

The Relationship between *Helicobacter pylori* Infection and Some Intestinal Parasites for Patients Attending to Shirqat General Hospital/Salah Al-Din Governorate

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ABSTRACT

The current study was conducted to detect the infection rate of the *Entamoeba histolytica* and *Giardia lamblia* parasite and to determine the relationship between them and *Helicobacter pylori* bacteria for patients attending Shirqat General Hospital in Salah al-Din Governorate during the period from October 2020 to March 2021. The number of examined samples reached 409, as they were examined by direct smear and Concentration methods using an optical microscope. The results of the study showed that the total infection rate was 46 (11.24%) positive samples and 363 negative samples with a rate of (88.7%), the *Entamoeba histolytica* was dominant with rate 67.38%, followed by *Giardia lamblia* with rate 32.61%, and the infection rates for males were higher than for females. Where the infection rate of males reached 14.29% (34 out of 238) and 7.02% of females (12 out of 171), respectively. The infection rates varied between age groups, as the highest rate of infection was in the age group ≥ 10 -1 years, which amounted to 32.6%, and the lowest rate of infection was in the age group 60-51 years, with a rate of 2.17%. The highest infection rate was in October, which amounted to 14.89%, while the lowest infection rate was in December, with a rate of 7.35%. All positive samples were examined for microscopic examination by rapid antigen test to detect *H.pylori* bacteria involved in infection with *Entamoeba histolytica* or *Giardia lamblia*, and the results showed that 13 (28.26) samples were positive and 33 (71.73%) were negative samples, and the Co-infection infection rate was between the *Entamoeba histolytica* and *H.pylori* 9 (29.03%) were higher than that of *Giardia lamblia* and *H.pylori* 4 (26.66%). The results of the statistical analysis showed that there were significant differences between the sex of patients infected with these parasites and the rates of infection during the months of the study and the age groups of infected patients.

Keywords- *H.pylori*, stool samples, *Giardia lamblia*, ether-formalin concentration, *Entamoeba histolytica*

some of which are caused by infection or not, but the causes are sometimes unknown(2). It is caused by microorganisms such as parasites, bacteria, viruses and other unknown causes(3). One of the parasites that causes diarrhea is a *E. histolytica* of the intestinal protozoa anaerobic unicellular eukaryote common in the world, the Trophozoite lives in the large intestine where it multiplies and differentiates into cysts that are released into the environment(4). Intestinal amoebiasis caused by *E.histolytica* is the third largest parasitic disease responsible for death in the world after schistosomiasis and malaria(5). It affects approximately 40-50 million people annually around the world, causing 10,000-40000 deaths annually, with this, approximately 10% of cases are asymptomatic, while 90% of cases are asymptomatic(6).

Giardia lamblia is an intestinal protozoa parasite of unicellular eukaryotic anaerobic. This parasite goes through two phases (the cyst and the trophozoite), the cyst is responsible for causing the infection usually and the ability to resist unfavorable conditions and adapt to the external environment to survive, while the trophozoite is responsible for the virulence and clinical symptoms in the host(7,8). Clinical signs of infection with *Giardia lamblia* vary from symptomatic to non-existent, and this depends on the immune response of the host as well as the strain of the parasite. *Giardia lamblia* usually causes steatorrhea, nausea and vomiting, weight loss, loss of appetite, which is one of the most obvious clinical signs of infection with this parasite(9,10). Giardiasis is a common disease all over the world(11). Infection with this parasite spreads in different regions of the world, especially in tropical and subtropical regions, as well as crowded industrial places and environments that lack sanitary conditions(12).

Helicobacter pylori, Gram-negative bacilli, is one of the most common gastrointestinal diseases(13). This bacterium infects at least 50% of the world's population. The infection is more common in early childhood and leads to chronic gastritis in children and adults(14). The faecal-oral or oral route is the main candidate route for transmission, Although much is unknown in this regard(13,15). Studies have shown that *H.pylori* can cause diarrhea(14). The urease produced by *Helicobacter* bacteria helps intestinal protozoa and

I. INTRODUCTION

Diarrhea is a common health problem, and diarrhea lasts for two or three days and is in the form of watery and loose stools more frequently daily than normal(1). There are many possible causes of diarrhea,

bacteria to cross the acidic environment of the stomach easily, In addition to *H.pylori* infection, intestinal protozoa have been reported to stimulate symptoms of gastrointestinal disorders(16). In different parts of the world a possible association between intestinal protozoa and *H.pylori* infection has been documented with a prevalence of 75% of *H.pylori* infection among patients with gastrointestinal parasites(17,18,19). Due to the prevalence of intestinal protozoa causing diarrhea, and the lack of studies related to the association of *H.pylori* bacteria with intestinal protozoa in patients with diarrhea and the effect of bacterial co-infection with intestinal protozoa, this study was designed in order to know the extent of co-infection of *H.pylori* and *H.pylori* in patients attending Shirqat General Hospital.

II. MATERIALS AND METHODS

Patient selection

From October 2020 to March 2021, the study included the examination of 409 patients of both sexes, aged 5-60, who complained of digestive disorders, abdominal pain, fever, vomiting and diarrhea, and who were referred to consulting clinics at Shirqat General Hospital in Salah al-Din Governorate, in addition to patients who visited private sector laboratories.

Stool sample collection

Fresh stool samples were collected from patients using sterile, labeled, 30ml, wide-opening plastic containers with a tight seal to prevent the sample from drying out and to maintain its moisture. Stool samples were divided into two parts, one part used for direct microscopic examination for the purpose of detecting the phases of the intestinal protozoa, and the other part used for the detection of *H.pylori* bacteria.

Examination of stool samples

Stool samples were examined microscopically by direct wet smear using 0.9% normal saline solution, direct wet smear using local iodine 1% dye or by ether-formalin concentration method with a magnification of 40 X or 100 X for the purpose of detecting the stages of the intestinal protozoa, and Cassete is used in the rapid

antigen test According to the manufacturer's instructions for detection of *H.pylori* bacteria.

III. STATISTICAL ANALYSIS

The results of this study were analyzed using the t-test, and there were significant differences under the probability level, $P \leq 0.05$, $P \leq 0.01$.

IV. RESULTS AND DISCUSSION

The current study included the examination of 409 stool samples from patients who complain of digestive disorders, as they were examined by direct wet smear method and ether-formalin concentration method using a light microscope. The results showed that there were 46 (11.24%) positive samples in the intestinal primary and 363 negative samples that may be another cause of diarrhea, and the percentage was 88.7%. *E.histolytica* parasite obtained a percentage of (7.57%) This result is almost in agreement with what he came up with(20) When studied on primary and secondary school students in the city of Baiji, the infection rate is (7.52%) And what he recorded(21) The infection rate reached (7.1%) in the city of Dohuk by examining 1261 faecal samples. And what was recorded (22) in the city of Tikrit, where it recorded a rate of infection (9.7%), And what was recorded(23) in Saudi Arabia with a percentage of (9.2%). As for *G.lambliia* parasite, it obtained the highest infection rate of (3.66%), This percentage is close to what was recorded (24) in Salah al-Din 4.6%, and (25) in the city of Mosul with 4%, and (26) in Ethiopia with 3.3%.This discrepancy in the rate of infection in the intestinal protozoa of the current study from the previous studies may result from the difference in the areas from which samples were collected and the years of study and the difference in the total number of samples examined and the method of conducting the examination to detect intestinal parasites as if the direct method was used only and other concentration methods were not used(27).

Table 1: The total percentage of parasitic infections for the study group

Total number of samples	The Number of positive samples (%)	The number of negative samples (%)	Statistical function p value
409	46 (%11.24)	363 (88.7%)	$\leq 0.01^{**}$
Parasite <i>E.histolytica</i>	31 (%7.57)	378 (%92.42)	0.018*
Parasite <i>G.lambliia</i>	15 (%3.66)	394 (%96.33)	0.02*

$P \geq 0.05$: Non-significant; *: Significant at $p \leq 0.05$; **: Highly significant at $p \leq 0.01$

The incidence of intestinal protozoa infections in males was higher than in females, as it reached (14.29%) in males, this result is consistent with the result of (28), which is (18.75%), but it differs with the result

of (29), which is (39.67%). As for the percentage of infection with intestinal protozoa infections in females (7.02%), it corresponds to what was stated (30), as it reached (6.3%) as well as (28), which reached (9.75%),

However, it lags behind (29) with a percentage of (31.45%). The results of the statistical analysis showed that there is a significant difference in the incidence of

infection between males and females at the probability level $p \leq 0.01$.

Table 2: Infection distribution of intestinal parasites by sex

Sex	Positive Samples Number (%)	Negative Samples Number (%)	Statistical function p value	Positive Samples Number (%)		Statistical function p value
				<i>G.lamblia</i>	<i>E.histolytica</i>	
Male	34 (14.29)	204 (85.71)	$\leq 0.01^{**}$	12 (5.04)	22 (9.24)	0.08
female	12 (7.02)	159 (92.98)	$\leq 0.01^{**}$	3 (1.75)	9 (5.26)	0.08
the total	46 (%100)	363 (%100)	-	15 (%3.66)	31 (%7.57)	-
p value	$\leq 0.01^{**}$	0.018*		0.02*	0.018*	

$P \geq 0.05$: Non-significant; *: Significant at $p \leq 0.05$; **: Highly significant at $p \leq 0.01$

This difference in infection rates between males and females in the current study and previous studies depends on the habits of society. For example, most societies are male societies, which makes males the priority in direct contact with the external environment, and animals that are present in homes such as insects, rodents and livestock also have a role in transmitting parasitic infections by being It acts as an intermediate or storage host(31), In addition to the socio-economic situation and crowding, which mainly affect the incidence of intestinal parasites.

The results of this study show the distribution of patients with intestinal protozoa infections by age group, It was found that the highest rate of infection (32.6%) was in the age group between (10-1) years, where the number of infected people reached 15, While the lowest infection rate (2.17%) was in the age group (60-51 years), with one infected person. Statistical analysis showed that there were significant differences in

the incidence rates between age at the probability level $p \leq 0.01$. This result is consistent with the result (32) in Kirkuk, in his study on *E. Histolytica* and *G. lamblia* which recorded that the incidence of *E.histolytica* was significantly higher in less than 10 years (60%), and the result of (33) in Erbil governorate reported (38%) in the age group (1-12 years), and the result of (34) in Côte d'Ivoire. The reason for the high incidence of infection in the age groups (10-1) years is due to several factors, including: the fact that children are less resistant to infection compared to adults due to the incompleteness and maturity of their system, and that children are usually in a state of contact with the environment as well as mixing with each other, especially in schools and kindergartens Children As for the low incidence of infection in the age groups (60-51) years, it is due to the increase in health awareness and the development of their immune system.

Table 3: Distribution of intestinal protozoa infection by age group

Age group (year)	The number of cases	Percentage %
$\leq 1-10$	15	32.6%
11-20	13	28.26%
21-30	8	17.39%
31-40	5	10.86%
41-50	4	8.69%
51-60	1	2.17%
the total	46	100%
Statistical function p value	$\leq 0.01^{**}$	

$P \geq 0.05$: Non-significant; *: Significant at $p \leq 0.05$; **: Highly significant at $p \leq 0.01$

The current study included, by examining the stool of patients infected with intestinal parasites, by means of a rapid antigen test to detect *H.pylori* bacteria, a total of 31 (67.38%) were infected with *E. histolytica*, there were 9 (29.03%) patients who were found to be

infected with *H.pylori* bacteria after the appearance of their stool positive for this bacteria, and then out of the total of 15 (32.61%) infected with the parasite *Giardia lamblia*, it was found that there are 4 (28.26%) infected with *H.pylori*. This study agrees with the result of (35) in

Baghdad, which recorded out of 118 stool samples only 35 (29.7%) were infected with *H.pylori*. It is also compatible (36) In the United States and Mexico, from the examination of 386 stool samples, *H.pylori* was

found with a percentage of 38.2%. The differences and concordance with previous studies may be due to the characteristics of the study population or due to the different stage of the disease(37).

Table 4: shows the percentage of *H.pylori* infection among parasitic infections

Parasite type	The number of positive samples	The rate of co-infection with <i>H.pylori</i>	Statistical function p value
<i>E.histolytica</i>	31 (67.38%)	9 (29.03%)	≤ 0.01**
<i>G.lambliia</i>	15 (32.61%)	4 (26.66%)	0.011*
The total	46	13 (28.26%)	-
p value	0.018*	0.165	

P ≥ 0.05: Non-significant; *: Significant at p ≤ 0.05; **: Highly significant at p ≤ 0.01

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