

Research article

Prevalence of *Helicobacter pylori* as coinfection in Iraqi patients infected with viral hepatitis types

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ABSTRACT

Helicobacter pylori is slightly responsible for liver diseases in many countries, prevalence of *H. pylori* as co-infection in Iraqi patients with viral hepatitis types problem is scanty in literature. Here, 63 Iraqi patients infected with viral hepatitis types HAV, HBV, HCV and HEV diagnosed by sera examination were recognized with bioelasia kit, and 30 healthy persons as a control were studied. The patients and healthy persons screened for *H. pylori* infection by examine anti- *H. pylori* in their sera. The result of diagnostic tests was analyzed statistically by percentage ratio, chi-square test, relative risk ratio and odds ratio. The results of showed that the relative risk of a viral hepatitis patients getting *H. pylori* was 74.6% about four times higher than risk of control getting *H. pylori* (16.7%), each of chi-square test, relative risk ratio and odds ratio showed significant differences values. The percentage of positive *H. pylori* in viral hepatitis types A, B, C and E types were 7.9%, 47.6%, 15.9% and 6.34%, respectively. The study demonstrated high prevalence of *H. pylori* in patients with HBV compared with patients infected with other types of hepatitis. Also the study manifested high percentage in male with coinfection of *H. pylori* compare with female, while the percentage of positive infected of *H. pylori* in viral hepatitis types depending on gender and type of hepatitis virus. In the HBV the highest percentage in male and female 39.7% and 22.2% respectively and in the HEV was the lowest percentage in male and female 4.8% and 6.3%, respectively.

Keywords: Coinfection, Gender, *Helicobacter pylori*, Iraqi patients, Viral hepatitis types.

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INTRODUCTION

In the present time coinfection is one of the major global health challenges, which is mean the simultaneous infection of human by multiple different pathogens and treatment diseases in traditional biomedical as if they were distinct entities that existed in nature separate from other diseases as which they are found. Globally hepatitis virus and *Helicobacter pylori* are respectively the leading viral and

and bacterial human disease etiologies [1]. Hepatitis is a systemic disease primarily involving the liver as a main target for viral replication which is characterized clinically by fever, jaundice and gastrointestinal symptoms [2]. There are a several pathogenic agents besides the viruses that cause liver infection such as bacteria, parasites, fungi and chemical agents including drugs, toxins and alcohol [3].



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Viral hepatitis is the most important cause of liver disease worldwide [4]. Viral hepatitis caused by one of the specific hepatitis viruses: hepatitis A virus (HAV), hepatitis B virus (HBV), hepatitis C virus (HCV), hepatitis D virus (HDV), hepatitis E virus (HEV) [3], hepatitis G virus (HGV) and Transfusion transmitted virus (TT virus) [5]. Viral hepatitis effects on hundreds millions of people worldwide which is causing acute and chronic disease and killing close to 1.4 million people every year [6] and the most common cause of liver inflammation.

H. pylori infection is a major global health issue. Since the infection with *H. pylori* is common, about two-thirds of the world's population have it in their bodies and acquired the infection through early in life, especially among poverty stricken groups. *H. pylori* is noninvasive [1], for most people, it doesn't cause ulcers or any other symptoms. However, *H. pylori* infection is linked with the development of certain upper gastrointestinal diseases. This bacterium cause of chronic gastritis; peptic ulcer disease, gastric cancer and mucosa-associated lymphoid tissue lymphoma [7]. Treatment and eradication of *H. pylori* infection cure duodenal or gastric ulcers in over 80% of patients [8].

There is numerous lines of evidence indicate a correlation between *H. pylori* and liver disease [9], and many studies found there is association between hepatitis and *H. pylori* [1,10-12] and documented in different parts of the world. Therefore the present study was carried out to investigate the status and presence of *H. pylori* antibodies in Iraqi patients infected previously with different types of hepatitis (A, B, C, and E).

MATERIALS and METHODS

Patients and Methods

This study included 93 Iraqi subjects, 30 of them were apparently healthy without viral hepatitis infection who considered as a control group, while 63 serum samples were collected from hepatitis patients with different types (A, B, C and E) and tested for *H. Pylori* as coinfection.

The sampling and work conducted at Central Public Health Lab, Baghdad, Iraq.

Serological test

The serological method of enzyme-linked immunosorbent assay (ELISA) for detecting IgG via Bioelisa kit (Werfen, USA) and Microtiter plate ELISA tests were used for diagnosis of each of hepatitis B (all markers), hepatitis A, hepatitis C, hepatitis E, in addition to diagnose *H. pylori* IgG antibody in patients and controls sera.

Statistical analysis

Minitab version 13 was used to perform the statistical analysis. Nominal data was tabulated and analyzed using the means, relative risk (RR), odds ratio (OR) and chi-square test. The relative risk (risk ratio) is an intuitive way to compare the risks for the two groups.

An odds ratio (OR) is a measure of association between an exposure and an outcome. The OR represents the odds that an outcome will occur by given a particular exposure, compared to the odds of the outcome occurring in the absence of that exposure [13].

RESULTS

Table 1 showed the percentage of positive *H. pylori* in hepatitis patients, which was 74.6% and 16.7 % in control. The RR was 4.48 and the OR was 14.7.

Table 1. Percentage of *H. pylori* in hepatitis patients and healthy control. DF, degree of freedom; P, probability value; OR, odds ratio; RR, relative ratio; CI, confidence interval; Z statistic, statistical measurement of a score's relationship to the mean in a group of scores.

<i>H. pylori</i> (%)	Hepatitis patients	control	Chi-square= 27.673 DF = 1 P-Value = 0.000
Positive	47(74.6%)	5(16.7%)	
Negative	16(25.4%)	25(83.3%)	
OR= 14.7 4.722	CI 95% = 4.8 P < 0.0001	to 44.8	Z statistic =
RR= 4.48 3.613	CI95% = 1.99 P = 0.0003	to 10.1	Z statistic =

The results in **table 2** showed that the percentage of positive cases of *H. pylori* in patient of hepatitis virus type B (HBV), C (HCV), A (HAV) and E (HEV) were 47.6% , 15.9 % , 7.9% and 6.34%, respectively. While the percentage of negative cases of *H. pylori* in patients infected with hepatitis virus type B (HBV), C (HCV), A (HAV) and E (HEV) were 11.1%, 20.6%, 20.6% and 20.6%, respectively.

The current study showed that the total positive percentage of *H. pylori* infection from 63 patients of hepatitis was 74.6 % and distributed to 50.8% male and 23.8% female, while the negative percentage of *H. pylori* infection was 25.4% distributed to 12.7% for each gender (**Table 3**).

The results in **table 4** showed that the percentage of positive cases of *H. pylori* markers in the hepatitis infected patients with HAV, HBV, HCV and HEV for male and female was (7.9 and 4.8 %), (39.7 and 22.2 %), (14.3 and 6.3 %) and (4.8 and 6.3%), respectively.

DISCUSSION

H. pylori and viral hepatitis infection are major global health problem which the world health organization (WHO) has recognized as a carcinogenic participate in gastric cancer [6]. When we compared the percentage of positive *H. pylori* in hepatitis patients and control there was significant differences between hepatitis patients and control. The OR is 14.7, which points at the clear risk of particular exposure to *H. pylori* infection in whom getting viral hepatitis compared to control group. The RR= 4.48 means the hepatitis groups has four times the risk of a control group in getting *H. pylori*, this could include *H. pylori* as a risk factor for viral hepatitis progression and which highlights the importance of critical evaluation of *H. pylori* as a key feature of evidence based medicine in viral hepatitis patients (**table 1**). This agrees with previous studies [9 -11] that the reveals the prevalence of *H. pylori* in viral hepatitis patients is much more incidence than in healthy controls.

The present study agrees with others that showed *H. pylori* infection is a risk factor for the development towards liver cirrhosis because these bacteria can produce toxins that may interfere with hepatic cells [14]. The results of **table 2**

Table 2. Percentage of positive cases of *H. pylori* in patients infected with different viral hepatitis. DF, degree of freedom; P-Value, probability value.

<i>H. pylori</i> (%)	HAV (%)		HBV (%)		HCV (%)		HEV (%)	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
Positive	5(7.9%)	42(66.6%)	30(47.6%)	17(27%)	10(15.9%)	37(58.7%)	4(6.34%)	43(68.3%)
Negative	3(4.8%)	13(20.6%)	9(14.3%)	7(11.1%)	3(4.7%)	13(20.6%)	3(4.7%)	13(20.6%)
Total	8(12.7%)	55(87.3%)	39(61.9%)	24(38.1%)	13(20.6%)	50(79.4%)	7(11.1%)	56(88.9%)
X ²	X ² = 0.708		X ² = 0.291		X ² = 0.047		X ² = 1.267	
DF	DF = 1		DF = 1		DF = 1		DF = 1	
P-Value	P-Value = 0.4		P-Value = 0.590		P-Value = 0.829		P-Value = 0.260	

showed a significant difference between the percentage of positive *H. pylori* infection in each of hepatitis virus A, B, C and E type patients, but when compared to negative cases there was no significant association among HAV, HBV, HCV, HEV ($p > 0.05$). This study demonstrates a higher prevalence of *H. pylori* in patients with HBV (61.9%) compared with other types of hepatitis.

Table 3. Percentage of *H. pylori* infection in viral hepatitis patients in both genders. DF, degree of freedom; P-Value, probability value.

Gender	<i>H. pylori</i>	
	Positive (%)	Negative (%)
Male(40)	32(50.8)	8(12.7)
Female(23)	15(23.8)	8(12.7)
Total	47(74.6)	16(25.4)
Chi-Sq = 1.684	DF = 1	P-Value = 0.194

The increase in *H. pylori* prevalence in chronic hepatitis patients agrees with previous study [15]. The study confirms the association between the presences of *H. pylori* in the liver viral hepatitis disease in Iraq with other studies in other countries [12,14-17], while the lowest percentage of positive *H. pylori* infection was in case of infection with HEV type patients (11.1%).

There was a significant difference between male and female in the percentage of *H. pylori* positive infection among hepatitis virus patients totally, whereas the positive percentage of *H. pylori* prevalence in hepatitis virus male patients was 50.8%, while the same percentage in female

patients was 23.8% (nearly a half value), but the negative percentage of it in both male and female groups was equal to 12.7%, and this may indicate to the effective role of gender in infection with *H. pylori* among whom get hepatitis virus in Iraqi population (table 3).

The results in table 4 manifested that the percentage of positive *H. pylori* infection in all types of hepatitis virus male patients group was higher than it in female group, except the HEV type, which showed the percentage among female more than it in male, perhaps due to chance or in other words it may statistically because the small size HEV sample group (only 7 patients). This is the first study on prevalence of *H. pylori* as coinfection patients with viral hepatitis types in Iraqi. The study improved that there is a high prevalence of *H. pylori* as coinfection in Iraqi patients with viral hepatitis types. The percentage of *H. pylori* positive infection in HBV patients is the biggest group when compare with other types, with significant differences between male and female Iraqi patients, where the prevalence of *H. pylori* as coinfection in Iraqi male patients with viral hepatitis types was thereabouts double of its value in females, so the study recommend conducting additional prospective studies to clarify the effects of these pathogens and development together as coinfection. Our study suggests the importance of *H. pylori* checking of patients with viral hepatitis.

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Table 4 Percentage of positive cases of *H. pylori* in viral infected patients divided according to genders.

Gender	HAV (%)		HBV (%)		HCV (%)		HEV (%)		<i>H. pylori</i> (%)	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
Male(40)	5(7.9)	35(55.6)	25(39.7)	15(23.8)	9(14.3)	31(49.2)	3(4.8)	37(58.7)	32(50.8)	8(12.7)
Female(23)	3(4.8)	20(31.7)	14(22.2)	9(14.3)	4(6.3)	19(30.2)	4(6.3)	19(30.2)	15(23.8)	8(12.7)
Total	8(12.7)	55(87.3)	39(61.9)	24(38.1)	13(20.6)	50(79.4)	7(11.1)	56(88.9)	47(74.6)	16(25.4)

Conflict of interest

The authors declare that they have no conflict of interests.

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