

Improving diagnostic and therapeutic approaches to giardiasis in children

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Abstract.

Background: Giardiasis remains one of the most common intestinal protozoal infections in children and continues to pose important diagnostic and therapeutic challenges because of intermittent cyst excretion, overlap with other gastrointestinal disorders, and frequent relapse after standard short-course treatment. **Aim:** To improve the diagnostic algorithm and optimize treatment strategies for giardiasis in pediatric patients. **Methods:** A prospective clinical study included 105 children aged 5-13 years. Diagnostic verification was performed using clinical assessment, stool microscopy, repeated coproscopy, and enzyme-linked immunosorbent assay (ELISA). In the therapeutic phase, 60 patients with confirmed mono-giardiasis were treated using three different regimens: metronidazole plus nifuroxazide, albendazole monotherapy, and a structured three-stage complex therapy. **Results:** Giardiasis as mono-infection or combined invasion was identified in 80.0% of examined children. ELISA was positive in 89.0% of cases but yielded 8.9% false-positive results. A single coproscopic examination detected giardiasis in only 55.5% of infected children, whereas repeated stool examination performed 3-5 times over 2 weeks reached 100% detection among children with positive ELISA and verified infection. The best treatment outcome was observed in the three-stage group, with 91.7% eradication after one course and only 2.5% recurrence after 12 weeks. **Conclusion:** ELISA is useful as a screening method but should be combined with repeated coproscopy for definitive diagnosis. A stepwise therapeutic approach incorporating antispasmodics, ursodeoxycholic acid, lactulose, and albendazole appears to be the most effective strategy for eradication and prevention of recurrence.

Key words: giardiasis; children; diagnostics; ELISA; coproscopy; albendazole; ursodeoxycholic acid; recurrence prevention.

1. Introduction

Giardiasis is a protozoal intestinal disease caused by *Giardia lamblia* and remains one of the most frequent parasitic infections in childhood. The parasite colonizes the mucosa of the upper small intestine and can induce abdominal pain, nausea, meteorism, unstable stool, malabsorption, hepatobiliary dysfunction, and delayed physical development. In children, the disease often has a polymorphic clinical course and may imitate functional bowel disorders, food intolerance, allergic syndromes, or chronic inflammatory pathology of the digestive tract.

Global epidemiological observations indicate that giardiasis is especially common in low-resource settings, in overcrowded households, and in organized children's collectives where the fecal-oral route of transmission is facilitated. Infection may spread through contaminated water, food, hands, or household items. This explains why school-aged children remain one of the most vulnerable categories. In several regional studies from Uzbekistan, a high prevalence of giardiasis among schoolchildren has been reported, indicating that the disease remains a relevant public health problem.

Despite the apparent simplicity of laboratory diagnosis, accurate verification of giardiasis is often difficult in routine practice. Stool microscopy is widely used because of its accessibility, but the sensitivity of a single examination is limited by intermittent excretion of cysts. Serological methods, including ELISA, are more sensitive and operationally convenient but may produce false-positive results because antibodies can persist after prior exposure and do not always reflect active invasion. In the absence of an adequate algorithm, clinicians may either miss infection or prescribe unnecessary treatment.

Another unresolved problem concerns therapy. Conventional antiprotozoal regimens are not always sufficient to ensure stable eradication. Children with giardiasis frequently have associated biliary dyskinesia, intestinal spasm, microbiota disturbance, and impaired evacuation of intestinal contents, all of which may reduce treatment effectiveness and favor recurrence. As a result, the search for a more rational and staged therapeutic approach remains clinically justified.

The aim of this study was to compare diagnostic methods for giardiasis in children, determine the role of repeated stool microscopy after ELISA screening, and evaluate the effectiveness of different treatment strategies with emphasis on prevention of recurrence.

2. Materials and methods

A prospective clinical study was carried out in 105 children aged 5-13 years. Of them, 95 were attending organized educational institutions and 10 were not. All participants underwent a standardized clinical examination with analysis of epidemiological history, gastrointestinal complaints, duration of symptoms, possible household contacts, and signs suggestive of intestinal parasitosis.

Laboratory diagnosis was performed using parasitological and serological methods. Coproscopy of stool samples was carried out initially as a single examination. Because intermittent excretion of *Giardia* cysts is common, children with suspected infection were subsequently investigated by repeated stool microscopy from 3 to 5 times over a 2-week period. ELISA was used as a screening test. Diagnostic performance was evaluated by comparing the findings of ELISA, single coproscopy, and repeated coproscopy with the final verified diagnosis.

For the therapeutic analysis, 60 patients with confirmed mono-giardiasis were selected. This phase also included infected adult family members when relevant for household treatment strategy, but the primary outcome interpretation focused on the pediatric cohort. The patients were divided into three groups according to treatment regimen. Group I included 22 patients who received metronidazole for 5 days plus nifuroxazide for 10 days. Group II included 21 patients treated with albendazole monotherapy at 400 mg once daily for 5 days. Group III included 17 patients treated with a three-stage complex regimen.

The preparatory stage of the three-stage regimen consisted of dietary modification with limitation of rapidly absorbed carbohydrates and dairy products, together with an antispasmodic and ursodeoxycholic acid at 10 mg/kg for 1-2 weeks before antiparasitic treatment. The second stage included albendazole 400 mg once daily for 5 days combined with antispasmodic therapy, ursodeoxycholic acid, and lactulose in a laxative dose adjusted to response. The recovery stage continued antispasmodic support for 1 week, ursodeoxycholic acid at 10 mg/kg at night for 2-4 weeks, and lactulose in a prebiotic dose for 2-4 weeks.

The rationale for this treatment model was based on correction of intestinal and biliary dysfunction before and after specific antiparasitic exposure. Antispasmodics were used to normalize motility and reduce pain syndrome, ursodeoxycholic acid to improve bile composition and bile flow, and lactulose to promote intestinal sanitation and microbiota recovery. Albendazole was selected as the main antiparasitic drug because of high anti-*Giardia* activity and acceptable tolerability.

The primary treatment endpoint was parasitological sanitation after one course, evaluated using repeated three-time coproscopy. The secondary endpoint was recurrence within 12 weeks after treatment. Statistical interpretation was based on descriptive analysis, and clinically relevant between-group differences were noted when recurrence differences reached $p < 0.001$.

3. Results

Among 105 examined children, giardiasis as mono-infection was detected in 55.5% of cases. Combined enterobiasis and giardiasis were found in 17.8%, isolated enterobiasis in 14.0%, and enterobiasis together with giardiasis and hymenolepiasis in 5.2%. In 7.5% of children no intestinal parasitosis was identified. Therefore, giardiasis either alone or in combination with other parasitic diseases was verified in 84 of 105 patients, corresponding to 80.0% of the sample.

Serological screening by ELISA produced positive results in 90 of 105 children, which corresponds to 89.0%. However, because final verification confirmed giardiasis in 84 children, 7 cases represented false-positive ELISA findings. This indicates that ELISA has high sensitivity, making it appropriate for primary screening, but does not provide sufficient specificity for definitive diagnosis when used in isolation.

A single coproscopic examination identified giardiasis in only 50 patients, equivalent to 55.5% of infected children. Consequently, a large proportion of real cases would have remained undetected if diagnosis had been based on a one-time stool examination. Repeated coproscopy performed 3-5 times over 2 weeks confirmed giardiasis in 80 children and reached 100% detection among those with positive ELISA and true infection. At the same time, 10 children with negative ELISA results also had negative repeated coproscopy, which supports the value of combining the two methods in sequence.

Analysis of treatment effectiveness showed substantial differences between regimens. In Group I, sanitation after one course was achieved in only 30.0% of patients. In Group II, albendazole monotherapy improved the result to 75.0%. The highest effectiveness was documented in Group III, where the complex staged regimen produced 91.7% eradication

after one course.

Recurrence after 12 weeks was observed in 35.1% of Group I and 35.0% of Group II patients. In contrast, recurrence in Group III was only 2.5%, which was significantly lower than in both comparison groups ($p < 0.001$). Notably, recurrence episodes were recorded only among pediatric patients, suggesting that the children's cohort was particularly susceptible to reinfection or incomplete eradication when supportive correction of intestinal and biliary dysfunction was absent.

Table 1. Comparative therapeutic effectiveness and recurrence rates in the study groups.

Group	Treatment regimen	Eradication after one course	Recurrence after 12 weeks
I	Metronidazole (5 days) + nifuroxazide (10 days)	30.0%	35.1%
II	Albendazole 400 mg once daily for 5 days	75.0%	35.0%
III	Three-stage complex therapy	91.7%	2.5%

4. Discussion

The findings of the present study demonstrate that no single diagnostic test is sufficient for confident verification of giardiasis in children. ELISA showed high positivity and proved useful as a rapid screening method; however, the presence of false-positive results confirms that serology should not be interpreted as the sole criterion of active invasion. In practical pediatric work, this distinction is essential because unjustified antiparasitic treatment may expose children to unnecessary medication without addressing the true cause of symptoms.

The low sensitivity of single coproscopy in this study is consistent with the biology of *Giardia* and the intermittent nature of cyst excretion. Repeated stool examination substantially improved diagnostic yield and, when combined with a positive ELISA screening result, allowed reliable confirmation of the disease. Therefore, the study supports a stepwise diagnostic algorithm: first-line screening with ELISA, followed by 3-5 repeated coproscopic examinations for definitive confirmation.

The therapeutic data are equally important. The very modest effectiveness of the metronidazole-based regimen suggests that empiric short-course treatment without correction of intestinal milieu and biliary dysfunction is often insufficient. Albendazole monotherapy produced clearly better primary sanitation, indicating stronger direct antiprotozoal activity. Nevertheless, the recurrence rate after monotherapy remained high, which suggests that eradication of the parasite alone may not be enough for sustained clinical success.

The best results were achieved with the three-stage complex approach. Its superiority likely reflects not only the antiparasitic effect of albendazole but also the preparatory and restorative measures surrounding drug administration. Improvement of bile flow, reduction of spasm, correction of constipation, and restoration of intestinal microbiota may help eliminate favorable conditions for parasite persistence and reduce the risk of early relapse. This approach appears especially relevant in children with abdominal pain, biliary complaints, unstable stool, or repeated episodes after previous treatment.

From a broader clinical standpoint, these results emphasize the need to view giardiasis not as an isolated parasitological event, but as a disorder with gastrointestinal, biliary, and microbiological components. Household contact management is also important, because untreated family members may serve as a source of re-infection. The staged model described in this study may therefore be useful not only for treatment but also for family-centered prevention of recurrence.

A limitation of the study is the relatively modest sample size of the therapeutic subgroups and the absence of advanced molecular confirmation methods. Nonetheless, the observed differences in eradication and recurrence were substantial and clinically meaningful. Future studies should assess longer follow-up intervals, incorporate standardized symptom severity scales, and compare combined therapy with other modern antiparasitic protocols.

5. Conclusion

The study showed that giardiasis in children is highly prevalent and frequently occurs both as mono-infection and in combination with other parasitic diseases.

ELISA should be considered an effective screening tool, but it must be followed by repeated stool microscopy because serology alone may give false-positive results.

A single coproscopic examination has insufficient diagnostic sensitivity and may miss

a large proportion of true infections.

A structured three-stage treatment strategy including dietary preparation, antispasmodics, ursodeoxycholic acid, lactulose, and albendazole demonstrated the highest eradication rate and the lowest recurrence rate.

Implementation of this combined diagnostic and therapeutic algorithm can improve the quality of pediatric management of giardiasis and reduce relapse in routine clinical practice.

Declarations

Conflict of interest: The author declares no conflict of interest.

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Ethics statement: The work was performed in accordance with accepted institutional clinical and ethical standards.

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References

- [1] Timchenko VI, Levana VV, Abdukaeva NS, Vasiliev VV, Mikhailov IV. Parasitic infestations in pediatric practice. Saint Petersburg: ELBI; 2005. Timchenko V.I., Levana V.V., Abdukayeva N.S., Vasil'yev V.V., Mikhaylov IV. Parazitarnyye invazii v pediatricheskoy praktike. Sankt-Peterburg: ELBI; 2005.
- [2] Bandurina TY, Knoranch GY. Giardiasis in children. Lechashchiy Vrach. 2014;60-62.
- [3] Kramarov SA. Giardiasis: clinical lecture. Sovremennaya Pediatriya. 2025;4:161.
- [4] Kucherya TV, Polushkina MG. Treatment of giardiasis in children under modern conditions: efficacy and choice of a specific drug. Medical Parasitology and Parasitic Diseases. 2023.
- [5] Лямблиоз у детей и взрослых. Клинические рекомендации РФ, 2024. Giamblioz u detey i vzroslykh. Klinicheskiye rekomendatsii RF, 2024.
- [6] Шрайнер Е.В. Оптимизация терапии лямблиоза. РМЖ. 2013;31:1662. Shrayner Ye.V. Optimizatsiya terapii lyamblioza. RMZH. 2013;31:1662
- [7] Kravchenko D.A., Tarasova A.V., Arakelyan R.S., Maslyaninova A.E., Kasatkin D.N., Beshtaov D.H., Artsueva H.B., Akhmarov N.V., Akhmedpashaev G.T. Clinical and epidemiological aspects of giardiasis in children. Health care of the Russian Federation. 2025;69(1):95-100. (In Russ.) <https://doi.org/10.47470/0044-197X-2025-69-1-95-100>. EDN: iwyrpb