The Effectiveness of Metronidazole, Praziquantel and Co-Trimoxazole on Blastocystis hominis

*Nadham K. Mahdi, M.Sc., Ph.D. **Sarkis K. Strak, F.R.C.P

Abstract:

Objective: To investigate the pathogenicity of Blastocystis hominis in man and its proper chemotherapy.

Methods: Patients who had only Blastocystis hominis and no other parasites or enteric bacteria were allocated into one of three groups. The first group (30 patients) was given metronidazole at a dose of 400 mg three times a day for 5 days. The second group (20 patients) was given praziquantel 40 mg/kg body weight. The third group (60 patients) was given co-trimoxazole at a dose of 320 mg trimethoprim and 1600 mg sulphamethoxazole daily in two equal doses for 5 days. Stool samples of all patients were re-examined for the occurrence of B. hominis at the end of the treatment.

Results: The curative rates among the metronidazole, praziquantel and co-trimoxazole treated groups were 30% (9 out of 30), 0% (0 out of 20) and 90% (54 out of 60) respectively. Of these 54 cases (co-trimoxazole treated group), clinical symptoms disappeared in 45, decreased in 8 and no change was noticed in one patient at the end of treatment. Symptoms persisted in all uncured patients.

Conclusion: Blastocystis hominis is a pathogenic protozoan parasite of human intestinal tract, which should be treated. Co-trimoxazole is found to be a drug of choice in the treatment of blastocystosis.

Introduction: Blastocystis hominis has been re-classified as an anaerobic parasite of man. It was initially thought to be commensal in human beings, but recently it has been shown to be a cause of diarrhea. Others concluded that it is not pathogenic.

Anti-amoebic drugs have been used in the treatment of blastocystosis, but according to our experience, they usually lead to varieties of effects in treating patients. Therefore, a search for pathogenicity and proper chemotherapy is essential.

Patients and methods: Stool samples were collected from 110 outpatients and examined by direct smear method for intestinal parasites in 2001. They were mainly suffering from diarrhea, abdominal pain and flatulence. Stool samples were also cultured for enteric bacteria on MacConkey agar and microorganisms were differentiated on the basis of biochemical assay. Clinically, the symptomatic patients, who had only B. hominis but no other parasites or enteric bacteria, were included in the study.

*Dr. Nadham K. Mahdi, Department of Medicine, College of Medicine, Basrah

**Dr. Sarkis K. Strak, Department of Microbiology, College of Medicine, University of Basrah
Patients were allocated into one of three groups, each group being treated with one of the three drugs. The first group included 30 patients were given metronidazole at a dose of 400 mg three times a day for 5 days. The second group included 20 patients were treated with praziquantel 40 mg/kg body weight, divided in two equal doses 4-6 hours apart. The third group involved 60 patients were given co-trimoxazole at a dose of 320 mg trimethoprim and 1600 mg sulphamethoxazole daily in two equal doses for 5 days. At the end of the treatment, stool samples of all patients were re-examined for the occurrence of *B. hominis*. Patients were also evaluated for the effect of the treatment on their symptoms and for any side effects of the treatment.

Chi-square ($X^2$) was used as a test of significance. Differences were stated as significant whenever the probability (P) was less than 0.05.

**Results:**

Abdominal symptoms of the positive cases are shown in Table 1. The curative rates among the metronidazole, praziquantel and co-trimoxazole treated groups were 30% (9 out of 30), 0% (0 out of 20) and 90% (54 out of 60) respectively (Table 2). The difference between these 3 groups is statistically significant ($X^2 = 7.06; P < 0.05$). Of these 54 cases (co-trimoxazole treated group), clinical symptoms disappeared in 45, decreased in 8 and no change was noticed in one patients at the end of treatment (Table 2). Symptoms persisted in all uncured patients.

All three drugs were well tolerated and no side effects were reported during treatments.

Cost of treatment for each case was recorded in Table 3.

**Discussion:**

These results showed that co-trimoxazole had a very good effects on the cure rate and clinical symptoms. It was superior to metronidazole in the treatment of blastocystosis without side effects.

*Blastocystis hominis* was recovered in 44.1% of patients with diarrhea and other intestinal disturbances in our region. The most frequent symptoms of *B. hominis* infection were diarrhea, abdominal pain and flatulence. Thus, the organism is considered as pathogenic amoebae-like protozoan parasites. It is the most common parasite in the region responsible for diarrhea disease and should be reported during stool examination in order to give the proper treatment. Interestingly, a syndrome of carrier for *B. hominis* was recorded. Also the organism was reported in a case of appendicitis.

*Blastocystis hominis* has been detected among some AIDS patients. Three cases of renal transplant recipients have been infected and given trimethoprim-sulphamethoxazole daily for 15 days; the symptoms subsided although the organisms were detected in the stool 2 weeks later.

In a study done in Turkey by Ok et al. who demonstrated that patients treated with trimethoprim-sulphamethaxazole have recovered from *B. hominis* at a rate of 100%. However, co-trimoxazole is safe to be used among pregnant women. In addition, it is cheaper in term of cost with an excellent cure rate. Thus, more studies are needed to examine the mode of action of co-trimoxazole on *B. hominis*. It is unknown whether the drug has a direct effect on the parasite itself or it may kill the essential intestinal bacteria for the surviving of *B. hominis*.

Primarily, Praziquantel is a drug of choice for schistosomiasis and some cestode. In 1998, the drug has been discovered to have a superior effect on intestinal amoebiasis and giardiasis. But unfortunately, there was no any therapeutic influence on *B. hominis*.

In conclusion, *B. hominis* a pathogenic protozoan parasite for human intestinal tract which should be treated. co-trimoxazole is found to be a drug of choice in the treatment of blastocystosis.
References:
Table 1. Abdominal symptoms in 110 positive patients with *Blastocystis hominis*

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>No. ( % )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diarrhea</td>
<td>78 (70.9)</td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>75 (68.2)</td>
</tr>
<tr>
<td>Flatulence</td>
<td>57 (51.8)</td>
</tr>
<tr>
<td>Constipation</td>
<td>4 ( 3.6)</td>
</tr>
</tbody>
</table>

Table 2. Anti – *Blastocystis hominis* activity of three drugs.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>No. Treated</th>
<th>Cure response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metronidazole</td>
<td>30</td>
<td>9 (30)</td>
</tr>
<tr>
<td>Praziquantel</td>
<td>20</td>
<td>0 ( 0 )</td>
</tr>
<tr>
<td>Co-trimoxazole</td>
<td>60</td>
<td>54 (90)</td>
</tr>
</tbody>
</table>

\[X^2 = 7.06; P < 0.05.\]

Table 3. Estimated cost of treatment for an adult (body weight 60 Kg) against *Blastocystis hominis*.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Cost / patient</th>
<th>Cure rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metronidazole</td>
<td>2000</td>
<td>30%</td>
</tr>
<tr>
<td>Praziquantel</td>
<td>Supplied free</td>
<td>0%</td>
</tr>
<tr>
<td>Co-trimoxazole</td>
<td>1500</td>
<td>90%</td>
</tr>
</tbody>
</table>