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 aday 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 [1-2]. It was initially thought to be commensal in human beings, but recently it has been shown to be a cause of diarrhea [3-6]. Others concluded that it is not pathogenic[7-9].

Anti-amoebic drugs have been used in the treatment of blastocystosis [10-11], 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.homiis* but no other parasites or enteric bacteria, were included in the study.

***Dr. Nadham K. Mahdi, Department of Medicine , College 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 doss 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-sequare (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 [12]. 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 [12-16]. 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 [12] . Interestingly, a syndrome of carrier for *B.hominis* was recorded [17] . Also the organism was reported in a case of appendicitis [18] .

Blastocystis hominis has been detected among some AIDS patients [19] . 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 [20] .

In a study done in Turkey by Ok *et al* [21] 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 cestod [22]. In 1998, the drug has been discovered to have a superior effect on intestinal amoebiasis and giardiasis [23]. 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:

1. Zierdt CH, Rude WS, Bull BS. Protozoan characteristics of *Blastocystis hominis* .Am J Clin Pathol 1967; 48: 495-8.
2. Zierdt CH, Swan JC. Generation time and growth rate of the human intestinal parasite *Blastocystis hominis.* J Protozool 1981; 28:483-6.
3. Zierdt CH. *Blastocystis hominis* a protozoan parasite and intestinal pathogen of human beings. Clin Biol Newsletter 1983; 5: 579-80.
4. Ricci N, Toma P, Furlani M, et al. *Blastocystis hominis*: a neglected cause of diarrhoea. Lancet 1984; 12: 966.
5. Lebar WD, Larsen EC. Patel K. A febrile diarrhoea and *Blastocystis hominis.* Ann Intern Med 1985; 103: 306-9.
6. Vannatta JB, Admson D, Mullcan K. *Blastocystis hominis* infection presenting as a recurrent diarrhea. Ann Intern Med 1985; 103: 495-9.
7. Sun T, Katz S, Tanenbaum B, et al. Questionable clinical significance of *Blastocystis hominis* infection. Ann J Gastroenterol 1989; 84: 543-7.
8. Markell EK, Udkow MP. *Blastocystis hominis*: Pathogen or fellow traveler? Am J Trop Med Hyg 1986; 35: 1023-6.
9. Rosenblatt JE. *Blastocystis hominis.* J Clin Microbiol 1990; 28: 2379.
10. Zierdt CH, Swan JC, Hosseini J. *In vitro* response of *Blastocystis hominis* to antiprotozoal drugs. J Protozool 1983; 30: 332-4.
11. Miller RA, Minshew BH. *Blastocystis hominis:* An organism in search of a disease. Rev Infect Dis 1988; 10: 930-8.
12. Mahdi NK, Strak SK, Shiwaish SMA. Frequency distribution of intestinal parasites in southern of Iraq with special emphasis on the *Blastocystis hominis.* J Islamic Med Associ 1994; 26: 18-23.
13. Garcia LS, Bruckner DA, Clancy M.N. Clinical relevance of *Blastocystis hominis.* Lancet 1984; 1: 1233-4.
14. Sheehan DJ, Raucher BG, Mckitrick JC. Association of *Blastocystis hominis* with signs and symptoms of human disease. J Clin Microbiol 1986; 24: 548-50.
15. Qadri SMH, Al-Okaili GA, Al-Dayel F. Clinical significance of *Blastocystis hominis.* J Clin Microbiol 1989; 27: 2407-9.
16. Lee M. Pathogenicity of *Blastocystis hominis.* J Clin Micrtobiol 1991; 29: 2089.
17. Mahdi NK, Al-Taha SAR. The efficiency of duodenal asopirate in the diagnosis of parasitosis and candidiasis. Qatar Med J 2003; (in press).
18. Mahdi NK, Ahmed AHA, Al-Fadhil AH. Histopathological and parasitological study on appendicitis in Basrah, Iraq. Basrah J Surg 1996; 2: 42-5.
19. Llibre JM, Tor J, Manterola JM, et al. *Blastocystis hominis* chronic diarrhea in AIDS patients. Lancet 1989; 1: 221.
20. Ok UZ, Cirit M, Uner A, et al. Cryptosporidiosis and blastocystosis in renal transplant recipients. Nephron 1997; 75: 171-4.
21. Ok UZ, Girginkardesler N, Balcioglu C, et al. Effect of trimethoprim-sulpamethaxazole in *Blastocystis hominis* infection. Am J Gastroenterol 1999; 94: 3245-7.
22. Beaver PC, Jung RC. Animal Agents and Vectors of Human Disease. Philadelphia: Lea & Febiger; 1985; P. 267.
23. Mohammed KA, Strak SK, Jawad AM, et al. Effectiveness of praziquantel in treatment of intestinal amoebiasis and giardiasis. Eastern Mediterranean Hlth J 1998; 4: 161-3.

Table 1. Abdominal symptoms in 110 positive patients with *Blastocystis hominis*

Symptoms	No. (%)		
Diarrhea	**78 (70.9)**		
Abdominal pain	**75 (68.2)**		
		Flatulence	**57 (51.8)**
Constipation	**4 (3.6)**		

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

Treatment	No. Treated	Cure response No. (%)
Metronidazole	**30**	**9 (30)**
Praziquantel	**20**	**0 (0)**
Co-trimoxazole	**60**	**54 (90)**

$X^2 = 7.06$; $P < 0.05$.

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

Treatment	Cost / patient Iraqi dinars		Cure rate
Metronidazole	**2000**		**30%**
Praziquantel	**Supplied free**	**(Basrah health**	**0%**
Co-trimoxazole	**1500**	**authority)**	**90%**