Epidemiology and Clinical Characteristics Associated with Blastocystis Hominis in More Than Ten Years Infections in Wasit Province / Iraq

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Abstract. To assess the prevalence of bowel parasites in patients in Wasit City, Iraq. Already Blastocystis hominis is gaining recognition as an agent of intestinal disease in humans. A cases study was conducted regarding the cause of gastroenteritis in humans. Wet mount preparation and formalin-ether concentration, examination of a total of 300 specimens of stools. (146) persons infected with gastrointestinal parasites infection percentage (48.67 %). 103 (70.55%) these specimens from patients with gastrointestinal infection contained B. hominis Parasite alone, the appearance of severe symptoms has been associated with increased parasite numbers in diarrheal specimens (more than five parasites per field with x400), magnification included (Cryptosporidium, Entamoeba. histolytica, Giardia intestinalis, Entamoeba coli, Enterobius vermicularis, Hymenlepis nana) . 43 (29.45%) had other pathogenic parasites, in addition to B. hominis in the same specimen. monthly rate of infection (24.33 %), the highest rate on infection with gastrointestinal parasites in May was (57.42%) and the lowest rate percentage of infection was in January (28.76%); Infection percentage in dependence on Sexes of patients representation in positive sample stool with gastrointestinal parasites, the highest parasite infections were 87 (59.59 %) cases in male, the parasite infection were 59(40.41) cases in female . Infection percentage according of age groups, rate of ages of patients’ representation in positive sample stool with gastrointestinal parasites, the highest rate of ages in patients group were (15-24), Percentage of infection 44 (30.14 % ). And the lowest rate percentage included the age group were (55- 65) Percentage of infection 18 (12.33%). The purpose of the research is to determine the B. hominis frequency among Gastrointestinal and B hominis Symptomatic Diarrhea Infections.

Keywords: Blastocystis hominis, Gastrointestinal infection, Diarrheal

1. Introduction

Blastocystis hominis is one of the most common organisms of the human intestine. Manypeople with B. hominis in their stoolshave no symptoms. Most likely, the organisms transmitted via the oral-faecal route.
There should be good hygiene practices to help prevent Infection.\cite{1} Blastocystis spp. Intestinal protists are commonly reported but the clinical significance of which remains controversial. Infections ranged from asymptomatic carriage to non-specific gastrointestinal symptoms, and in some patient populations were also linked to irritable bowel syndrome and urticaria. In vitro studies have shown that both parasite and parasite lysate have damaging effects on intestinal epithelial cells that cause apoptosis and degradation of tight junction proteins, leading to increased intestinal permeability. \cite{2}

Many people with Blastocystis hominis have no symptoms in their stools. Nonetheless, the most symptoms are diarrhoea, stomach pain and vomiting. Many reported signs include an anal itching, loss of weight, constipation and excess gas. These symptoms can, however, be due to other factors, even if Blastocystis is present in stools. \cite{3} Blastocystis hominis is one of the most common species in the human intestine. People around the globe and higher numbers are identified in developing countries with different prevalence in each sample, 60% in developing countries and 5-20% in developed countries. Host reservoir of this organism is human. A subtype of this organism is concerned with clinical manifestations \cite{4}. Reports recording their relationship with diarrhea and clinical symptoms in patients with immunocompetent and immunocompromised are growing patients. \cite{5, 9}

Diagnosis is dependent on symptoms and the results from a stool sample of the Blastocystis organism. It is also important to exclude other causes of a patient’s symptoms. Diagnosis can be rendered with the use of iron hematoxylin or trichrome stain fecal specimen under a microscope. \cite{6} The Centers for Control and Prevention of Diseases (CDC) deems B. hominis is a pathogenic protozoan. That causes adult diarrhea. Frequently found B.hominis in loose-to-water stools of individuals with gastroenteritis raised the issue of its possible involvement as a cause of the disease.\cite{7} The severity of clinical symptoms increased with a magnification of x400 when the number of parasites was more than five trophozoites per field.\cite{8}

2. The purpose of this study:

Awareness of the prevalence of intestinal pathogenic parasite Blastocystis hominis in patient (auditors) reviewers who reached the Al-Zahraa teaching hospital of Wasit province / Iraq consultation clinic during the period from March to July 31 , 2020.

3. Materials and Methods

In this study, a total of 146 subjects (10-60 years) were enrolled and categorized as patients with gastrointestinal infection who attended the Al-Zahraa teaching hospital with diarrhea complaints and other clinical symptoms indicating gastroenteritis. Diarrhea has been defined as four or more specimens of soft to watery stools per day.\cite{10} Stool samples was taken from these individuals by using plastic containers specified for stool samples collection and directly a 10% formalin saline is added for preservation, the samples were labeled, and stored at cold dark place, after the completion of sample collection, the samples were homogenized by vortex mixer and added to 1.5 ml Eppendorf tubes containing stool diluent, mixed by vortex mixer, and left to stand for 10 min. Each sample was examined using both normal saline and Lugol’s iodine preparation by direct wet mount microscopic examination, and modified Permanent stained smears were performed for intestinal coccidian’s. Technique according to Ziehl-Neelsen \cite{13}. The study took place in the province of Wasit between January 2nd and June 31st 2020.
4. Results

By the examination of (300) stool sample of outpatient (auditors) in Al-Zahraa General hospital. The present study recorded (146) persons infected with gastrointestinal parasites (infection percentage (48.67 %). 98 (67.12%) from patients with gastrointestinal infection had B. hominis, 43 (29.45%) from patients had other pathogenic parasites, in addition to B. hominis in the same specimen, Cryptosporidium recorded the highest causes agents with B. hominis in positive sample stool with gastrointestinal parasites while the lowest was Hymenlepis nana 1(0.77).

Table 1. The types of pathogenic parasite in gastrointestinal infection.

| gastrointestinal infection | N0. | %    |
|---------------------------|-----|------|
| Blastocystis hominis alone| 98  | 67.12|
| Blastocystis hominis with :|     |      |
| Cryptosporidium           | 23  | 15.75|
| Entamoeba histolytica     | 12  | 8.22 |
| Giardia intestinalis      | 5   | 3.42 |
| Entamoeba coli.           | 4   | 2.74 |
| Enterobius vermicularis   | 3   | 2.05 |
| Hymenlepis nana           | 1   | 0.77 |
| total                     | 146 | 100% |

Figure 1. The types of pathogenic parasite in gastrointestinal infection.
And monthly rate of infection (24.33 %) (Table 1, Fig 1), the highest rate on infection with gastrointestinal parasites in May was (57.42%) and the lowest rate percentage of infection was in January (28.76%); as showed in table 2.

**Table 2.** Infection percentage each month.

| Month   | Percentage of infection % | No. Samples Ex. |
|---------|---------------------------|-----------------|
| January | 7.53                      | 11              |
| February| 8.90                      | 13              |
| March   | 11.64                     | 17              |
| April   | 12.33                     | 18              |
| May     | 31.31                     | 46              |
| June    | 28.08                     | 41              |
| Total   | 100%                      | 146             |

![Figure 2. Infection percentage each month.](image)

(Table 3, Fig 3) show Gander of patients representation in positive sample stool with gastrointestinal parasites, the highest parasite infections were (87) cases in mal, (59.59 %); the parasite infection were (59 ) cases in female , (40.41) .

**Table 3.** Infection percentage in dependence on Sexes.

| Gander | Percentage of infection % | No. Samples Ex. |
|--------|---------------------------|-----------------|
| Male   | 59.59                     | 87              |
| Female | 40.41                     | 59              |
| Total  | 100%                      | 146             |
Figure 3. Infection percentage in dependence on Sexes

(Table 4, Fig 4) Show the prevalence of gastrointestinal parasite according to age categories representation in positive sample stool with Blastocystis hominis, recorded the highest infection 44 (30.14 %). cases at age (10-19) years, Percentage of infection While the lowest infection were 18 (12.33%) cases at age (50-60)

Table 4. Infection percentage according of age groups.

| Age / Years | Percentage of infection % | No. Samples Ex. |
|-------------|---------------------------|-----------------|
| 10 - 19     | 30.14                     | 44              |
| 20 - 29     | 21.92                     | 32              |
| 30 - 39     | 19.18                     | 28              |
| 40 - 49     | 16.44                     | 24              |
| 50 - 60     | 12.32                     | 18              |
| Total       | 100%                      | 146             |

Figure 4. Infection percentage according of age groups.
5. **Statistical analysis**

of the data was statistically analyzed using the Cat MakerVR software, with a p value of 0.05 considered to be important. Accuracy was calculated with 95 per cent confidence intervals (CI) as specificity, sensitivity and positive and negative predictive values. [13]

6. **Discussion**

Parasitic diseases in tropical and subtropical regions of the world are a major concern ... Endemic worldwide and identified as the main cause of disease and disease.[5 & 9] As Blastocystis tends to be more prevalent in poor sanitation sites, Good hand hygiene is important , particularly after using the toilet and before handling food. The degrees of each factor and infection prevalence differ across regions [14]. By the examination of (300) stool sample the present study recorded (146) persons infected with gastrointestinal parasites (infection percentage (48.67 %) This result of our study are close to that [12] in Babylon province 48.8%. While. [11] was record 70.4% in Nineveh province.

98 (67.12%) from patients with gastrointestinal infection had B. hominis, 43 (29.45%) from patients had other pathogenic parasites, in addition to B. hominis in the same this study close to the [15] which carry out in Egypt the result show species representation in positive sample stool with gastrointestinal parasites and B. hominis It was the highest proportion of the cause of infection, It was found that about 67.4% of gastrointestinal infection had B. hominis. The current study recorded percentage of infection of parasite different from to study [7], recording 7.2% and 10.2% in tow hospital of Baghdad while [18] was record 16.4%. In Kuwait 2%, Nepal 54% and New Guinea 33% [17]. As with B. Hominis tend to be more prevalent in areas with poor sanitation and high temperatures in the town of Wasit, where the summer weather is dry, contributing to the frequent presence of this parasite..

The Cryptosporidium 23 (15.75) recorded the highest incidence with B. hominis in positive sample stool with gastrointestinal parasites this result. This result is consistent with [16] were the recorded (16.27%). This explains Cryptosporidium had the main cause agent of gastrointestinal infection.

The results in our study illustrated the Infection percentage according to each month, B. hominis was the highest rate infection in May 46 (31.315%) in June 41 (28.08 %) this results close to [16] was recorded the highest rate of infection May was 57.42% in June was 55.88 %. This is due to the same reason mentioned above, where in these months the temperature is sometimes higher than 45°C. Infection percentage in dependence on Sexes the results show the highest infection was among males 87(59.59 %), more than the females 59 (40.41%), this result This result is compatible with [15] in males was 22 patients, Infection percentage was (40 %), while in females was 8 patients, Infection percentage was (14.5 %). No significant difference in statistical analysis was found between man and woman. However, the prevalence of B.hominis was reported by Hegazy et al. In males, was higher than in females (60.5 per cent) compared to 39.5 per cent.[19] The prevalence of gastrointestinal parasite according to age categories representation in positive sample stool with Blastocystis hominis, recorded the highest infection 44 (30.14 %). cases at age (10-19) years, Percentage of infection While the lowest infection were 18 (12.33%) cases at age (50- 60) , this result differs from other studies [16] where it showed the highest rate of infection between 20-30 as well as the age under than 5 years . In fact, most
studies on my parasite *Blastocystis hominis* included the ages of children, so no one has had any results close to the results obtained from this study. Blastocystis hominis is a microscopic organism that is sometimes found in the stools of people with diarrhea, abdominal pain or other gastrointestinal problems who ingested contaminated food or water. It can be found in patients and healthy people who have no digestive symptoms. This explained the younger adults (10-19) years used to eat delivery and fast food, which often contaminated with parasites and bacteria.

7. References

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