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Association Between *Helicobacter Pylori* Infection and Intestinal Parasite Infection in River Nile State, Sudan

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Abstract

In developing countries, *Helicobacter pylori* infection is common, as are intestinal parasites. Socioeconomic events and low personal hygiene lead to the spread of these conditions. This study was conducted during the period from April to July 2018. This study aimed to determine the association between *Helicobacter pylori* and intestinal parasite infection among all individual that was infected with an intestinal parasite. A total of 50 subjects (n=50) were included in the study in all different Ages. And for both males and females or gender from the study participant, stool samples in the clean dry container were obtained. The stool sample was tested for *Helicobacter pylori* antigen by using immune chromatography test antigen of stool. Out of the 50 patients tested 10 were *Helicobacter pylori* and intestinal parasite positive, and 40 patients with an intestinal parasite and negative *Helicobacter pylori*. Also, we concluded that there was a very low percentage between *Helicobacter pylori* and intestinal parasites and was no significance (P=0.91).

Keywords: Intestinal parasites *H. pylori*; Co-infection; Sudan

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Introduction

Among the most common diseases in the world are intestinal parasite infections; an estimated 3.5 billion people are affected, and 450 million people are infected [1]. These infections are considered a serious public health problem as they cause anemia with iron deficiency, retardation of growth in children, and other physical and mental health problems [2]. One example is a pathogenic intestinal protozoon that infects the small and/or large intestine [3]. Or an intestinal worm, such as *Ascaris lumbricoides*, *Trichuris trichiura*, *Enterobius vermicularis*, and hookworms, which affect people in tropical countries [4]. It is estimated that *H. pylori* infects more than 50% of the world population [5]. With highest burden among developing countries like those in Africa [6]. *G. lamblia* has also a worldwide distribution affecting approximately 200 million people globally with 500,000 new cases per year [7].

Besides similar mode of transmission and strong co-relation to socioeconomic levels [8], urease production by *H. pylori* helps intestinal parasites and bacteria to easily cross the stomach's acid environment [9]. While infections with this strain of bacteria typically don't cause symptoms, they can lead to diseases in some people, including peptic ulcers, and an inflammatory condition inside your stomach known as gastritis. *Helicobacter pylori* are adapted to live in the harsh, acidic environment of the stomach. These bacteria can change the environment around them and reduce their acidity so they can survive [10]. The spiral shape of *Helicobacter pylori* allows them to penetrate your stomach lining, where they're protected by mucus and your body's immune cells are not able to reach them. The bacteria can interfere with your immune response and ensure that they're not destroyed. This can lead

to stomach problems. *Helicobacter pylori* are mainly transmitted by the oral-fecal route [11]. Gastric adenocarcinoma is heterogeneous cancer. First, it is necessary to distinguish the tumors arising from the gastric proximal stomach (cardia), as most of them are not linked to *Helicobacter pylori* infection from those found in the distal part of the stomach. Among tumors from the distal stomach, based on histology, it is usual to differentiate two types of cancer lesions: the intestinal type and the diffuse type according to the Lauren classification. Intestinal-type cancer is the most frequent. It corresponds to a slow evolution of the gastric mucosa which becomes atrophic; then intestinal metaplasia appears, followed by dysplasia and ultimately *in situ* gastric carcinoma and metastatic carcinoma. This is the so-called Correa cascade, which was described before *Helicobacter pylori* were discovered and appear late in life [12].

Materials and Methods

- Study design: Cross-sectional study design.
- Study area: The study was conducted in river Nile state, Sudan, from April to July 2018.
- Study population: All individual males and females were infected by the intestinal parasite during the study period.
- Sampling technique: Stool sample in clean dry container tested by stool ICT antigen.
- Sampling collection: The sample was collected under the aseptic condition in a clean dry container and examined freshly within minutes.
- Data collection: Personal and clinical data were collected by direct interviewing questionnaires from each subject and stool sample.
- Data analysis: Data were analyzed through SPSS version 23.
- Ethical consideration: Permission to carry out the study was obtained from the College of Health, Elshaikh Abdallah Elbadri University. All specimen donors were examined and informed for the study before the collection of the sample and verbal consent was taken from them.

Results

This is a descriptive cross-sectional study conducted in river Nile state during the period from April to July 2018, to Association between *Helicobacter pylori* and the intestinal parasite was collected data, out of the 50 patients tested 10 were *Helicobacter pylori* and intestinal parasite positive, 40 patients with an intestinal parasite and negative *Helicobacter pylori*; (Tables 1-5).

Table 1: Distribution of study group according to gender.

Gender	Frequency	Percent%
Male	33	66
Female	17	34
Total	50	100

Table 2: Distribution of study group according to age.

Age	Frequency	Percent%
Less than 10	1	2.00%
10 20	12	24.00%
20 30	24	48.00%
30 40	7	14.00%
More than 40	6	12.00%
Total	50	100.00%

Table 3: Distribution of *Helicobacter pylori* in study group.

<i>Helicobacter pylori</i>	Frequency	Percent%
Positive	10	20.00%
Negative	40	80.00%
Total	50	100.00%

Table 4: Frequency of Parasitic infection among study group.

Parasitic Infection	Frequency	Percent%
<i>E. histolytica</i>	29	58.00%
<i>G. lamblia</i>	18	36.00%
<i>H. nana</i>	3	6.00%
Total	50	100%

Table 5: Relationship between *Helicobacter pylori* and Parasites.

Parasites Infection		<i>Helicobacter pylori</i>		Total
		Positive	Negative	
<i>E. histolytica</i>	Count	5	24	29
	Total	10%	48%	58%
<i>G. lamblia</i>	Count	5	13	18
	Total	10%	26%	36%
<i>H. nana</i>	Count	0	3	3
	Total	0%	6.00%	6.00%
Total	Count	10	40	50
	Total	20%	80%	100%

Discussion

This study was conducted on 50 patients infected with intestinal parasites to detect *Helicobacter pylori* infection; the positive *Helicobacter pylori* infection was detected by using Immuno-a chromatography test antigen. The study shows that distribution of gender, male 33 (66%) and female 17 (34%) the age between less than 10 to more than 40 years, and parasite infection distribution found in the study *Entamoeba histolytica* 58%, *Giardia lamblia* 36% and *Hymenolepis nana* 6%. 10 patients with an intestinal parasite and *Helicobacter pylori* and 40 patient negative *Helicobacter pylori* and positive intestinal parasite in our study we found that *E. histolytica* and *Giardia Lamblia* are the most common intestinal parasites found with *Helicobacter pylori* among another intestinal parasite. in a previous study done by Kazeman H et al. [13] relationship between *Helicobacter pylori* infection in Ilam iran

2014. A total of 130 patients with 65 positives of *Helicobacter pylori* and intestinal parasite infection based on ELIASA the parasite was found *Giardia lamblia* 30.7% and *Entamoeba histolytica* 10% [13]. In another study done by Seid A et al. [14] co-infection of intestinal parasites and *Helicobacter pylori* in a hospital in northeast Ethiopia in 2015, Resulted: in a total of 363 patient consecutive adults based on serological ICT test *Helicobacter pylori* and intestinal parasite detection in 225 (70.5%) *Giardia lamblia* 22.3% of isolated parasite ($p=0.05$) [14]. also, a study done by Torres J et al. [15] association of intestinal parasites and *Helicobacter pylori* in children and adults from a Mexican community in 2003 study population included 120 children and 88 adult from a low socioeconomic level village determined by serum ELISA parasite infection by microscope examination [15]. Result; by contrast, adults with intestinal parasite infection had significantly lower *Helicobacter pylori* prevalence than adults without the parasite 62.6%) ($p=0.006$). also, the male and female percentage was analyzed and found that males are more infected than females, with a most patients infected in age (20-30) years the relationship between *Helicobacter pylori* and intestinal parasite is very weak *Helicobacter pylori* ($P=0.91$).

Conclusion

The study concluded that *Helicobacter pylori* infection was detected in meager value with 10 positive samples from 50 samples among whom that infected with intestinal parasite revealing that there was no significant association between *Helicobacter pylori* and intestinal parasite with [$P=0.91$].

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