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Blastocystis infection in a 5-year-old boy – a case report

Blastocytoza u 5-letniego chłopca – opis przypadku

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Abstract

Blastocystis hominis is one of the most common parasites present in the human gastrointestinal tract. Transmission usually occurs via food and water contaminated with cystic forms or via the faecal-oral route. The prevalence of infection is approximately 30–50% in developing countries and about 1.5–10% in developed ones. *Blastocystis hominis* was long considered as a large intestine commensal due to asymptomatic infestation, possibly characterised by temporary or permanent gastrointestinal carrier state, in some cases. Currently, this protozoan is considered pathogenic as symptoms develop in the course of infestation, especially in infected immunocompromised individuals. The importance of *Blastocystis hominis* as a factor responsible for enteral and parenteral symptoms is underestimated in clinical practice, and the infestation with this parasite is underdiagnosed. We present a case of a 5-year-old boy infected with *Blastocystis hominis*, who developed gastrointestinal symptoms and urticaria.

Keywords: *Blastocystis* infection, symptoms, treatment, children

Streszczenie

Blastocystis hominis to jeden z najczęściej stwierdzanych pierwotniaków bytujących w przewodzie pokarmowym człowieka. Do zarażenia człowieka dochodzi najczęściej drogą fekalno-oralną lub pokarmową przez zanieczyszczony cystami pierwotniaka pokarm lub wodę. Częstość występowania *Blastocystis hominis* w krajach rozwijających się wynosi około 30–50%, zaś w krajach rozwiniętych – w granicach 1,5–10%. Przez długi okres *Blastocystis hominis* uznawany był za komensala jelita grubego, ponieważ w niektórych przypadkach inwazja może przebiegać asymptotycznie, a cechować ją może przejściowe lub trwałe nosicielstwo w przewodzie pokarmowym. Obecnie jednak pierwotniak uznawany jest za gatunek pasożytniczy, gdyż objawy występują zwłaszcza u osób z obniżoną odpornością, zarażonych tym patogenem. Znaczenie *Blastocystis hominis* jako czynnika odpowiedzialnego za objawy jelitowe i pozajelitowe jest niedoszacowane w praktyce klinicznej, a zarażenie tym pasożytem nie jest w pełni diagnozowane. W pracy przedstawiono przypadek 5-letniego chłopca, u którego zarażenie *Blastocystis hominis* wywołało objawy ze strony przewodu pokarmowego oraz pokrzywkę.

Słowa kluczowe: blastocytoza, objawy, leczenie, dzieci

INTRODUCTION

Blastocystis hominis is one of the most common parasites present in the human gastrointestinal tract⁽¹⁾. A number of morphological forms of *Blastocystis* have been identified: vacuolar, granular, avacuolar, multivacuolar, amoeboid and cystic⁽²⁾. *Blastocystis hominis* infection typically occurs through the faecal-oral route, improperly washed hands, fruits and vegetables as well as through water⁽³⁾. Between 10 and 20 days after infection, intermediate forms are excreted with faeces to later transform into invasive forms (cysts) in the external environment. The prevalence of *Blastocystis hominis* is approximately 30–50% in developing countries and about 1.5–10% in developed ones⁽¹⁾. This results from the non-compliance with basic hygiene principles as well as food and water contamination with the parasite's developmental forms⁽⁴⁾. In Poland, infections were reported in 1.6% of the residents of Poznań and the adjacent rural areas as well as 10.7% of children staying in the Provincial Specialist Children's Hospital in Olsztyn^(5,6). Since some of the developmental forms of *Blastocystis hominis* were detected in stool samples from healthy individuals, the species was initially classified as a large bowel commensal. Currently, it is considered a parasitic species as the symptoms occur especially in *Blastocystis hominis*-infected immunocompromised individuals⁽⁵⁾. *Blastocystis* infection occurs in both immunocompetent and immunodeficient patients, and the clinical picture depends on the host's immune status⁽⁷⁾. The latest epidemiological research has shown that *Blastocystis* infection causes diarrhea, abdominal pain, chronic constipation, flatulence, chronic gastrointestinal discomfort and urticaria⁽⁸⁾. Infestation symptoms include lack of appetite, excessive intestinal gas, nausea, blood in stool, malaise, pruritus, painful tenesmus, constipation and allergies⁽⁹⁾. It was also found that *Blastocystis hominis* infection may lead to gastrointestinal diseases, such as irritable bowel syndrome⁽¹⁰⁾. The treatment of *Blastocystis* infection poses difficulty due to a large proportion of asymptomatic infections, which contribute to the spread of *Blastocystis hominis*. Pharmacotherapy is used only in patients with persistent clinical symptoms and a large number of cysts in faeces (>5 of cysts in the field of vision)⁽¹¹⁾. Metronidazole at doses of 750 mg/day for 10 days or 200 mg 4 times a day for 5 days is an effective therapy. Metronidazole doses of 15 mg/kg body weight twice daily for 10 days are recommended for children. Trimethoprim-sulfamethoxazole (TMP-SMX) is a second-choice therapy reserved for patients with metronidazole intolerance or in the absence of response to metronidazole; recommended doses for adults: 320 mg TMP, 1600 mg SMX; recommended doses for children: 15 mg/kg body weight twice daily for 10 days⁽⁹⁾. Some publications indicate beneficial effects of a probiotic (*Saccharomyces boulardii*) in the treatment of *Blastocystis* infection⁽¹²⁾.

CASE REPORT

A 5-year-old boy was admitted to the department due to abdominal pain, periodical urticaria and high serum immunoglobulin E (IgE) for detailed diagnosis. It was found from his medical history that the patient developed abdominal pain, flatulence and urticaria (there were 3 episodes of urticaria during 3 months) about one month before admission. The boy was born at term, with normal birth weight. He was vaccinated according to the current immunisation schedule. The boy was breastfed until 6 months old; no symptoms of food protein allergy were observed. The first hospitalisation took place in the third month of life due to pneumonia, another – in the second year of life, also due to pneumonia. At the age of 2 and 3 years, the boy often developed upper respiratory tract infections and otitis media, which usually required antibiotic therapy. The boy was under the care of the department of otolaryngology and was qualified for adenotomy, which was performed at the age of 3 years, and followed by ear drainage a year later. Since then, the boy has fallen ill only sporadically. He was in a relatively good general condition on admission. Physical examination revealed no abnormalities except for audible silent murmur over the heart (2/6 according to Levine grading system). Due to the reported symptoms, abdominal ultrasonography was performed and showed no abnormalities. Immunochemistry revealed significantly increased total serum IgE (3825 IU/mL, N: <90 IU/mL). The boy was diagnosed for allergies; skin prick tests showed no hypersensitivity to environmental allergens. No IgEs specific for food allergens were detected. The levels of IgG, IgA, IgM and IgG subclasses were within reference range; no disturbance of the oxygen metabolism in neutrophils (Bursttest) was found. Other laboratory parameters, such as urea, creatinine, alanine aminotransferase (ALT), aspartate aminotransferase (AST), gamma-glutamyl transpeptidase (GGTP), antistreptolysin (ASO), were within normal range. Tests for serum antibodies against *Toxocara canis*, *Giardia intestinalis* antigen in faeces and the presence of fungi in faeces were negative. Increased titres of antibodies against *Ascaris lumbricoides* – IgG 17.8 NTU (nephelometric turbidity unit; with the following result interpretation: <9 negative, 9–11 uncertain, >11 positive) and the presence of *Blastocystis* spp. cysts in stool were found. The boy was diagnosed with ascariasis and *Blastocystis hominis* infection. Mebendazole 100 mg 2 times daily for 3 days was included; after 3 weeks, albendazole 400 mg once daily for 3 days (treatment of ascariasis) and, due to persisting symptoms, metronidazole 250 mg 3 times daily for 5 days (treatment of *Blastocystis hominis* infection) were included. The symptoms resolved after treatment.

DISCUSSION

Although symptomatic *Blastocystis hominis* infection is very rare in children, it is important to remember that it may cause persistent symptoms. Our patient was diagnosed

with both *Ascaris lumbricoides* and *Blastocystis* infection. Available studies point to a correlation between the number of developmental forms of the parasite in faeces and the occurrence of symptoms of infection. In most cases, patients with low parasitemia (less than 5 developmental forms in the field of vision) are asymptomatic⁽¹¹⁾. However, some of the studies show that gastrointestinal symptoms, such as abdominal pain, flatulence and constipation, were observed also in patients with low parasitemia. In the presented case report, more than 5 developmental forms of the protozoan were found in the field of vision (40× magnification), thus confirming the aetiology of the presented symptoms. Based on the symptoms and serological testing, the patient was also diagnosed with *Ascaris lumbricoides* infection. Although the diagnosis of ascariasis is based on the detection of adult worms or eggs in the stool, the test may give false negative results, as probably was the case of our patient. Despite low sensitivity of serological methods and the fact that serum antibodies persist for years, a decision was made to initiate treatment of ascariasis due to the clinical symptoms and high IgE levels⁽¹³⁾. The importance of *Blastocystis hominis* as a pathogenic factor responsible for enteral and parenteral symptoms is underestimated in clinical practice, and the infestation with this parasite is underdiagnosed. Currently, *Blastocystis hominis* is considered pathogenic as symptoms develop especially in infected immunocompromised individuals. Furthermore, long-term gastrointestinal infestation disturbs the intestinal microflora, which may lead to a co-infection⁽¹⁴⁾.

Conflict of interest

Authors do not report any financial or personal connections with other persons or organisations, which might negatively affect the contents of this publication and/or claim authorship rights to this publication.

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