Pathogenicity of Blastocystis hominis, A Clinical Reevaluation

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SUMMARY: Blastocystis (B.) hominis was considered to be a member of normal intestinal flora in the past, but in recent years it has been accepted as a very controversial pathogenic protozoan. In this study, 52 individuals whose stool examination revealed B. hominis were evaluated for clinical symptoms. Metronidazole was administered for 2 weeks to the patients infected with B. hominis. After 2 weeks of treatment they were called for a follow-up stool examination. No other bacteriological and parasitological agents were found during stool examination of these patients. The frequency rate of intestinal symptoms was 88.4% in the B. hominis cases. Abdominal pain was the most frequent symptom (76.9%). Diarrhea and distention followed at a rate of 50.0% and 32.6%. Intestinal symptoms may be seen frequently together with the presence of B. hominis and this protozoan may be regarded as an intestinal pathogen, especially when other agents are eliminated.

Key Words: Blastocystis hominis, symptoms, pathogenicity

INTRODUCTION

Blastocystis hominis is a unicellular protozoan and one of the most common parasites found in the human intestinal tract. It was first described in the medical literature by Alexeieff and was considered as a harmless yeast at that time. But B. hominis is now getting acceptance as an agent of human gastrointestinal diseases (5, 9, 10). B. hominis is accepted in agents of toxigenic and asymptomatic individuals was evaluated as a possible cause of gastro-intestinal troubles (5).

As well as B. hominis is accepted in agents of tourist diarrhoea, it can cause persistent or recurrent diarrhoea in patients with AIDS and other immunodeficiencies (3, 17). It is also reported that it can be seen in nosocomial diarrhoea cases (1). Infection with B. hominis has a worldwide distribution and occurs in both children and adults. The incidence of B. hominis in different regions is reported to be between 2-65% (4, 7). It has been reported that while B. hominis is being detected in 15-20% of acute gastroenteritis cases with direct microscopic investigation, detection rates can reach to 65% with Trichrome stain (8). Watery diarrhoea, abdominal pain, meteorism, lack of appetite and constipation are reported symptoms that may be present in the patients with B. hominis in stool examination (7, 10). At present, the first choice of chemotherapeutic agent is Metronidazole as described in the literature (9, 10).

In this study, carried out in the parasitology laboratory of Suleyman Demirel University Medical Faculty, 52 patients from whom B. hominis was detected in stool samples, were
evaluated to clarify the clinical findings and pathogenicity of these protozoa. Bacteriological and parasitological examination of these stool samples revealed no other microorganism to be responsible for the clinical symptoms.

MATERIAL AND METHODS

Fifty two individuals whose stool examination made in our parasitology laboratory revealed only B. hominis were enrolled and evaluated for clinical symptoms. The patients whose stool examination revealed other pathogenic agents beside B. hominis were excluded. Patients with B. hominis in stool examination were 22 male, 30 female with a mean age of 38.8±20.2 (range 3-61). Anamnestic history of the patients was noted in detail. None of the patients were immunocompromised. Three consecutive stool specimens were examined. The obtained material was first evaluated macroscopically. Later, stool specimens were investigated for intestinal parasites microscopically by using a wet mount (fresh and lugol), modified formol acetate concentration method and trichrome and Kinyoun acid-fast stain methods (6). Presence of more than 5 B. hominis in 40x magnification field was taken as a criterion for the presence of the protozoan. For the bacteriological examination, stool samples were inoculated on to blood agar, eosin methylene blue agar, Thiosulfate-citrate-bile salts-sucrose (TCBS) agar and on to xylose lysine deoxycholate and Salmonella-Shigella agar after enrichment in Selenit F buyyon. Clostridium difficile toksin A was investigated in these stool specimens with C. difficile toksin A test (Oxoid Ltd, UK). In addition, leucocyte counts of stool specimens were determined microscopically.

Metronidazole was administered to the patients with B. hominis for 2 weeks. After 2 weeks of chemotherapy they were called for control stool examination.

RESULTS

Abdominal pain was the most frequent symptom (76.9%). Diarrhoea and distention followed it with a rate of 50% and 32.6%. Other symptoms and their frequency rates are given on table 1. Intestinal symptoms (abdominal pain, diarrhoea and distention) were not in 46 (88.4%) of 52 B. hominis detected patients. A second stool specimen was obtained from 41 (78.8%) of 52 patients after metronidazole therapy. The consecutive parasitological investigation revealed no intestinal protozoa in 39 (95.1%) of 41 B. hominis positive stool specimens. Intestinal symptoms, except diarrhoea persisted in remaining 2 patients. Clinical symptoms disappeared in 36 of 39 (92.3%) patients whose consecutive stool examinations revealed no intestinal parasites. 39 of 46 B. hominis positive patients with intestinal symptoms were evaluated after metronidazole therapy. Intestinal symptoms disappeared in 36 (92.3%) of them. Of 26 patients who complained of diarrhoea, 24 attended for control examination and all of them showed improvement in their clinical symptoms with no intestinal parasites in their stool examination.

Fecal leukocyte counts of patients with B. hominis are given on table 2. While diarrhoea was present in all of 21 patients whose stool examination revealed 1 or more leukocyte on every 100x field, it was detected in only 5 of 31 patients with rare or no leukocytes. Leukocyte count in stool examination was found to be statistically associated with presence of diarrhea (p<0.0001, Fisher’s Exact Test).

Table 1. Frequency of symptoms in patients with B. hominis detected in stool examination and clinical response rates after metronidazole therapy

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Patients (n=52)</th>
<th>Follow-up Patients (n=41)</th>
<th>Clinical response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intestinal symptoms</td>
<td>88.4 n=46</td>
<td>39 n=36</td>
<td>92.3 n=36</td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>76.9 n=40</td>
<td>31 n=28</td>
<td>90.3 n=28</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>50 n=26</td>
<td>24 n=24</td>
<td>100 n=24</td>
</tr>
<tr>
<td>Distantion</td>
<td>32.6 n=17</td>
<td>12 n=11</td>
<td>91.6 n=11</td>
</tr>
<tr>
<td>Urticaria</td>
<td>5.7 n=3</td>
<td>2 n=1</td>
<td>50 n=1</td>
</tr>
<tr>
<td>Perianal pruritus</td>
<td>5.7 n=3</td>
<td>2 n=1</td>
<td>50 n=1</td>
</tr>
<tr>
<td>Constipation</td>
<td>3.8 n=2</td>
<td>2 n=1</td>
<td>50 n=1</td>
</tr>
<tr>
<td>Loss of weight</td>
<td>3.8 n=2</td>
<td>1 n=0</td>
<td>0 n=0</td>
</tr>
</tbody>
</table>

Table 2. Leukocyte counts of B. hominis detected stool samples

<table>
<thead>
<tr>
<th>Leukocyte count</th>
<th>B. hominis detected stool sample (n=52)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No leukocyte</td>
<td>3</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>rare Leukocyte</td>
<td>28</td>
<td>53.8</td>
<td></td>
</tr>
<tr>
<td>1-2 Leukocyte on every field</td>
<td>9</td>
<td>17.3</td>
<td></td>
</tr>
<tr>
<td>3-4 Leukocyte on every field</td>
<td>12</td>
<td>23</td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION

The pathogenicity of B. hominis is still controversial. The organism is considered at least as a potential pathogen by some, whereas other authors concluded that it is not pathogenic (10, 15, 16). The investigators claiming the pathogenicity of this organism accepted more than 5 B. hominis on every 40x magnification field as pathogenicity criterion (13). El-Shazly et. al indicated that in 23 symptomatic patients, B. hominis represented the only causative parasitic agent. The most common symptoms were diarrhoea (30.4%), abdominal pain (26.1%), flatulence (21.7%), vomiting (13.1%) and fatigue (8.7%). High concentrations of B. hominis were found in symptomatic patients than in asymptomatic ones with statistical significant difference (8.2 cells/100 x field versus 3.8 respectively). The mean number of B. hominis was significantly high in patients complaining of diarrhoea and abdominal pain (5). Our study showed that in patients complaining of diarrhoea, fecal leukocyte counts were as important as number of B. hominis as pathogenity criterion.
Baldo et al reported that in children of the residential institutions and street communities in Philippines among 172 children, the prevalence for B. hominis was 40.7%. This high rate of B. hominis was considered to be because of the poor water quality and sanitation in the shelters (2). In a study in Jordan, stool specimens were collected from 180 patients who presented with acute or persistent diarrhoea and other symptoms. Pathogens and potential enteropathogens were identified from 140 (77.8%) of the patients, 54 of which were B. hominis and 32 of 54 were the only pathogen isolated (11).

Tasova et al have investigated the clinical significance and frequency of B. hominis in patients suffering from hematological malignancy who displayed symptoms of gastrointestinal diseases during the period of chemotherapy-induced neutropenia and in conclusion, they have suggested that B. hominis is not rare (13%) and should be considered in patients with hematological malignancy who have gastrointestinal complaints while being treated with chemotherapy (14).

Dogan N reported presence of intestinal symptoms like abdominal pain, distaction, lack of appetite and diarrhoea in 88 patients with B. hominis, detected in stool examination (4). In a study evaluating the intestinal parasitic infections in children in an orphanage in Thailand, B. hominis was found at the highest prevalence (45.2%). During the investigation, stools of all infected cases were noted for six characteristics including formed, soft, loose, mucous, loose-watery and watery and the symptoms disappeared after chemotherapy (12). In our study, the common symptoms in patients with B. hominis were abdominal pain and diarrhoea. In addition, 39 of 41 B. hominis positive stool samples were detected to be free of B. hominis and all of the patients with diarrhoea recovered after metronidazole therapy.

In our study, intestinal parasites were detected in only 2 of 41 patients with B. hominis infection in consecutive stool examinations after chemotherapy. This is thought to be because of using medicines out of order. Abdominal symptoms improved in 36 (92.3%) of 39 follow-up patients after metronidazole therapy. All of these patients with diarrhoea recovered after metronidazole therapy. So we can put forward this protozoon as possible pathogenic, according to the good response to metronidazole therapy in these patients, but treatment directed at eradication of B. hominis is generally not indicated. In addition, in a symptomatic patient with a positive stool smear for B. hominis, a thorough search should be performed to look for other unrecognized enteric pathogens and non-infectious causes of intestinal symptoms should be carefully excluded. However, in the absence of an alternative explanation, a presumptive treatment with metronidazole may be offered keeping in mind that the resolution of symptoms may be secondary to elimination of unidentified pathogens rather than to the treatment of B. hominis (10).

In conclusion, B. hominis seem to be able to reveal various intestinal symptoms by causing intestinal pathologies alone or with other factors which we do not still know much about. Thus, it will be reasonable to consider them as pathogenic when other possible factors are eliminated.

REFERENCES


