

## Prevalence of Helicobacter Pylori in Patients with Hepatic Hydatid Cyst

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### ABSTRACT:

#### BACKGROUND:

Echinococcosis (hydatid disease or hydatidosis) is endemic in some parts of the world. It is a zoonotic disease and human is an accidental intermediate host. Helicobacter pylori (H. pylori) is a spiral-shaped bacterium that is found in the gastric mucous layer or adherent to the epithelial lining of the stomach. H. pylori causes more than 90% of duodenal ulcers and up to 80% of gastric ulcers.

#### OBJECTIVE:

To detect the prevalence of H. pylori in patients with liver hydatid disease.

#### PATIENT AND METHOD:

The study was carried out from the 1<sup>st</sup> of July / 2009 to the 1<sup>st</sup> of October / 2010 & included two groups: Group A, which included sixty patients who presented to the surgical units of Baghdad teaching hospital & Al – Fairros general hospital in Al – kut governorate with liver hydatid cyst for elective surgery, they were investigated for H pylori (by ELISA test for anti H-pylori IgG Ab). Group B, which included 72 of the patients first degree relatives who live in the same house also investigated for H pylori.

#### RESULTS :

The study found that in group A : patients with hydatid cyst and positive H pylori represents 48 cases ( 80% ), while in group B: first degree relatives with positive H pylori 43 ( 59.7%).

#### CONCLUSION:

The prevalence of H-pylori is increase in the patients with hepatic Hydatid cysts, as There is a significant positive relationship between the presence of H pylori and liver Hydatid disease.

**KEY WORDS:** ecinococcosis ,hydatid cyst, Helicobacter pylori.

### INTRODUCTION:

Echinococcosis (hydatid disease or hydatidosis) is endemic in some parts of the world. It is a zoonosis transmitted from domestic and wild members of the canine family via parasite eggs to a variety of wild and domestic animals<sup>(1)</sup>.

The endemic areas are the Mediterranean countries, the Middle East, the southern part of South America, Iceland, Australia, New Zealand, and southern parts of Africa. The incidence of cystic echinococcosis in endemic areas ranges from 1-220 per 100,000 inhabitants. Three major Echinococcus species are responsible for distinct clinical presentations, E. granulosus (cystic hydatid disease) and the more malignant E. multilocularis (alveolar hydatid disease) and E. vogeli. E. granulosus is the most common of the three, E. multilocularis is rare but is the most

virulent, and E. vogeli is the most rare<sup>(2)</sup>.

Humans may become intermediate hosts through contact with a definitive host (usually a domestic dog) or ingestion of contaminated water or vegetables<sup>(3)</sup>.

Once the parasite passes through the intestinal wall to reach the portal venous system or lymphatic system, the liver acts as the first line of defense and is therefore the most frequently involved organ<sup>(4)</sup>.

In the human liver, cysts grow to 1 cm during the first 6 months and 2–3 cm annually thereafter, depending on host tissue resistance<sup>(3)</sup>. In humans, hydatid disease involves the liver in approximately 75% of cases, the lung in 15%, and other anatomic locations in 10%. A liver cyst may remain silent for 10-20 years or more until it becomes large enough to be palpable, to be visible as an abdominal swelling, to produce pressure effects or to produce symptoms due to leakage or rupture<sup>(4)</sup>.

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The confirmatory diagnosis of most case of cystic Echinococcosis can be done by various imaging techniques like x-ray examination, ultrasonography, computed tomography (CT) scanning and magnetic resonance imaging (MRI). Besides, highly specific and sensitive serological tests like antigen B-immunoblot antigen B-ELISA and EgCF-ELISA has been developed that use cyst fluid for diagnosis of Echinococcosis<sup>(5)</sup>.

Currently the definitive treatment is surgical removal of cysts. Newly available chemotherapy (albendazole or mebendazole) may alter this position<sup>(4)</sup>.

Helicobacter pylori (*H. pylori*) is a spiral-shaped bacterium that is found in the gastric mucous layer or adherent to the epithelial lining of the stomach. *H. pylori* causes more than 90% of duodenal ulcers and up to 80% of gastric ulcers. We now know that most ulcers are caused by *H. pylori* and appropriate antibiotic regimens (eradication therapy) can successfully eradicate the infection in most patients, with complete resolution of mucosal inflammation and a minimal chance for recurrence of ulcers<sup>(6)</sup>.

*H. pylori* burrows deep into the mucosal lining until it finds and attaches to the antigens on the surface of epithelial cells. The bacteria produces large amount of urease, an enzyme that can break down urea in the stomach. By breaking down the urea, it produces ammonia which forms a 'cloud' around the bacterium. This raises the pH (acid-base level) making the immediate environment less acidic thereby protecting the bacterium from the corrosive stomach acid<sup>(7)</sup>.

*H. pylori* can also cause localized inflammation within the stomach wall, release proteins that causes cell death, inhibit immune activity and affect the secretion of hormones from the stomach wall (gastrin and somastatin). *H. pylori* acts on G cells to increase the secretion of gastrin (hypergastrinemia) which will then increase the production and secretion of gastric acid<sup>(7)</sup>.

*H. pylori* may be the most common bacteria causing human infection, in endemic areas it is not unusual to have infection rates of 80-90%<sup>(8)</sup>.

Studies have estimated the prevalence of *H. Pylori* amongst the Iraqi population to be around 74.87% to 81.5%<sup>(9,10)</sup>.

Diagnosis of *H. pylori* can be achieved through the following tests:

1. *H. pylori* fecal antigen test<sup>(11)</sup>.
2. Carbon 13 urea breath test<sup>(12)</sup>.
3. *H. pylori* serology<sup>(11)</sup>.
4. Antibioqram<sup>(11)</sup>.

5. Esophagogastroduodenoscopy and biopsy from the gastric antrum<sup>(12)</sup>. It is (98%) sensitive & (99%) specific<sup>(12)</sup>.

### PATIENTS AND METHOD:

This study was carried out in Baghdad teaching hospital & Al – Fairouz general hospital in Al – Kut province from the 1<sup>st</sup> of July 2009 to the 1<sup>st</sup> of October 2010 and it included 132 persons, whom were divided into two groups:

Group A: which included 60 patients with liver hydatid cyst, diagnosed by ultrasonography and CT scan and admitted for elective surgery, their age ranged from 8 – 60 years , the males (15) & the females (45), were investigated by ELISA test ( IgG AB ) for the presence of *H. pylori*, and in those patients pulmonary hydatid cysts were excluded by chest-x-ray.

Group B: which included 72 of the patients' first degree relatives who live in the same house, males (42) and females (30). Hydatid disease in this group was excluded by CXR and abdominal U/S. They were investigated by ELISA test (IgG) for the presence of *H. pylori*, they have no previous history of any complaint of gastrointestinal tract diseases and not receiving any medication related to eradication of *H. pylori* infection, they were regarded as control group.

The agreements of both groups ( patients and controlled ) were taken for these investigations and registered .

### RESULTS:

In group A (60 patients with hydatid cyst), 48 ( 80% ) were positive for *H. pylori* and 12(20%) were negative for *H. pylori*, while in group B ( 72 first degree relatives), 43( 59.7% ) were positive for *H. pylori*, 29 (40.3% ) were negative for *H. pylori*. The *H. pylori* status distribution of the two groups was statistically significant (P=0.012) as in TABLE 1.

There was a statistically significant relationship between increased age and *H. pylori* infection in both groups, the percentage of patients with positive *H. pylori* who were forty years or above was the highest in group A ,11( 100% ) (P= 0.029), and in group B ,30( 81.1% ),(P=0.0001) as in TABLE 2.

For sex distribution the study shows that there was no significant difference between males and females in both groups regarding the infection with *H. pylori* , it was for the group A males, 11 (73.3% ); females, 37 ( 82.2% ), while for group B males, 26 ( 61.9% ) and females, 17(56.7% ) as in TABLE 3.

There was no significant difference between rural and urban areas regarding infection with *H. pylori*

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in both groups , it was for group A; urban 21(87.5%), rural 27 ( 75% ), while for group B; urban, 15 ( 53.6%) and rural,28( 63.6% ) as in TABLE 4.

In Table 5 the results were; those in contact with animals and infected with H pylori, group A,

28(100 % ), group B 30( 100% ), while those who were not in contact with animals and infected with H pylori, group A 20( 62.5 % ), group B 13 ( 30.9% ). We didn't do the P value because both groups were living in the same house .

**Table 1: H. pylori status distribution of the two groups.**

Age(years)	Patient with hydatid cyst					First degree relatives						
	Total		H pylori Positive		H pylori negative		Total		H pylori positive		H pylori Negative	
	No.	No	%	No	%	No.	No	%	No	%		
< 20	18	11	61.1	7	38.9	7	0	0	7	100		
20—39	31	26	83.9	5	16.1	28	13	46.4	15	53.6		
=>40	11	11	100	0	0	37	30	81.1	7	18.9		
Mean±SD		30.40±12.68		18.83±6.99			44.02±10.24		31.17±12.60			
P value	0.029*					0.0001*						

**Table 2: The age distribution of the two groups.**

H. PYLORI STATUS	Patient with hydatid cyst Group A		First degree relatives Group B		P value
	No.	%	No.	%	
H pylori positive	48	80.0	43	59.7	0.012*
Negative	12	20.0	29	40.3	
Total	60		72		

**Table 3: The sex distribution of the two groups.**

Sex	Patient with hydatid cyst					First degree relatives						
	Total		H pylori positive		H pylori negative		Total		H pylori positive		H pylori negative	
	No.	No	%	No	%	No.	No	%	No	%		
Male	15	11	73.3	4	26.7	42	26	61.9	16	38.1		
Female	45	37	82.2	8	17.8	30	17	56.7	13	43.3		
P value	0.456					0.655						

**Table 4: The residence distribution of the two groups.**

Residency	Patient with hydatid cyst					First degree relatives						
	Total		Hpylroi positive		Hpyolri negative		Total		Hpylroi positive		H pyolri negative	
	No.	No	%	No	%	No.	No	%	No	%		
Urban	24	21	87.5	3	12.5	28	15	53.6	13	46.4		
Rural	36	27	75.0	9	25.0	44	28	63.6	16	36.4		
P value	0.236					0.396						

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**Table 5: The animal contact distribution of the two groups.**

	Patient with hydatid cyst					First degree relatives				
	Total	H pylori positive		H pylori negative		Total	H pylori positive		H pylori negative	
	No.	No.	%	No	%	No.	No	%	No	%
Animal contact	28	28	100	0	0	30	30	100	0	0
No contact	32	20	62.5	12	37.5	42	13	30.9	29	69.1
P value		-					-			

### DISCUSSION:

In this study we found the prevalence of *H. pylori* in group A to be 80% and in group B to be 59.7% and this is consistent with studies done by Al-Daher and Al-Yas<sup>(9,10)</sup>.

Our data shows a substantial and significant relation between hydatid disease and *H. pylori* infection which was 80% as compared to the first degree relatives who didn't have hydatid cyst disease which was only 59.7% with a significant P value (P= 0.012) and this result was similar to that found by Al-hilali et al<sup>(13)</sup> who found also a significant relation between *H. pylori* and intra abdominal hydatid cyst disease, in which the P value was (P < 0.01) the explanation for this result might be as following (although we did not have comparison for the prevalence of *H. pylori* in patients and controlled groups with the general population):

The ovum of hydatid cyst is digested in the duodenum, the enzymatic digestion of the egg shell releases embryonic form of the organism which then passes through the intestinal wall into the portal circulation and develops into a cyst within the liver<sup>(14,15)</sup>, and as we mentioned before *H. pylori* damages the mucous coating that lines the stomach and duodenum, resulting in inflammation<sup>(16)</sup>, and this might assist the embryonic form of the organism to penetrate into the lamina propria of duodenum more easily than non infected patients, and then transported passively through blood or lymphatics.

For the age distribution we found both groups had an increase in the prevalence of *H. pylori* with increasing age. It was in group A (100%) for those whose age ( $\geq$  40 years), while in group B, (81.1%) for those whose age ( $\geq$  40 years), and this result was close to that found by Khan et al<sup>(17)</sup> which was (48%), (52%), (61%), for those ages (21-30), (31-40), (41-50) years respectively, this finding further substantiates the age of acquisition of *H. pylori*, since infection with *H. pylori* is a long-term chronic infection<sup>(17)</sup>.

For the sex distribution our study shows that there is no significant difference between males and females in both groups and it was as following, (73.3%), (82.2%) for male and female in sequence in hydatid patients who are positive for *H. pylori* and it was (61.9%), (56.7%) for males and females in sequence in the first degree relatives, P values were (P= 0.456) and (P= 0.655), this result is similar to that found by Khan et al<sup>(17)</sup> which was (45%), (56%) in males and females in sequence.

For the residence there was no significant difference between rural and urban areas in both groups in relation to *H. pylori* infection P value (P= 0.236), (P= 0.396), we didn't find a study to compare with it, so our explanation for this result is that nowadays, there is no difference in sanitation and animal contact between rural and urban area in our country.

### CONCLUSION:

1. although we didn't take a large numbers of people, but from this study we allocate a significant positive relationship between the presence of *H. pylori* and liver Hydatid disease.
2. There is a significant positive relationship between the presence of *H. pylori* and advancing age.

### Recommendations :

Further studies are required to confirm the association between the eradication of *H. pylori* infection and the prevention of liver Hydatid disease and its recurrence. taken a large numbers of persons in the general populations.

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