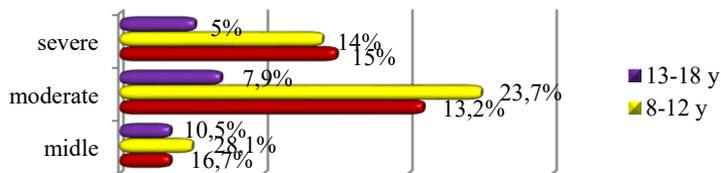
### 3 Results and discussion

The inclusion of the immunocorrecting agent "Immunal" in the treatment regimen for children diagnosed with hymenolepiasis showed a significant improvement in treatment efficacy, presenting an important recommendation for practical healthcare. The study reveals the essential correlation between the key indicators of immune and cytokine statuses and the main clinical manifestations of the disease in these affected children, demonstrating the significance of immunodiagnosis for the disease [7].

The research is supported by complementary results and theoretical methods, methodological correctness of the conducted studies, an adequate number of examined patients, comparison with data from domestic and foreign researchers, and conclusions made by competent authorities [8].

**Practical Significance.** The practical significance of the research lies in the demonstrated significant improvement in treatment efficacy with the inclusion of the "Immunal" preparation in the treatment regimen for children diagnosed with hymenolepiasis [9]. This serves as an important recommendation for its application in practical healthcare. Furthermore, the study has established an organic connection between the primary clinical manifestations of the disease in affected children and the key indicators of their immune and cytokine statuses. The development of an algorithm for early diagnosis and comprehensive treatment of the disease with secondary immunodeficiency is explained by its importance for practical healthcare [10].

The scientific work was conducted at the Bukhara Regional Infectious Hospital, Kagan District Medical Association, and the "Amal" Clinic, which belongs to LLC "Akmal-Stimul."



**Fig. 1.** The distribution of disease severity levels among children with hymenolepiasis, by age and gender, is as follows.

Out of the 114 examined children with hymenolepiasis, 61 had a moderate disease course (Fig 1), while 39 affected children exhibited a severe degree of the disease.

**Table 1.** The distribution of clinical symptoms in children with hymenolepiasis according to the disease severity.

Clinical Symptoms	Mild (n=14)		Moderate (n=61)		Severe (n=39)		$\chi^2$		P	
	abs.	%	abs.	%	abs.	%				
Abdominal pain	4	28,5	28	45,9	38	97,4	$\chi_{12}$	1,40	P <sub>1</sub>	0,237
							$\chi_{22}$	29,70	P <sub>2</sub>	0,0001
							$\chi_{32}$	28,16	P <sub>3</sub>	0,0001
Nervousness	3	21,4	19	31,1	28	71,7	$\chi_{12}$	0,52	P <sub>1</sub>	0,471
							$\chi_{22}$	10,76	P <sub>2</sub>	0,001
							$\chi_{32}$	15,78	P <sub>3</sub>	0,001
Involuntary Movements	4	28,5	18	29,5	26	66,6	$\chi_{12}$	0,00	P <sub>1</sub>	0,945
							$\chi_{22}$	6,09	P <sub>2</sub>	0,014
							$\chi_{32}$	13,33	P <sub>3</sub>	0,0001
Nocturnal Enuresis	5	35,7	12	19,6	16	41	$\chi_{12}$	1,67	P <sub>1</sub>	0,196
							$\chi_{22}$	0,12	P <sub>2</sub>	0,727
							$\chi_{32}$	5,38	P <sub>3</sub>	0,020
Teeth Grinding	6	42,8	9	14,7	15	38,4	$\chi_{12}$	5,62	P <sub>1</sub>	0,018
							$\chi_{22}$	0,08	P <sub>2</sub>	0,773
							$\chi_{32}$	7,33	P <sub>3</sub>	0,007
Weight Loss	8	57,1	25	40,9	36	92,3	$\chi_{12}$	1,21	P <sub>1</sub>	0,272
							$\chi_{22}$	9,04	P <sub>2</sub>	0,003
							$\chi_{32}$	26,34	P <sub>3</sub>	0,0001
Developmental Delay	8	57,1	21	34,4	28	71,7	$\chi_{12}$	2,48	P <sub>1</sub>	0,115
							$\chi_{22}$	1,02	P <sub>2</sub>	0,314
							$\chi_{32}$	13,29	P <sub>3</sub>	0,0001
Skin Itching	7	50	23	37,7	29	74,3	$\chi_{12}$	0,72	P <sub>1</sub>	0,397
							$\chi_{22}$	2,81	P <sub>2</sub>	0,094
							$\chi_{32}$	12,81	P <sub>3</sub>	0,0001
Hepatomegaly	-	-	8	13,1	20	51,2	$\chi_{12}$	2,06	P <sub>1</sub>	0,152
							$\chi_{22}$	11,53	P <sub>2</sub>	0,001
							$\chi_{32}$	17,19	P <sub>3</sub>	0,0001
Splenomegaly	-	-	5	8,1	8	20,5	$\chi_{12}$	1,23	P <sub>1</sub>	0,268
							$\chi_{22}$	3,38	P <sub>2</sub>	0,066
							$\chi_{32}$	3,19	P <sub>3</sub>	0,074

Note: "-" indicates that data is not available for the respective clinical symptom; P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub> - represent the significance of differences in indicators between patients with mild and moderate, mild and severe, and moderate and severe degrees of severity, respectively.

The clinical symptoms also showed a tendency to correlate with the severity of the disease (Table 1).

According to the results of the averaged analysis (n=14) of the biochemical analysis in children with hymenolepiasis, no pathological changes in the indicators were detected. However, in cases of moderate severity of this nosological unit, the biochemical parameters exceeded the normal range.

In the severe stage of the disease, all biochemical indicators in the blood were significantly elevated, including ALT (alanine aminotransferase), which was increased by 1.8 times (p<0.001). This situation indicated that the infectious process exerted its toxic effect on all internal organs.

## 4 Conclusion

In children affected by hymenolepiasis, a convincing imbalance in the state of the T-cell immune system, humoral factors, and cytokine parameters was observed. It was demonstrated that the increase in clinical symptoms of the disease in these patients is directly proportional to the changes in the immune system.

Based on the assessment of the immune and cytokine status of patients with hymenolepiasis, the following parameters were recommended as alternative criteria for immunodiagnostics: CD3+, CD4+, CD8+, CD16+ lymphocytes in the blood, IgE, IL-4, and IFN- $\gamma$  in serum.

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