Prevalence of Entamoeba Sp. in Children With Diarrhea

Maytham Jamal abas[1], Salah Abid Ali Nadir[2], Haider Noori Fadhil[3], Nihad Khalawe Tektook[4]

1: Professional Diploma in Family Medicine / Al-Sadar Sector / Ministry of Health and Environment
2: Professional Diploma in Family Medicine / Al-Mustansiriya Health Center / Al-Rusafa Sector
3: Professional Diploma in Family Medicine / Fakher Aldeen Aal Jemeel Health Center / Al-Rusafa Sector
4: Middle Technical University / College of Medical and Health Technology, Medical Laboratory Techniques Dep.

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Corresponding Author Name:
Nihad Khalawe Tektook

Corresponding Author Name:
drnihadkhalawe@gmail.com

ABSTRACT
The objective of this study was to evaluate the prevalence of Entamoeba sp. in children with diarrhea who visited the Pediatric Teaching Hospital in Bagdad city and to estimate the level of serum IL-8 in patients. Patients and Methods: From the beginning of May 2022 to the end of November 2023, collected 112 fecal samples from children who had severe diarrhea or diarrhea with blood at the Pediatric Teaching Hospital in Bagdad city. A quantity of stool (especially mucous from it to increase the possibility of the parasite appearing) was taken and placed on a glass slide with a drop of glass physiological solution and a drop of iodine dye, and then examined under the microscope with a wooden stick and a drop of glass physiological solution and a drop of iodine dye, as well as the serum IL-8 levels were measured using the enzyme-linked immunosorbent assay (ELISA). Results: The percentage of samples evaluated by direct swab that was infected with the Entamoeba histolytica parasite The direct swab method was used to evaluate 112 fecal samples from children at the Pediatric Teaching Hospital, and the number of positive infections was 51 (45.53 %), So, a high infection ratio caused by Entamoeba sp. to ≥ 5 years old (43.5%) a parallel low infection ratio (23.5 %) at 10 ≤ years old , E.histolytica and E.dispar were highest (59 and 25 %) respectively in the current investigation, while E.coli infections were lowest (16%), as well as males reporting more E. histolytica cases (63%) than females (37 %).and Patients infected with Entamoeba histolytica had significantly higher IL-8 serum concentrations (35.600± 3.906) than controls (24.442± 2.411) ($p<0.0001$).Conclusion: High infection ratio caused by Entamoeba sp. to ≥ 5 years old, Infection rates with E. histolytica and E. dispar were highest, as well as males reported more E. histolytica cases than females, and Patients infected with Entamoeba histolytica had significantly higher IL-8 serum concentrations than controls.

KEYWORDS
Entamoeba Histolytica Diarrhea, Interleukin (IL-8), Entamoeba Sp

INTRODUCTION

Diarrhea occurs when the usual net absorption of water and electrolytes is switched to secretion. Acute diarrhea is defined as a period of 3 or more loose stools per day that lasts less than 14 days; chronic or persistent diarrhea is defined as a period of more than 14 days [1]. Diarrhea is the leading cause of morbidity and mortality in children under the age of five, especially in low-resource settings [2].

Amoebiasis is a common intestinal protozoan illness caused by Entamoeba histolytica that causes widespread mortality and morbidity around the world due to diarrheal sickness and abscess formation in parenchymal tissues such

as the liver, lung, and brain. E. histolytica is a human protozoon parasite with only one cell. A jelly-like tongue-like protrusion of the cytoplasm propels it forward [3], Amebiasis is spread in situations where poor sanitation allows excrement to contaminate drinking water and food; more than 40% of those who have diarrhea can get infected with amoebic dysentery [Marie 2013,] Eh infection causes symptoms in just 10%–20% of infected people, and symptoms range from moderate diarrhea and abdominal pain to fulminant dysentery, which can be fatal [4].

Entamoeba histolytica is the most prevalent protozoan intestinal parasite in humans, causing ulcerations and spreading dysentery in broad intestinal areas, especially in third-world countries such as the equatorial, Far Eastern, and South American countries [5].

The mucosal layer of the gastrointestinal tract is the major physical barrier against intestinal infections, but the intestinal immune response is the second defense against E. histolytica infection. The fundamental component of the human gut defense mechanism is mucosal immunoglobulins (Ig) [6], Immune responses mediated by cells are also vital in the host's defense against E. histolytica. IECs bind to and recognize the carbohydrate recognition domain of the Gal/GalNAc lectin via toll-like receptor (TLR)-2/4 during the early stages of infection, activating NFB and causing the release of inflammatory cytokines such as IL-1, IL-6, IL-8, IL-12, IFN-, and TNF- [7][8].

PATIENTS AND METHODS

Microsocial examination: From the beginning of May 2022 to the end of November 2023, 112 fecal samples were collected from children attending the Pediatric Teaching Hospital in Bagdad city who had severe diarrhea or diarrhea with blood.

Using a wooden stick and a drop of glass physiological solution and a drop of iodine dye, a quantity of stool (especially mucous from it to increase the possibility of the parasite appearing) was taken and placed on a glass slide, with a drop of glass physiological solution and a drop of iodine dye, and then examined under the microscope. The enzyme-linked immunosorbent assay (ELISA) technology was used to quantify serum IL-8 levels (China).

Statistical Analysis: All samples in the current study were statistically analyzed to detect significant differences for the studied variables using the (chi-square) method, with significant differences identified at the probability level (P≤0.05).

RESULTS

The percentage of samples evaluated by direct swab that was infected with the Entamoeba histolytica parasite The direct swab method was used to evaluate 112 fecal samples from children at the Pediatric Teaching Hospital, and the number of positive infections was (51) (45.53 %), as shown in tab.1.

So, a high infection ratio caused by Entamoeba sp. to ≥ 5 years old (43.5%) and a parallel low infection ratio (23.5 %) at 10 ≤ years old (Table 1) .

TABLE (1): DISTRIBUTION OF INFECTION WITH ENTAMOEBA SP. ACCORDING TO AGE GROUPS

Age groups	Case study		Positive results	
	No.	%	No.	%
≥ 5	52	46	22	43.5
6-10	41	37	17	33
10 ≤	19	17	12	23.5
Total	112	100	51	100

Infection rates with E.histolytica and E.dispar were highest (59 and 25 %) respectively in the current investigation, while E.coli infections were lowest (16%) (Table 2).

TABLE (2): AMEBIC SPECIES IN PATIENTS WITH DIARRHEA

Amebic Species	No.	%
E. Histoltica	30	59
E. Dispar	13	25
E. Coli	8	16
Total	51	100

Table -3 shows that there were significant differences between males and females, with males reporting more E. histolytica cases (63%) than females (37 %).

TABLE (3): DISTRIBUTION OF INFECTION WITH ENTAMOEBA HISTOLYTICA ACCORDING TO GENDER

Gender	No.	%
Male	19	63
Female	11	37
Total	30	100

Patients infected with Entamoeba histolytica had significantly higher IL-8 serum concentrations (35.600± 3.906) than controls (24.442± 2.411) (p<0.0001, Table-3).

TABLE (3): LEVEL OF INTERLEUKIN-8 IN INFECTION WITH ENTAMOEBA HISTOLYTICA

Interleukin-8	Patients' groups	Control group	P-value
	Mean± SD		
IL-8	069.3.600± 35	.4112.442± 24	p<0.0001

DISCUSSION

The percentage of samples evaluated by direct swab that was infected with the Entamoeba histolytica parasite The direct swab method was used to evaluate 112 fecal samples from children at the Pediatric Teaching Hospital, and the number of positive infections was (51) (45.53 %), high infection ratio caused by Entamoeba sp. to ≥ 5 years old (43.5%) and a parallel low infection ratio (23.5 %) at 10 ≤ years old, Because amebiasis is typically transmitted by contaminated food and water, young newborns are unlikely to become infected. Young age, malnutrition, and immunosuppression are all linked to more severe diseases [9].

Similar findings were reported in asymptomatic people in Yemen and Japan [10][11], however, other study findings were similar to the current investigation by reporting greater prevalence rates of E. dispar than E. histolytica. Iran and Turkey both had similar outcomes [12][13], In the present study, males reported more E. histolytica cases (63%) than females (37 %), this is in line with the findings of a local study conducted in Baghdad, which found that males (58.50%) had a greater infection rate than females (41.50 %) In Kirkuk [14], discovered that males (43.8%) had greater infection rates than females (37.2%) [15]. Males (57.60%) had greater infection than females (42.40%) in India [16], while AL-Kubaisy, 2014 found that males had more infection than females [17], this could be because males are more exposed to unsanitary conditions in fields during outdoor activities (contaminated soil, playing with animals, swimming in contaminated water). Females, on the other hand, may choose to remain indoors [17], But the results of Ali, 2015 and Khan, 2017 showed There was no significant difference between male and female patients infected with Entamoeba histolytica (50.65% and 49.35 percent, respectively), When there were no significant differences in the rate of infection with these parasites between male and female patients, however, males had a higher rate of infection than females) [18][19]. It is claimed that both sexes were equally interested in outdoor and indoor activities, which resulted in parasite transmission in both sexes, which contradicts prior studies that found females to be more susceptible to parasite transmission than males [19][20].

Patients infected with Entamoeba histolytica had significantly higher IL-8 serum concentrations than control, Tissue-stable mast cells are known to play a role in the mucosal inflammatory response against E. histolytica, and these secretory products activate mast cells, causing them to generate IL-8, which aids tissue inflammatory responses during the early stages of human amoebiasis [Que, and Reed, 2000), the

current study's findings are totally consistent with those of Ahmed and Al-Nasiri, 2019, who found that the level of IL-8 in children with amoebiasis (37.22 7.06 pg/ml) was significantly higher than the level in healthy children ((29.95 4.30 pg/ml)[21].

The synthesis of IL-8 is induced when a trophozoite comes into contact with a target cell via a galactose in hibitable amoebic adherence protein, coculturing E. histolytica trophozoites with multiple human epithelial cell lines, intestinal smooth muscle cells, human liver cells, and non-transformed human fibroblasts resulted in a 5- to 150-fold increase in IL-8 secretion)[22].

CONCLUSIONS

High infection ratio caused by Entamoeba sp. to ≥ 5 years old, Infection rates with E. histolytica and E. dispar were highest, as well as males reported more E. histolytica cases than females, and Patients infected with Entamoeba histolytica had significantly higher IL-8 serum concentrations than controls.

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