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Prevalence of *Entamoeba histolytica* Among Patients Attending Al-Zubair General Hospital in Basra Province/Iraq

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Abstract

Background: **Besides *malaria* and *schistosomiasis*, *Entamoeba histolytica* the most important sources of illness and death in humans worldwide. The prevalence of *E. histolytica* in Basra province has received little research and it is critical in Basra city to identify and manage the risk factors connected to the parasite.**

Aims: **The objective of this research is to provide insight into the prevalence of amoebiasis among patients who attended Al-Zubair General Hospital during period 2020, 2021 and 2022.**

Procedure: **For the purpose of to detect and diagnose *E. histolytica* infection, (2145) stool samples from patients attending Al-Zubair General Hospital in Basra province/Iraq were randomly collected between January 2020 and December 2022, direct smear microscopy in normal saline was used to evaluate the samples.**

Results: **According to the current study's findings, overall incidences of infection were 47%. The rate of infection varied by age group with the less than one year group seeing the greatest occurrence, the study found that 43% of males and 56% of females were infected, the statistical analysis's findings also showed that significant variations in infection rates were observed with the *E. histolytica* infection throughout the year, December had the greatest infection with rate (67%).**

Conclusions: ***E. histolytica* incidence among peoples in Basra province, Iraq, is higher, and this parasite may have impact on morbidity in these populations *E. histolytica* had a high frequency and unique presentation by disproportionately affecting infants under 1 year olds than other groups.**

Keywords: *Entamoeba histolytica* parasite, Basra, Iraq

Introduction

A protozoan parasite called *Entamoeba histolytica* is present in every country (Kreidl et al., 1999), this ameba was initially reported by D.F. Loch in Petersburg, Russia in 1875 (Roberts et al., 1996), amoebiasis is one of the etiologies of diarrheal sickness and is a parasitic disease brought on by the protozoan *Entamoeba histolytica* (Pritt & Clark, 2008). In poor regions and nation diarrhea contributes significantly to child mortality and morbidity according for a median of 21% of all children fatalities under the age of five years (Kosek et al., 2003), only malaria and schistosomiasis cause more parasite deaths than amoebiasis which ranks third globally (Haque et al., 2006), amoebiasis affects over 50 million people worldwide year, killing close to 100,000 people, infection prevalence ranges from 1% in industrialized nations where untreated drinking water is frequently used to spread *Entamoeba histolytica* cysts. The most common ways to become infected are by direct oral contract with feces and eating or drinking items that have been exposed to *Entamoeba histolytica* cysts from human feces (Bruckner, 1992).

There are two stages to the parasite *Entamoeba histolytica's* life cycle and exists in the environment as resilient infected cysts and harmful trophozoites in the human colon, *Entamoeba histolytica* infection causes the parasite to invade the colon which is followed by tissue destruction and inflammation, human immunological, epithelial and erythrocyte cells are all killed and phagocytosed by parasites during this invasive process, the approach that is most common is known as commensal colonization, in which trophozoites devour enteric bacteria by

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phagocytosing them in the gut lumen (Voigt et al., 1999), (Wilson et al., 2012).

The majority of cases (80%–98%) are amebic colitis which is characterized by bloody diarrhea and stomach discomfort, the remaining (2%–20%) of cases are extra intestinal diseases which most frequently manifest as liver abscesses (Kosek et al., 2003). According to estimates, patient mortality rates for *Entamoeba histolytica* liver abscess range from (0.2%–2%) in adults and up to 26% in kids (Hamad & Ramzy, 2012).

There haven't been many epidemiological studies conducted in Iraq particularly in Basra province there for the objective of this research is to provide insight into the prevalence of amoebiasis among patients who attended Al-Zubair General Hospital during period (2020, 2021, 2022), and research the relationships between sexes, ages and seasons on prevalence infection with *Entamoeba histolytica*.

Materials and methods

Time and location: Designing a study and sampling from January 2020 to December 2022, out of a total (2,145) stool samples were taken from those peoples who had primary enteritis and had signs of diarrhea in Al-Zubair General Hospital in Basra province, tagged with precise identifying information, such as name, age, and the date of collection, on clean plastic bottles.

Collecting Stool: Samples stool features were noted include each of their colors, which range from yellow to brown to semi-brown to greenish, mucus, serous, greasy and splattered textures. Sodium chloride solution with a 0.9 percent concentration was employed to create a direct saline method analyze the samples under a light microscope using the tip of a wood applicator a tiny sample of recently passed solution and a glass slide on the direct smear method was used to thoroughly inspect this slide under a microscope in order to look for trophozoites or cysts (Singh et al., 2009).

Analysis of data: The mean and standard deviation for quantitative variables, as well as the ratio and rate for qualitative variables were used in the SPSS program (version 23) analysis of data, the chi-square test was used to compare quantitative data, analyzed relationships between putative risk factors and the prevalence of *Entamoeba histolytica* infection and evaluate qualitative variables, it was deemed statistically significant when the p-value was less than 0.05.

Results

In this study 2145 patients who attended Al-Zubair General Hospital in Basra province/Iraq, underwent stool examination (from January 2020 to December 2022) the percentage of infections with *Entamoeba histolytica* throughout this time are shown in Fig. 1 out of a total (2,145) samples were analyzes (47%) of those samples had infection with *Entamoeba histolytica*.

The relationship between *E. histolytica* infection by gender over the years 2020, 2021 and 2022 is shown in Fig. 2, the findings indicate the frequency of amoebiasis in females was found to be (56%) which was higher than the prevalence in males (43%), P-value less 0.05.

Fig. 3 shown the findings of *E. histolytica* across different age groups with the children under one year old group having the highest rate of infection (65%) followed by the age range (between one and ten years) with an infection rate of (60%), while the age group's lowest infection rate (24%) ever observed (41–50) years old.

Fig. 4 shown the distribution of *Entamoeba histolytica* by months of the year, the higher percentage of feces that tested positive for *Entamoeba histolytica* infection was seen in December (67%), which was followed by November (64%) while had lowest percentage rate February (23%).

Discussion

Amoebiasis is brought on by the parasite protozoan *E. histolytica*, humans are prone to developing liver abscesses and amebic colitis from the enteric tissue-invasive protozoan parasite *E. histolytica*, it is disseminated by the oral-fecal pathway and, to a much lesser extent, during sexual contact (Cheng et al., 2020, Katherine et al., 2011). Stool examinations were performed on (2,145) patients who attended the Al-Zubair General Hospital in Basra during period (2020, 2021, 2022), *Entamoeba histolytica* was detected with overall infection rate (47%).

The outcomes of the present investigation showed the frequency of amoebiasis infection in females was found to be (56%), which was higher than that in males (43%) though this was not statistically significant correlation between gender and the disease's prevalence, The current study is comparable

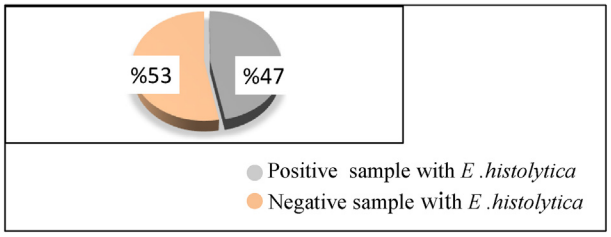

Fig. 1. Prevalence of E. histolytica in the patients whom attended Al-Zubair General Hospital during period 2020 to 2022.

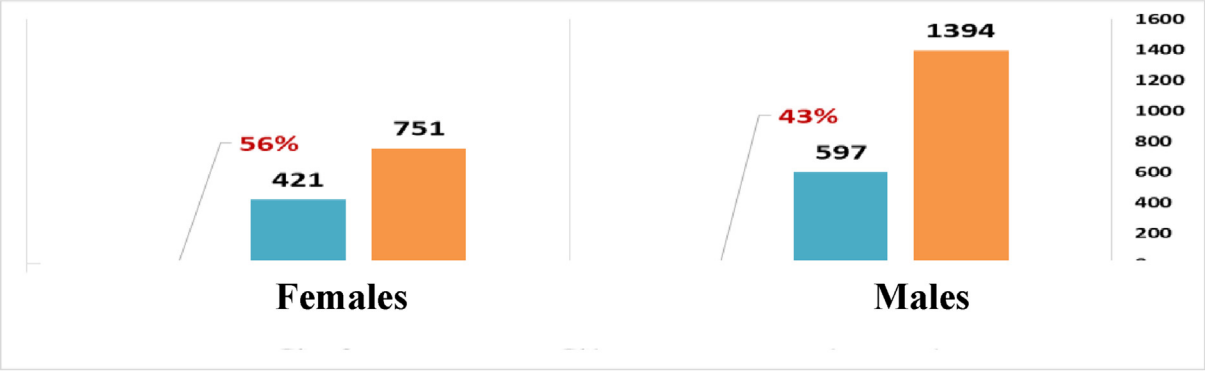

Fig. 2. Prevalence of E. histolytica according to the sexes of the patients in who attended Al-Zubair General Hospital.

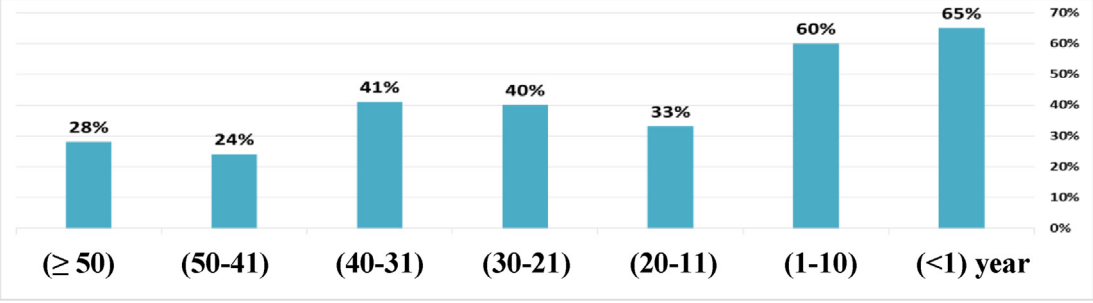

Fig. 3. Prevalence of E. histolytica according to the age groups in the patients.

to the research done in Iraq's Kirkuk Teaching Hospital (Obaid, 2016), according to the findings of the following study, female patients were 81.8% more likely to get *E. histolytica* infection than male patients (18.1%), a number of factors including living in substandard surroundings, a reduced quality of life, different jobs, educational levels, family sizes, and socioeconomic position, might contribute to this. Another study carried out in Erbil, Iraq, lends confirmation to the current study's conclusion (Mahmood & Bakr, 2020). The current findings were found to be not identical to those of (Obaid, 2014) who discovered no discernible variations in the rate of this parasite infection between male and female patients, he suggested that both sexes were equally active in outdoor and indoor activities that resulted in the transmission of the parasite in both sexes, the findings of this study contrast with those of (Obadiah, 2012), whose findings indicated that men and females, respectively, prevalence rates of amoebiasis of 48.8% and 34.4%, in addition, other research indicate that men are more often than women to have amoebiasis (27.7%, 24.3%) respectively (Reuben et al., 2013), variations in environmental and physiological conditions, which are initially hormonal, can be blamed for the greater occurrence of *E. histolytica* in males (Zuk & McKean, 1996).

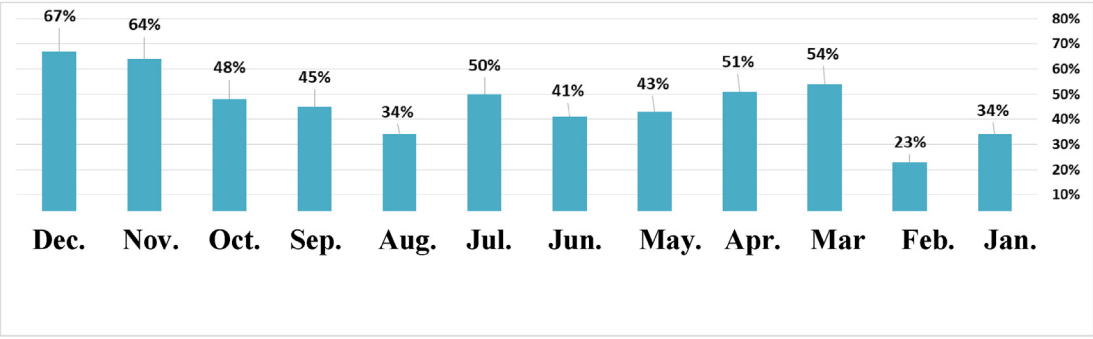

Fig. 4. Prevalence of E. histolytica during months of the year.

The age groups of children under one year either had the greatest reported prevalence rates of amoebiasis infection and (41–50) years (65%) and (24%) respectively, and the differences were statistically significant, children in this age range have higher infection rates than older children since they are less healthy and resistant, furthermore, young children's vital defense systems are not completely formed, which makes it harder for them to resist sickness and makes them more susceptible

To parasites than older people, also there are several factors that contribute to the incidence of amoebiasis including inadequate water supply, a lack of social support, inappropriate toilet training, bad hygiene, environmental factors, and big populations (Abioye et al., 2019; Callixte et al., 2019; Rahi & Majeed, 2019), the results of the current disagree with those in Basra which found that highly prevalent among individuals who are over forty five year olds claimed that the rise in infections in older people was caused by either a decline in people's standards of the use of human excrement as fertilizer for the land or poor hygiene and sanitation, which increases the risk of infection among horticulturists, the majority of whom are in this age range (Al-Shaheen et al., 2007).

December had the highest rate of *E. histolytica* infection (67%), whereas February had the lowest prevalence (23%), these findings corroborate those of (Nassar et al., 2019) he that demonstrated that various seasons had distinct prevalence rates of *E. histolytica* for instance, in the month of December (58%) while both of March and February had lowest percentage rate, this finding disagree with those of (Ibrahim, 2012) who noted an increase in the prevalence of amoebiasis from May to September, these finding could be explained by an increase in the occurrence and procreation of various insects that contribute to this parasite spreading during hot season of the year or by an increase in the host's sensitivity to various intestinal microbes within the aforementioned time period (Shah, 2002).

Conclusions

E. histolytica incidence among peoples in Basra province, Iraq, is higher, and this parasite may have impact on morbidity in these populations. Additionally, additional an inquiry is required to clarify the epidemiological risk factors of *E. histolytica* in an effort to advance environmental sanitation practices and health education programs and protect children in Basra city from the disease.

Conflict of interest

No conflict of interest.

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