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CASE REPORT

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Remission of chronic blastocystosis using ciprofloxacin

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Abstract

Blastocystis hominis is a controversial parasite because of its taxonomy and its treatment. In this report, an immunocompetent person with chronic blastocystosis, in whom a series of treatments were used without success, except for the use of ciprofloxaci. Ciprofloxacin could be an antibiotic of choice in chronic blastocystosis.

KEYWORDS

Blastocystis hominis, ciprofloxacin, remission, treatment

1 | INTRODUCTION

Blastocystis hominis is a strictly anaerobic parasite that has been under debate for many years regarding its classification, transmission, and pathogenicity, being found in different animals such as birds, reptiles, and mammals, for which it is considered a zoonosis.[1,2] Antibiotics, such as ampicillin, streptomycin, and gentamicin, have no apparent effect on the growth of *B. hominis*.[3,4] The forms in which *B. hominis* is reported are vacuolar, granular, amoeboid, and cystic, being the vacuolar form the most reported in coprological samples of clinical cases,[3,5] and the transmission of the parasite is mainly by the oral-fecal route.[6]

The treatments used include metronidazole, furazolidone, and trimethoprim-sulfamethoxazole.[6–9] However, studies highlight, among the drugs, metronidazole alone, and, in some cases, metronidazole with some other drug combinations such as cotrimoxazole (with complete recovery), paromomycin (with the disappearance of symptoms), or cotrimoxazole followed by paromomycin (with the disappearance of symptoms 10 days after treatment).[10–12] Treatment is important in cases of blastocystosis to reduce symptoms or, at best, to achieve remission, especially in chronic diarrhea, weight loss, and fatigue, which can even cause a non-specific, allergic toxic reaction in the colon section that, in some cases, can lead to ulcerative colitis.[13]

Regarding research on this parasite, which is not specific to a single host and is transmitted mainly by oral-fecal route, in Peru, studies have been conducted on the prevalence in children, culture methods, and the interaction between *Trichomonas hominis* and *B. hominis*, which may provide a basis for the high prevalence of parasites in the pediatric population and the importance of culture methods to study the biology of the parasite. These contributions to such an enigmatic organism whose biology, pathogenic role, or treatment is still not well defined are significant.[14–17]

2 | CASE REPORT

A 39-year-old patient started with a clinical condition of liquid diarrhea, without blood or mucus, leukocytes, or inflammatory reaction, with negative studies for adenovirus, rotavirus, and *Campylobacter* sp., and negative for parasites, including *Cryptosporidium* sp.; urine examination without pathological indicators. In October 2019, the patient started having diarrhea 3 to 5 times a day, especially after ingesting food. The clinical condition continued developing for about 1 year and 7 months, triggering acute stomach pains, fatigue, and weight loss in the patient. Two months after the onset of the clinical condition, 3 serial samples were sent to a private

laboratory on two occasions, with negative results for parasites. In addition, a stool culture was performed to determine pathogenic enterobacteria, with negative results. The leukocyte count was 7.7×10^3 (4×10^3–11×10^3), segmented 64% (42%–72%), lymphocytes 24% (20%–51%), 9 monocytes 7% (0%–12%), eosinophils 4% (0%–5%), basophils 15 (0%–1%), hemoglobin 15.2 g/dL (12 g/dL–17.2 d/dL), R.D.W (anisocytosis index) 12.6 (11.5–14), platelet count 311×10^3/mm^3 (150×10^3–450×10^3/mm^3), urea 27 mg/dL (20 mg/d–50 mg/dL), creatinine 1 mg/dL (0.4–1.4 mg/dL), pyruvic transaminase 34 U/L (0–1.4 U/L), and oxaloacetic transaminase 33 U/L (0–40 U/L). A serial sample was sent to a .private laboratory of a parasitologist, identifying *B. hominis* in the cyst and trophozoite forms (vacuolar and granular), between 1 and 3 parasites per field in reading at 400× (Figure 1). The treatments indicated, at that time, chronologically were as follows: two series of Ivermectin 6 mg, at 1 drop/kg (a maximum of 50 drops); 3 series of Metronidazole 500 mg every 8 h, for 7 days; 2 tablets of Nitazoxanide 1 g every 12 h, for 3 days; Albendazole 400 mg in a single dose, without clinical remission and observing 2 parasites/field, among cysts and trophozoites, in a serial sample. Since 11/14/2020, the treatment started again with Metronidazole 500 mg/8 h for 10 days, Nitazoxanide 500 mg/12 h for 3 days, Cotrimoxazole 800/160 mg twice a day for 5 days, without remission and finding between 1 and 2 parasites/field, among cysts and trophozoites. Interestingly, along with *B. hominis*, a large number of motile bacilli and microscopic unicellular organisms compatible with *Trichomonas hominis*, smaller than *B. hominis* and very motile, were observed in fresh samples (Figure 2). Finally, on 04/05/2021, ciprofloxacin 500 mg/12 h for 10 days was indicated, with remission of the clinical condition and no parasites observed at the third serial microscopic reading.

3 | DISCUSSION

In our study, the parasite, between 15 µm and 29 µm, approximately, in granular form, was observed, as previously reported.[18] It has already been reported that this parasite can vary its morphology, depending on environmental conditions such as osmotic value, food metabolites, and drugs.[7,19] One study showed, through endoscopy, a normal upper gastrointestinal epithelium, although it cannot be ruled out that other agents may be involved in the physiopathology, where the inflammatory process is highlighted.[20–22] The patient suffered fatigue, flatulence, diarrhea, abdominal pain, and discomfort, which are clinical aspects previously reported.[23,24] The parasite was just found in the third attempt, through a serial methodology, in which an experienced parasitologist intervened and found the form of cyst and trophozoites, so it is always recommended that serial microscopic examinations be performed by an expert.[25,26] Treatment is controversial. Although some do not recommend treatment, others do recommend the use of anti-protozoal, antifungal, and antibacterial drugs.[9,27,28] Additionally, a diet regimen is recommended to improve the patient's health.[29] Another aspect of utmost importance is the change in the intestinal microbiome that could be related to the patient's symptomatology.[29,30] Ciprofloxacin is an antibiotic used to treat Gram-negative bacteria that may cause infections of the upper respiratory tract, urinary tract, genital tract,

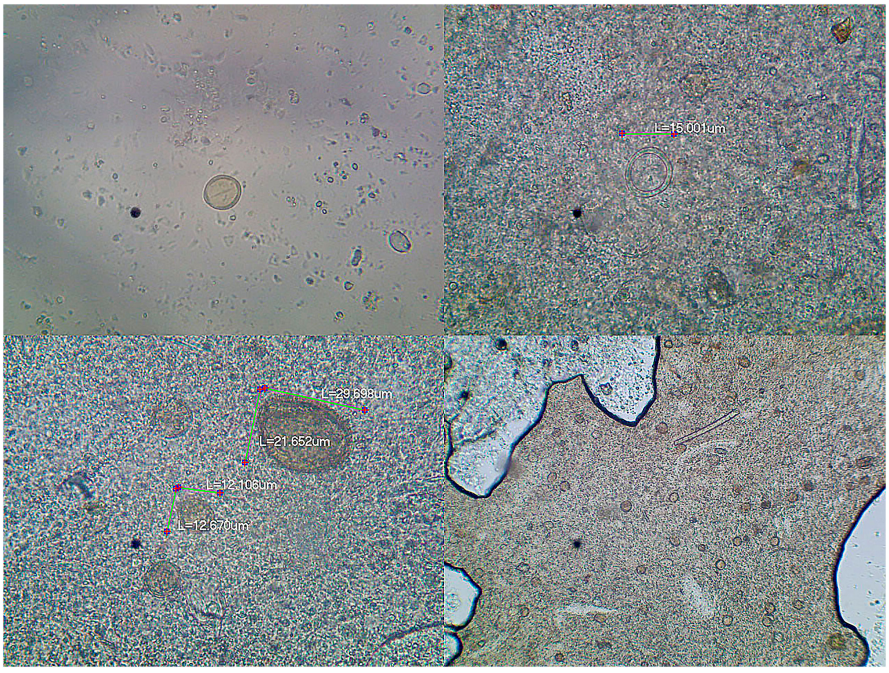

FIGURE 1 From left to right, from top to bottom. Trophozoite of *Blastocystis hominis* in its vacuolar form and a cyst in the corner on the right at 400×; on the upper right, trophozoite of *B. hominis* of 15 µm approximately at 400×; on the lower left, trophozoite in a granular form of 12 µm approximately, and giant trophozoite of 29 µm approximately at 400×, and, on the lower right, finally, a high density of trophozoites of *B. hominis* at 100×.

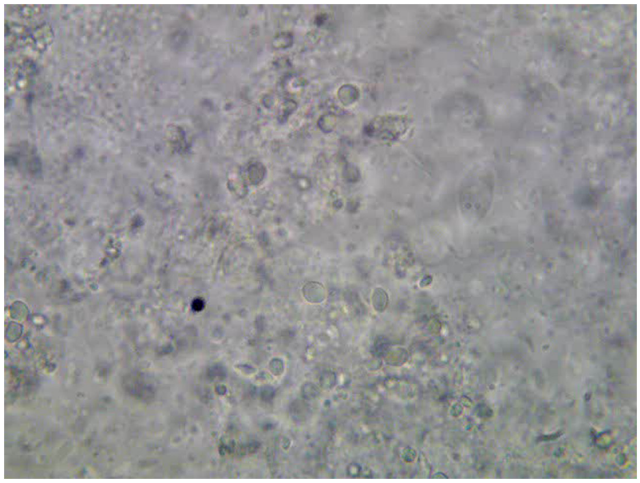

FIGURE 2 Parasites compatible with *Trichomonas hominis* and highly motile bacilli are observed at 1000×.

gastrointestinal tract, and intra-abdominal cystitis. Its use in the case of blastocystosis is rare, with no definite effect, according to very few studies that mention it, where its effectiveness against the parasite was not shown either in vivo or in vitro.[31–33] In contrast, in our study, ciprofloxacin at 500 mg/12 h for 10 days was effective at both clinical and laboratory levels, which suggests that the effect may be indirect against the microbiome, particularly on Gram-negative bacteria, which were observed in large numbers and high mobility in the patient's fresh samples.

It is also important to highlight the role of diet. According to an in vivo study, infection by *B. hominis* would reduce the activity of the lactase enzyme, mediated by an inflammatory process that would provoke lactose intolerance.[34] Moreover, moderate and high parasite loads, as well as adherence to the intestinal epithelium, cysteine proteases, apoptosis, proinflammatory cytokines, and alteration of the intestinal microbiome would be related to symptomatology caused by the inflammatory microenvironment.[35–37]

4 | CONCLUSION

Therefore, it is concluded that the use of ciprofloxacin should be considered as one of the treatments for *B. hominis* in cases of chronic blastocystis, and its effect on the microbiome and/or the subtype of the parasite should be elucidated in future studies.

AUTHOR CONTRIBUTIONS

Jesús Rojas Jaimes: Conceptualization; data curation; formal analysis; investigation; methodology; writing – original draft; writing – review and editing. **Eduardo Vesco- Monteagudo:** Investigation; supervision; validation; writing – review and editing.

FUNDING INFORMATION

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no competing interests.

DATA AVAILABILITY STATEMENT

All data and materials are available in the study.

ETHICAL APPROVAL

The study was carried out respecting confidentiality. The study was developed respecting the confidentiality and the rights of autonomy, charity and justice of the patient.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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