

Study of Epidemiological Factors According to the Positive Response of Igg of Patients Infected with *Blastocystis hominis* in Diyala province, Iraq

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Abstract

Background: *Blastocystis hominis* (*B. hominis*) is the most common intestinal parasite in humans and many other animals. Infections with the organism are spread worldwide and some of them have been asymptomatic, acute symptomatic and chronic.

Materials and Method: 100 blood samples were collected from patients with *B. hominis* which were reviewing to some Hospital and health center in Diyala province during the period from October 2018 to March 2019. To determine the extent of IgG antibody responses in serum patients infected with *B. hominis* for depending on the chromatic changes resulting from the association of antigens with antibodies.

Results: The results of the current study showed the percentage of infection among males was (56.25%) , which is higher than that of females (43.75%), and the age group (3-6) years among males showed the highest rate of infection (33.34%) and the lowest in age groups less from one year and (9-12) years groups at (11.11%). The rate of infection in the age groups(1-3) years and (6-9) years was (22.22%) and in the age group of (1-3) years was the highest incidence among female groups (42.86%), while the age group (3-6) years showed less than that (28.57%) and significant differences at the level of probability less than (0.05). The percentage of *B. hominis* infection increased among the rural population by (56.5%), male infected, (57.14%) female, while the proportion of males among the urban population was (44.44%) and females reached (42.86%), with a standard deviation of (1.600 ± 0.495) and (1.480 ± 0.505) respectively.

Conclusions: The presence of immunoglobulin IgG in serum patients has been shown to stimulate the cellular immune response and be indicative of long-term immunity against pathogenic antigens.

Keywords: *Blastocystis hominis* , diagnosis, parasite, infection, patients.

Introduction

B. hominis is one of the most common protozoa intestinal parasitic diseases worldwide and a common infected among humans and animals^[1]. It isolated from stool specimens appear as unicellul and it has multiple shapes, such as vacuolar, granular, and amoeboid ^[2]. It was considered as harmless yeast, but it is now getting

acceptance as an agent of human intestinal disease especially under immunosuppressive conditions^[3]. The extent research on *B. hominis* is transmission mechanisms, incubation period, epidemiology, and treatment options^[4]. It's status as a true pathogen is controversial - while it has been found in patients with gastrointestinal symptoms with diarrhea or severe abdominal pain. Symptoms associated with human papillomavirus infection include: diarrhea, nausea, colic, abdominal distension, fever and chills. It is not proven to be the cause and many carriers are asymptomatic^[5].

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Diagnosis of *B.hominis* is used by clinical diagnosis of diarrheal symptoms and dehydration of the patient and laboratory methods. Direct microscopy of stool and cystic phase observation overlap with other causatives of diarrhea specially^[6,7]. These data indicate that *B.hominis* induces as well as modulates the immune response in intestinal epithelial cells, and we conclude that different pathophysiological events may occur during *B. hominis* infection. ^[8]. The spread of disease is associated with poor hygiene, exposure to animals and the consumption of contaminated food or water [9] .

Iraq has seen widespread outbreaks of gastrointestinal diseases The Iraqi Ministry of Health and contributed many factors in the spread of the disease, including displacement of people to other places and water pollution. There are several studies that showed prevalence in different Iraqi governorates of the country. The rate of infection was recorded in 2013 (5.08%) for (31) children in Dohook in northern Iraq suffers from gastrointestinal symptoms^[10]. 28 (4.1%) was infected with *B.hominis* from a total of 861 reviewers ^[11]. While in Muthana province in southern Iraq, the infection rate was 58 (45.67%) out of 127 patients infected with *B. Hominis* ^[12]. The aim of the present study is to investigate the most important immunological changes in infected patients by measuring the IgG level, determining positive response rate, age and geuns, and setting up patients.

Materials and Method

Collection of samples

The present study collected 100 cases with *Blastocystis hominis* within the period from October 2018 to March 2019, of 50 male and 50 female, ranged in age less one year to 12 years . It has diagnosed the disease process and determined by dermatologists at some Hospital and health center in Diyala province and the injury was diagnosed based on the clinical symptoms and distinct phenotypic traits of infections.

Serological diagnosis

Serological diagnosis was performed by measuring

the IgG level in the serum of patients with *B. hominis* to determine the response of the positive in the body of the infected patients. Blood samples were collected from patients. Was withdrawn 5 ml of venous blood for each of the infected persons , therapists and control the use of a syringe , put blood samples in test tubes and let the blood to clot at room temperature (20-25) minutes and then the separation of the serum Centrifuge device speeds of (3000) rpm and then it is kept freeze- preserved models when (-20°C) until the subsequent immunological tests.

To find out the most important immunological changes associated with infection in patients with *B. hominis*, the study has included measuring levels of certain cellular dynamics in the serum of infected by and based on the principle of color change resulting from the correlation of quality IgG antibodies and measured color change resulting mediated.

Statistical Analysis

Statistical analysis of the results of the current study using the Statistical Package for Social Sciences conducted (SPSS) metadata. Test was used T-test, variance analysis ANOVA, Chi-square, percentage, standard deviation and standard error in the present study to find a moral differences between groups with infection *Blastocystis hominis* and there were significant differences (P < 0.05).

Results

The present study included 100 patients with *B. hominis*, 50 males and 50 females. The positive response rate of IgG for males was higher than that of females, which recorded positive response rate of (56.25%) at (1.820±0.388) .While the percentage of response to the antibiotic in the serum infected females (43.75%) at (1.860±0.351) . Hence, the statistical analysis of this increase indicates that there isn't a significant difference of statistical significance at the level the probability is less than 0.05 as shown in Table 1.

Table: Effect of the sex factor on the positive serotonin of the IgG antibody of *Blastocystis hominis* for children covered in the infection

Groups	number	Positive response	Percentage%	Mean±SD	Stender Error(SE)	P-value
Boys	50	9	56.25	1.820±0.388	0.055	0.280
Girls	50	7	43.75	1.860±0.351	0.049	
Total	100	16	32%			

Table 2 shows that the injuries spread within a wide range of age groups. The age of those infected was less than 1 to 12 years. In males recorded age groups the (3-6) year age group had the highest IgG response rate at (33.34%) and followed by tow the age groups (1-3) years and (6-9) years (22.22%) and less than at (11.11%) in tow groups less one years and (9-12) years age groups. Compared to the female group, the (1-3) years age group had the highest incidence of IgG infection and response 42.86%.The lowest response among the age group of females was 0.00% in the age group less than one year, so that no percentage is recorded. This is due to the visitors who visit the health centers at the time of collecting samples. While the age group 3-6 years by 28.57% and less than the age groups (6-9) and (9-12) years by (14.29%). Differences between the proportions of m and their response to IgG were statistically significant at the probabilistic level the level the probability is less than 0.05 as shown in Table 2.

Table 2: Distribution of numbers and percentages of infection of *Blastocystis hominis* for the age of the infected and the extent of IgG response

Age groups in years	Number		% Number positive response				P-value
	Boys	Grils	Boys	%	Grils	%	
<1-	5	8	1	11.11	0	0.00	0.028
1-3	4	3	2	22.22	3	42.86	
3-6	7	10	3	33.34	2	28.57	
6-9	12	15	2	22.22	1	14.29	
9-12	22	14	1	11.11	1	14.29	
Total	50	50	9	100.00	7	100.00	

The patients’ place of residence showed a clear difference between their urban and rural residence, but did not constitute a significant difference of statistical significance at the probability of $p > 0.05$. The prevalence of IgG immunoglobulin was significantly higher among urban than in rural areas as table3 showed . The proportion of males was 55.56% of respondents 5

patients of the total number is 20 cases, while females registered 57.143%, with 4 patients of the total number of 26 cases. The response rate in the urban group of infected males was 44.44% with 4 patients of 30 cases, less than 42.857% in urban areas, with 3 patients of the total 24 cases.

Table3: Effect of the living factor on the positive serotonin of the IgG antibody of *Blastocystis hominis* for children covered in the infection

Residence	Number tested		Number positive				P-value
	Boys	Girls	Boys	Percentage %	Girls	Percentage%	
Rural	20	26	5	55.56%	4	57.143	0.182
Urban	30	24	4	44.44%	3	42.857	
Total	50	50	9	100.00%	7		
mean±SD			1.600±0.495		1.480±0.505		
Stander Error(SE)			0.699		0.714		

Discussion

B. Hominis is a protozoan intestinal parasite disease that caused by the emergence of various symptoms, including diarrhea, nausea, abdominal cramps, bloating, excessive gas, and anal itching. The timescale of infection with the parasite can range from weeks to years [13]. The present study showed an increase in IgG and positive response rate in males, with (56.25%) infection rate and (43.75%) female infection as in the table (2). This may be due to the number of hospital-reviewed cases and some male health centers more than females, and therefore dependent on individual immunity. This is consistent with the findings of Nayef *et al.* (2011) which indicated the percentage of male (23.99%) height on females (16.27%) and attributed the reasons for this to the above, attributed the reasons to as exposure to the infection increases with the top of nutrition and increased funding [14]. The percentage of infection between females and males does not make any significant difference at the probability level (0.05), which is consistent with the results of Mahmood and Khudher (2016) Indicating that there is no significant difference between the rates of infection of males and females and accounted for the percentage of infection *B. hominis* in Sammara city - Salah Al-Deen province was (9.09%) [15].

The study showed the effect of the age group in the incidence of *B. hominis*, whose age ranged between (> 1- 12) years with a significant difference of ($P < 0.05$). As it was the highest rate of infection in both genus and is attributed to the lack of development of the immune system in the younger age groups compared to the large age and this is consistent with what Salman (2015), who pointed to a significant difference at level ($P < 0.05$)

between different age groups ranging from 6 months to over 61 years out of a total of (177) patients with *B. hominis* [16]. The main cause of diarrhea is *B. Hominis* among other pathogens, as explained by al-Kaissi and Majdi (2009), the highest proportion of whom were 82 cases with *B. Hominis* isolated from 200 patients suffering from diarrhea by 41% [17]. Where the current study recorded the age group (3 – 9) years is the highest response rate positive for IgG among males infected with *B. hominis*, which amounted to (33.34 %) and the lowest was in the two age groups less than one year and (9-12) years is (11.11%). While the age group (1-3) years among females infected with the highest rate of (42.86%) and less than in the categories of age (6-9) years and (9-12) years is (14.29%), while the category less than a year does not register any case among females and this is due to patients reviewing hospitals and centers When collecting samples as showed in table (2) .

The current study indicates that the housing factor has a difference in the percentage of IgG positive response for patients with *B. hominis* for both sexes but does not register any significant difference at the probability level ($P > 0.05$). The positive response rate for patients with *B. hominis* who live in rural areas is higher than that of urban dwellers. This is due to the pollution of the environment and the environment of the rural inhabitants of *B. hominis*. They may be directly related to the reservoir stocks such as sheep, cattle, cats, dogs and other domestic animals. For rural males (55.56%) of respondents (5) patients of the total number is (20) cases, while females registered (57.143%), with (4) patients of the total number of (26) cases. The response rate in the urban group of infected males was (44.44%)

with (4) patients of (30) cases, less than (42.857%) in urban areas, with (3) patients of the total (24) cases as showed table (3).

Conclusions

The present study conclude that the disease's ability to stimulate the cellular immune response leading to the production of IgG that observed height in patients groups.

Conflict of Interest: None

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Ethical Clearance: Blood sampling was performed from October 2018 to March 2019 with the consent of the reviewing patients to participate in this study. This study was completed.

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