CORRECTION OF MICROELEMENT IMBALANCE IN PATIENTS WITH GIARDIASIS

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Relevance of the topic. Giardiasis is a common protozoan parasitic infection caused by Giardia lamblia and remains a significant public health problem worldwide, particularly in developing and transitional countries. The disease affects both adults and children and is transmitted primarily through contaminated water, food, and direct person-to-person contact. Chronic giardiasis is frequently associated with persistent gastrointestinal symptoms, including diarrhea, abdominal pain, bloating, and malabsorption syndrome. Recent studies have demonstrated that parasitic infections are often accompanied by metabolic disturbances and micronutrient deficiencies; however, data on microelement imbalance in giardiasis remain limited and inconsistent. In clinical practice, treatment of giardiasis is mainly focused on eradication of the parasite, while correction of accompanying metabolic disorders is often underestimated. This may partially explain the persistence of symptoms and delayed recovery observed in some patients after standard antiparasitic therapy.

Therefore, comprehensive evaluation of microelement status in patients with giardiasis and the development of effective correction strategies represent an important direction in improving therapeutic outcomes. Studying the dynamics of microelement levels before and after treatment may contribute to a better understanding of the pathophysiological mechanisms of the disease and support the introduction of personalized correction approaches in clinical practice.The aim of this study was to investigate changes in the microelement composition of patients

with giardiasis and to assess the effectiveness of targeted microelement correction as part of complex therapy.

Materials and Methods. This study was conducted as a prospective observational investigation among patients diagnosed with giardiasis who were treated at an infectious diseases clinic. The study included adult patients aged 2 to 12 years with laboratory-confirmed Giardia lamblia infection. The diagnosis was established based on microscopic examination of stool samples and/or detection of Giardia lamblia antigens using enzyme-linked immunosorbent assay (ELISA). Patients who had received antiparasitic therapy or vitamin–mineral supplementation within four weeks prior to enrollment, as well as individuals with chronic liver or kidney diseases, endocrine disorders affecting mineral metabolism, pregnancy, lactation, or severe comorbid conditions, were excluded from the study.All patients received standard antiparasitic treatment according to current clinical guidelines. In cases where microelement deficiency was detected, targeted correction therapy was administered using appropriate mineral supplements at therapeutic doses for a period of 14 days. The selection and dosage of microelements were individualized based on baseline laboratory findings.

Results. The analysis of laboratory findings demonstrated that patients with giardiasis had significant disturbances in serum microelement composition prior to treatment. Following the course of antiparasitic therapy combined with targeted microelement correction, a statistically significant improvement in serum microelement levels was noted. Mean zinc concentrations increased from 8.9 ± 1.2 to 13.6 ± 1.4 µmol/L ($p < 0.05$), while iron levels rose from 9.8 ± 1.5 to 16.2 ± 1.7 µmol/L ($p < 0.05$). Selenium levels also demonstrated a significant upward trend, increasing from 0.62 ± 0.08 to 1.05 ± 0.09 µmol/L after treatment, approaching physiological reference ranges. In contrast, elevated copper levels showed a tendency toward normalization, decreasing from 21.4 ± 2.1 to 17.8 ± 1.9 µmol/L, although in some patients values remained at the upper limit of normal.

Clinical improvement paralleled the laboratory findings. After treatment, patients reported a reduction in gastrointestinal symptoms, including abdominal pain, bloating, diarrhea, and general weakness. The frequency of asthenic symptoms decreased from 72.6% to 18.9%, while appetite improvement was noted in 81.1% of patients. The normalization of microelement status was associated with improved overall well-being and faster recovery of functional capacity.

Conclusion. The incorporation of targeted microelement correction into standard antiparasitic therapy resulted in a more rapid normalization of laboratory parameters and improved clinical outcomes. Patients receiving combined treatment showed faster resolution of gastrointestinal and asthenic symptoms, as well as higher rates of microelement level normalization compared to those treated with antiparasitic therapy alone. These results highlight the importance of routine assessment of microelement status in patients with giardiasis and support the inclusion of microelement supplementation as an integral component of comprehensive treatment strategies. Early identification and correction of microelement deficiencies may improve therapeutic effectiveness, reduce the risk of prolonged disease course, and enhance overall patient recovery.

References

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