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ORIGINAL ARTICLE

Blastocystosis in Iran: Epidemiological characteristics and Clinical manifestations

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ABSTRACT

Context: Previous studies showed that *blastocystis hominis* may lead to some diseases and symptoms such as flatus, diarrhoea, abdominal pain and nausea. But in some others the disease causing effect of this organism has not been determined.
Aims: The goal of this study is to determine the clinical signs and some epidemiological characteristics of blastocystis in the West of Iran in 2004 and 2005.
Settings and Design: The study was a descriptive cross-sectional one.
Methods and Material: The stool samples of 274 cases from Hamedan province (west) of Iran were tested for blastocystis infection. The samples positive for blastocystis were selected. These patients were asked to fill in a questionnaire to gather clinical and socio-demographic information.
Statistical Analysis Used: Chi-square test was used to assess the relationship between variables.
Results: This study has shown that 58 people (21%) were Blastocystis carriers. The most common clinical symptom was abdominal pain (84.5%). It was more common in primary and elementary schools students than in other educational levels. Diarrhoea was observed mostly in cases younger than 10 years and individuals between 11 and 20 years.
Conclusions: This study showed that the prevalence of blastocystis infection in Iran, like other developing countries, is quite high. So, it is recommended to conduct further studies to fully determine its characteristics and consider it as a potential disease- causing parasite in approaching gastrointestinal diseases.

Key-words: Blastocystosis, Epidemiology, Iran.

Key Messages: Blastocystis should be considered as a potential pathogenic agent in approaching gastrointestinal diseases.

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Introduction

Categorically, the place of Blastocystis among unicellular has not been determined until now [1]. Many believed this organism has only one species, but according to recent morphological and molecular studies, there were some instances that suggested the existence of different species of this parasite [2].For many years, scientists believed one species of Blastocystis infected humans, while other species of Blastocystis infected animals. So they called Blastocystis that affect humans *Blastocystis hominis* and named Blastocystis that affects other animals differently, for example *Blastocystis ratti* for rats. Genetic analysis performed in 2005 showed *Blastocystis hominis* does not really exist. There is no unique species of Blastocystis that infects humans. In fact, nine different species of Blastocystis can infect humans, including Blastocystis ratti. A tenth group was identified in China in 2007. As a result of this, in 2007 scientists proposed discontinuing the use of the term *Blastocystis hominis*. Their proposal is to refer to Blastocystis from humans and animals according to the genetic identity of the Blastocystis organism, rather than the host that was infected by it. The disease-causing effects of this parasite have not been determined yet[1]. In many studies,

blastocystis resulted in gastrointestinal problems [2],[3],[4],[5],[6],[7],[8],[9],[10] but in other ones, no clinical manifestations were seen[11],[12]. Blastocystis attack to the intestinal mucus may cause a kind of mucosal ulceration [1]. Different unspecialized clinical symptoms such as diarrhoea, abdominal pain and nausea have been observed in patients affected by this parasite [1],[4],[5],[8],[9],[10]. The prevalence of Blastocystosis in developing countries is more than the developed parts of the world. [12] In general in studies from developed countries its prevalence was reported approximately 1.5 up to 10% [13],[14],[15].

The aims of the current study were to determine the prevalence and clinical manifestations and some epidemiological characteristics of Blastocystis infection in Iran.

Subjects and Methods

The stool samples of 274 cases from Hamedan province (west) of Iran were collected during 2004 and 2005. An informed consent form was signed by each participant (in cases under 18 years old, it was signed by parents). The samples were transferred to the parasitology department of Hamedan University of Medical Sciences for testing. They were tested by direct and formol–ether methods. They were also cultured on the bacterial medium for rejecting bacterial and viral agents in diarrhoea. The samples positive for blastocystis were selected. Patients from these cases were asked to fill in a questionnaire to gather clinical and socio-demographic information. It was a structured one and was filled by educated health-care personnel. In case of children, their parents were asked to provide the required information. Chi-square test was used to assess the relationship between variables. P-values of less than 0.05 were considered as significant.

Results

Among 274 participants, 148 (54.1%) were males. Fifty eight cases (35%) were positive for Blastocystis and 35 (39.7%) of them were females. In [Table/Fig 1] we can see that abdominal pain and diarrhoea were the two most common digestive manifestations in blastocystis infected individuals and constipation was the least one. From an educational point of view, prevalence of blastocystosis in the primary and elementary schools students (45%) was higher than among the University students (6.4%). According to [Table/Fig 2], abdominal pain was more common in 11-20 year old cases (34.5%). Diarrhoea was seen mostly in participants younger than 20 years old. [Table/Fig 3]shows that in both sexes, Blastocystosis was more frequent in cases below 10 years old and the lowest prevalence was seen in people who were older than 30 years of age.

[Table/Fig 1]. Age distribution of clinical symptoms in Blastocystis hominis in west of Iran in 2004-2005.

	Abdominal pain		Diarrhea		Nausea		Vomiting		Other Symptoms	
	Number	%*	Number	%*	Number	%*	Number	%*	Number	%*
1-10 years	19	32.7	4	6.9	3	5.2	3	5.2	7	12.1
11-20 years	20	34.5	4	6.9	3	5.2	1	1.7	5	8.6
21-30 years	8	13.8	1	1.7	2	3.4	0	0	2	3.4
>30 years	2	3.4	1	1.7	0	0	0	0	2	3.4
Total	49	84.5	10	17.7	8	13.8	4	6.9	16	27.5

* Of the 58 total cases.

[Table/Fig 2]. Sex distribution of clinical symptoms in Blastocystis hominis in west of Iran in 2004-2005.

	Abdominal pain		Diarrhea		Nausea		Vomiting		Corixa		Anorexia		Constipation	
	Number	%*	Number	%*	Number	%*	Number	%*	Number	%*	Number	%*	Number	%*
Men	29	50	7	12.1	6	10.3	3	5.2	3	5.2	1	1.7	0	0
Women	20	34.5	3	5.2	2	3.4	1	1.7	0	0	3	5.2	2	3.4
Total	49	84.5	10	17.3	8	13.7	4	6.9	3	5.2	4	6.9	2	3.4

* Of the 58 total cases.

[Table/Fig 3]. Age and sex distribution Blastosistis hominis infection in west of Iran in 2004-2005

	1-10 years		11-20 years		21-30 years		>30 years		Total	
	Number	%*	Number	%*	Number	%*	Number	%*	Number	%*
Men	16	45.7	11	31.4	5	14.3	3	8.6	35	60.3
Women	11	47.8	9	39.1	1	4.4	2	8.7	23	39.7
Total	27	46.5	20	34.5	6	10.4	5	8.6	58	100

* Of the 58 total cases.

Discussion

Blastocystis attack on the intestinal mucus may cause a kind of mucosal ulceration. Different unspecialized clinical symptoms such as diarrhoea, abdominal pain and nausea have been observed in patients affected by this parasite. The aims of the current study were to determine the prevalence and clinical manifestations and some epidemiological characteristics of Blastocystis infection in Iran.

The prevalence of blastocystosis in our study was 21%. Previous studies reported that its prevalence in developed countries is less than 10%. [16],[17],[18]. The results from some other studies suggested a prevalence between 11 to 20 percent for this infection [19],[20],[21). But the prevalence of blastocystosis in developing countries and in areas with poor hygienic conditions is high. [12], [22]. Kevin [9] and Mohammad et a1 [10] also in their studies showed that the prevalence of this

parasite in areas with low hygienic conditions is high. In two studies from Jordan and Paraguay the prevalence of blastocystis infection was higher than 20%. [23],[24] Koutslavlis et al [16] describe this parasite common between humans and animals and coming from water and suggested that its prevalence is high in tropical and semi-tropical areas. Our result was in line with the above mentioned study. In other words, the prevalence of blastocystosis like some other intestinal parasites such as ascaris and giardia infection in Iran is high. The reason is probably due to the low level of individual and public hygienic conditions and too much use of herbs (especially because there is a likelihood of contamination as in most market-gardens there is an active use of manure or irrigation by sewage). Blastocystis infection was more in individuals between 1-10 years old (46.5%) than the others. This result is in accordance with the results of some other studies[12],[22]. The prevalence of blastocystosis in men is usually more common. [12] Similarly, we found a higher prevalence in men (60.3%) but the difference was not significant. In the current study, abdominal pain (84.5%) and diarrhoea (17.5%) were the most common intestinal manifestations. Similar results were reported in pervious studies. [4],[12],[25] In this study abdominal pain was the most common problems in age groups of 11-20 years (34.5%) and 1-10 years (32.7%). This may be due to relative immunodeficiency in these ages. Horiki et al [15] showed a significant relationship between immunodeficiency and gastrointestinal manifestations of blastocystosis. On the other hand, it has been shown that in normal adult population with good economic and social status, the prevalence of infection with this parasite and also its clinical manifestations are considerably low [26].

In conclusion, our study showed that the prevalence of blastocystis infection in Iran, like other developing countries, is quite high. So, it should be considered as a pathogenic agent in approaching gastrointestinal diseases.

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