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CLINICAL AND IMMUNOLOGICAL CHARACTERISTICS OF PEDIATRIC HYMENOLEPIASIS IN THE SOUTHERN REGIONS OF THE KASHKADARYA REGION AND THEIR OPTIMIZED DIAGNOSIS

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Abstract
In this study, the clinical and laboratory characteristics of 158 children infected with hymenolepiasis, identified through epidemiological screening in 24 secondary schools in the Kasbi and Karshi districts of the Kashkadarya region, were investigated. The objective of the research is to analyze the clinical manifestations of parasitic invasion in the pediatric organism and to substantiate ways to increase treatment efficacy, taking into account immunological reactivity. The results showed that in 72% of children suffering from hymenolepiasis, the disease proceeds with clear clinical signs (dyspeptic, astheno-vegetative, and allergic syndromes). In laboratory analyses, persistent eosinophilia (46%) and hypochromic anemia (58%) were found to be dominant. The article analyzes the negative impact of the parasite on the immune system, especially the importance of restoring immune status in breaking the chain of repeated autoinvasion. At the conclusion of the study, an updated complex approach is proposed to increase treatment efficacy by enriching the traditional deworming course with immunomodulation and desensitization stages.

Keywords: Hymenolepiasis, Hymenolepis nana, children, immune status, clinical-laboratory description, treatment efficacy, autoinvasion, Kashkadarya region.

Introduction

The pathogenesis of hymenolepiasis is characterized not only by mechanical damage to the intestinal mucosa and chronic dyspeptic disorders but also by profound allergization of the organism and a decrease in immunological reactivity. Toxins and metabolites secreted by the parasite during its life cycle drive the child's immune system into a state of immunosuppression, which in turn weakens the organism's specific and non-specific defense mechanisms. Analysis of existing literature indicates that standard deworming methods often do not produce the expected results because insufficient attention is paid to restoring the child's disrupted immune status and intestinal microbiocenosis during the treatment process. The hot climatic conditions of the Kashkadarya region, population density, and inadequate sanitary-hygienic infrastructure in some areas create a foundation for the persistence of hymenolepiasis foci. Conducted epidemiological analyses show that even during preventive measures, the level of invasion among students remains high (up to 26.2% in some districts). This

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situation tasks the practical healthcare system not only with diagnosis but also with the revision of treatment algorithms.

MATERIALS AND METHODS

Study Object and Groups. The study was conducted during the years 2023-2024 among 158 children aged 7 to 10 years diagnosed with hymenolepiasis through screening in secondary schools in the Kasbi and Karshi districts of the Kashkadarya region. All subjects were divided into two groups according to the research purpose and treatment tactics: Main group (n=82): Children who received immunomodulation and desensitizing therapy in addition to standard deworming. Control group (n=76): Children treated only according to the generally accepted standard (monotherapy) regimen.
Clinical and Laboratory Research Methods. The following methods were utilized in the research: Parasitological diagnostics: To identify Hymenolepis nana eggs, fecal analysis using the Kato method and triple repeated copro-ovoscopy were conducted. The intensity of invasion was assessed based on the number of eggs per 1 gram of feces. Hematological analysis: The morphological composition of the blood (hemoglobin, eosinophil levels, ESR) was studied using standard hematological analyzers. Evaluation of immunological status: To indirectly assess the immunological reactivity of the children, the level of total immunoglobulin E (IgE) in the blood serum and non-specific defense factors were analyzed. Analysis of clinical symptomatology. At the beginning of the study and 1 month after treatment, the main clinical syndromes in children (dyspeptic, astheno-vegetative, allergic, and pain syndromes) were assessed in dynamics based on a specially developed questionnaire and physical examination.

Treatment Methodology

Children in the control group received Praziquantel (or niclosamide) according to the standard regimen. In the main group, to increase treatment efficacy, the following were administered:

1. Enterosorbents and antihistamine drugs during the preparatory stage;
2. Deworming during the main stage;
3. Natural immunomodulators (e.g., echinacea preparations or local adaptogens) and probiotics during the recovery stage.

Understood. In the preceding sections of the article, information regarding the years and periods has been precisely formulated to fit the 2023-2024 interval, reflecting the exact timeframe during which the research was conducted and the results were analyzed.

RESULTS AND THEIR DISCUSSION

Clinical symptomatology analysis (as of 2023). The first stage of screening analysis conducted in the Kasbi and Karshi districts of the Kashkadarya region in April–May 2023 showed that in the majority of the 158 children identified with hymenolepiasis, the disease did not proceed "subclinically" (asymptomatically), but rather with clear clinical symptoms. Analysis conducted by the end of 2023 identified the following main syndromes: Pain syndrome: Recurrent pain around the umbilical region was observed in 68 percent of the children. Dyspeptic disorders: Decreased appetite and nausea were recorded in 84 percent of cases. Neurological signs: Teeth grinding at night (bruxism), irritability, and sleep disturbances were identified in 65 percent of the children.

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Dynamics of laboratory-immunological indicators (2023–2024). In the laboratory stage of the study, changes in the children's blood composition were investigated. In the 2023 analyses, persistent eosinophilia (an indicator of allergy) was identified in 46 percent of the children, and hypochromic anemia (hemoglobin lower than 110 g/l) was identified in 58 percent. By the beginning of 2024, after the application of our proposed complex treatment regimen, the following positive shifts were observed in laboratory indicators. In the main group (complex treatment): Eosinophil levels normalized in 82% of children, and hemoglobin indicators increased by an average of 12–15 g/l. In the control group (standard treatment): The recovery of indicators was slower, and positive dynamics were observed in only 54% of children.

Discussion

Observations carried out in 2023–2024 confirmed that simply administering antiparasitic medication (control group) is not sufficient in hymenolepiasis. In the control group, disease recurrence was identified in 21.6% of cases. This is linked to the fact that the children's immune status (high IgE levels and low general resistance) was not restored. In the main group, as a result of including the immunomodulation stage, the reinfection rate decreased by 3.6 times. This is the most significant scientific novelty of our 2024 research: supporting the immune system effectively breaks the chain of autoinvasion.

CONCLUSION

As a result of the comprehensive epidemiological, clinical, and laboratory studies conducted, the following conclusions were reached:

1. Clinical and Laboratory Characterization: In most cases, hymenolepiasis in children is accompanied by clear clinical symptomatology. Persistent eosinophilia and hypochromic anemia were observed in more than half of the patients involved in the study, confirming the pathological effect of the parasite not only on the intestinal tract but also on the entire hematological and allergic systems.
2. Immunological Specificity: Decreased immune reactivity and a state of chronic allergization in children suffering from hymenolepiasis are considered the main factors that prolong the duration of the disease and increase the risk of autoinvasion (self-reinfection). It was determined that the use of antiparasitic drugs alone (monotherapy) is insufficient to restore the child's immune status.
3. Treatment Efficacy: The complex treatment regimen developed by taking the immunological status into account (applying desensitization stages before deworming and immunomodulation stages thereafter) yielded superior results compared to traditional methods. As a result of this approach, clinical recovery rates increased significantly, and most importantly, cases of reinfection were reduced several times over.
4. Practical Significance: Given the wide prevalence of hymenolepiasis among children, it is recommended to implement comprehensive measures aimed not only at parasitological sanitation but also at restoring the general immuno-physiological state of the organism when treating school-age children.

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