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Study of Helicobacter pylori infection in liver cirrhosis secondary to Hepatitis C Virus infection

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Abstract:

Helicobacter pylori is a microaerophile Gram-negative bacillus, resistant to the activity of gastric juice. The bacteria may take the vegetative form (spiral shape) or sporulation form .Liver cirrhosis and H.Pylori infection are two common diseases in our population and reducing the incidence of complications in cirrhotic subjects is an important step in current gastroenterology practice. The aim of the present study is to determine incidence of H. Pylori infection among patients with liver cirrhosis secondary to HCV infection and study the correlation between esophageal varices degree and H. Pylori infection. This study involved 50 patients with liver cirrhosis secondary to Hepatitis C Virus infection were selected from gastroenterology and internal medicine clinics at Beni-Suef general hospital and Beni-Suef university hospital. Our results illustrate that the percent of H. pylori infection among studied patients was 68%, our results illustrate that there is statistically significant association between the grade of varices and the detection of H. pylori; p value is less than 0.001.

Keywords: Helicobacter pylori infection; liver cirrhosis; Hepatitis C Virus infection**.**

1. Introduction:

Helicobacter pylori is a microaerophile Gram-negative bacillus, resistant to the activity of gastric juice. The bacteria may take the vegetative form (spiral shape) or sporulation form. H. pylori lives mainly on the surface of epithelial cells of mucous membranes of the prepyloric part of the stomach. The cilia present on the bacteria allow it to move in to inter cellular spaces and adhere to the surface of cells. Infection with these bacteria is one of the most common in the world. In highly developed

countries, 50% of the population is infected [1]

H.pylori possesses five major outer membrane protein families. The largest family includes know and putative adhesinse. The other four families are porins, iron transporters, flagellum-associated proteins and proteins of un known function [4] The overall prevalence of 44.3% worldwide. This rate ranged from 50.8% in developing countries compared with 34.7% in developed countries. The global H.pylori infection rate was 42.7% in female compared to 46.35 in male the prevalence in adult (≥18 years) were significantly higher than in children (48.6% v. 32.6%,respectivilay.There was statistically non significantly decrease in the perseverance in 2009-2019 compared with the 2000-2009 period [8]

In the group of patients infected with H. pylori, morphologic studies on liver of patients infected with hepatitis C virus (HCV), and patients with chronic non-infectious liver diseases have demonstrated the presence of H. pylori DNA in the per hepatic tissues. Such an infection is caused by disturbances of immunologic functions in this group of patients .H. pylori infection influences the disturbances of lipid metabolism. This is especially important in the metabolism of hepatocytes and liver fibrosis[7]

In the course of liver cirrhosis, pathological lesions often appear in the mucous membranes of the stomach .Portal gastropathy is a chronic inflammatory state that occurs most frequently .H. pylori infection in the group of patients with liver cirrhosis may influence exacerbation of inflammatory lesions in the stomach, which could directly and indirectly lead to impairment of liver function .This is especially dangerous in patients with advanced liver injury [6].

2. Patients and Methods:

This study involved 50 patients with liver cirrhosis secondary to Hepatitis C Virus infection were selected from gastroenterology and internal medicine clinics at Beni-Suef general hospital and Beni-Suef university hospital. All subjects had the routine laboratory examination include; CBC, LFTs including serum bilirubin, S. albumin, transaminases and prothrombin time, will estimate, renal function test, fasting and post prandial blood glucose.

2.1 Inclusion criteria:

All patients with chronic liver disease referred to gastroenterology and internal medicine clinics undergoing diagnostic upper endoscopy.

Exclusion criteria:

- All patients with other causes of liver disease such as hepatitis A and B virus.
- Patients with autoimmune or metabolic disease affecting liver.
- History of alcohol consumption and hepatotoxic drug.
- Patients who had been treated for H. pylori eradication.
- Advanced diabetes "HA1C more than 70%
- Patient with hepatic focal lesion.
- Patient with child C classification.
- Renal failure patient.
- Refused of consent

2.2 All participants will be subjected to the following:

1. Complete history and physical examination.
2. Laboratory examination include; CBC, LFTs including serum bilirubin, S. albumin, transaminases, INR, and prothrombin time, will estimate
3. Modified Child-Turcotte-Pugh (CTP) class will calculate for each patient.
4. Hepatitis C infection confirmed by ELISA ,PCR ,HBsAg and HBc IgM.
5. H. pylori infection diagnosis will be detected by histopathology examination of the gastric mucous membrane excised during endoscopic procedure.

Statistical methodology

The data will be coded and entered using: the statistical package for social science version 22 (SPSS v 22). The following parameters will used: Descriptive analysis of the results: The data will be summarized using (minimum, maximum, mean and standard deviation) for quantitative data and the frequency distribution for qualitative data

3. Results:

Table1 demonstrated that the percent of H. pylori infection among studied patients was 34 (68%).

Table 2 showed that there is no significant association between age and H. pylori detection while female gender, higher weight, hypertensive and diabetic were associated with positive H. pylori detection and these association were significant p value (0.004, 0.014, 0.001, 0.003 and 0.004) respectively.

Table 3 demonstrated that positive PCR, CHILD Pugh score B, splenomegaly and ascites were associated with positive H. pylori detection and these association were significant p value (0.015, 0.001, 0.006, 0.000) respectively.

Table 4 showed that there is a statistically significant association between the grade of varices and the detection of H. pylori**;** p value is less than 0.001.

Table 5 showed that higher leukocytic count, lower albumin level, higher urea and higher creatinine level were associated with positive H. Pylori detection p value (0.004, 0.001,0.002 and 0.041) respectively while measurement of haemoglobin level, platelet count, bilirubin level and INR showed no association with H. pylori infection

Table (1): Prevalence of Helicobacter pylori infection in the studied group:

H. pylori	Frequency	Percent
Negative	16	32.0
Positive	34	68.0
Total	50	100.0

Table (2): Association between detection of H. Pylori and patients' characteristics:

Variable	H pylori Negative No.=	H pylori positive No.=	P value
Age (mean± SD)	64.12 ± 5.98	67.29 ±6.32	0.099
Gender			0.004*
Female	10 (62.5%)	7 (20.6%)	
Male	6 (37.5%)	27 (79.4%)	
Weight	70.25±6.38	75.05±5.96	0.014*

BMI (mean± SD)	23.27±2.63	24.97±3.75	0.109
HTN			0.001*
Negative	13 (81.3)	9 (26.5)	
Positive	3 (18.8)	25 (73.5)	
DM			0.003*
Negative	11 (68.8)	9 (26.5)	
Positive	5 (31.3)	25 (73.5)	

Table (3): Association between detection of H. Pylori and hepatic condition:

Variable	**H pylori Negative No.=**	**H pylori positive No.=**	**P value**
PCR			0.015*
Negative	16 (100)	24(70.6)	
Positive	0 (0%)	10 (29.4)	
CHILD Score			0.001*
A	12 (75%)	1 (2.9%)	
B	4 (25%)	33 (97.1%)	
Splenomegaly			0.006*
Normal	1(6.3%)	0 (0%)	

Mild	11(68.8)	10(29.4%)	
Moderate	4(25%)	24 (70%)	
Ascites			0.000*
Absent	7 (43.8%)	0(0 %)	
Mild	9 (56.3%)	22 (64.7%)	
Moderate	0 (0%)	12 (35.3%)	

Table (4): The presence of esophageal varices in relation to detection of H pylori:

Varices grade	**H. Pylori**	
	Negative N (%)	**Positive N (%)**
0	2 (12.5%)	0 (0.0%)
1	4 (25.0%)	0 (0.0%)
2	9 (56.3%)	2 (5.9%)
3	1 (6.3%)	21 (61.8%)
4	0 (0.0%)	11 (32.4%)
Total	16 100.0%	34** 100.0%

Table (5): The mean and standard deviation of the biochemical tests among studied patients:

Biomedical test	H pylori Negative No.=	H pylori positive No.=	P value
Hemoglobin level	11.14±1.58	10.56±1.18	0.153
Leukocytic count	8.17±1.62	10.0±2.13	0.004*
Platelet count	165.7 ± 37.98	148.7 ± 27.37	0.078
Bilirubin	1.338±0.47	1.51±.54	0.260
Albumin	3.875±0.43	3.38±0.32	0.001*
Urea	43.0±11.78	68.29±30.05	0.002*
Creatinine	1.30±0.25	1.57±0.48	0.041*
INR	1.23±0.27	1.31±0.29	0.402

4. Discussion:

Our results illustrates that the prevalence of H. pylori was 68% in the patients with liver cirrhosis due to HCV infection , which is consistent with the results of [3] . The study included 40 chronic HCV patients. Laboratory investigations included liver function tests, ESR, ANA, measurement of anti-helicobacter antibodies, and helicobacter stool antigen ,which showed that a higher incidence of H. pylori infection among HCV-positive patients versus people not infected with the virus.

Our results illustrates that there is significant association between hypertensive, diabetic patients with positive H. pylori detection and these association were significant p value (0.004, 0.014, 0.001, 0.003 and 0.004) respectively, which is consistent with the results of [1] included 93 patients, which showed that H. pylori infection was found

in 73.11% of diabetic patients versus 58.05% in non-diabetic participants, this difference was found to be significant (OR= 1.472, p = 0.0279).

Regarding association between detection of H. Pylori and hepatic condition, the present study illustrates that splenomegaly and ascites were associated with positive H. pylori detection and these association were significant p value (0.015, 0.001, 0.006, 0.000) respectively, which is comply with the study conducted by Mohamed et al .,2019 , this study was conducted on 100 liver cirrhotic patients to detect H. Pylori infection, which demonstrated that significant association between H. Pylori infection with ascites and prospective relation between H. pylori infection and liver diseases progression due to hepatic infections especially HCV.

The present study demonstrated that statistically significant association between the grade of esophageal varices and the detection of H. pylori; the p-value is less than 0.001, which is consistent with the results of [7] , the study included 147 patients with liver cirrhosis: 42 were infected with hepatitis C virus, which showed that incidence of H. pylori infection in patients without esophageal varices was significantly lower compared with patients with esophageal varices (14 vs. 60%; P<0.001).

Regarding to biomedical tests the results of present study illustrates that no association between platelet count, bilirubin level and INR with H. pylori infection this agreed with the study conducted by [1], this study included a 49patients with liver cirrhosis which showed that no association between, platelet count, bilirubin level with positive H. Pylori infection.

Our results illustrates that there is a significant correlation between leucocytic count and albumin and detection of H. pylori ,these results agreed with the results of [5] this the study included 100 patients of post hepatitis C liver cirrhosis which showed a significant correlation between H. pylori infection with leucocytic count, Platelet count and albumin.

5. Conclusion:

H. pylori infection is significantly frequent among patients with liver cirrhosis secondary to HCV infection. The incidence of esophageal varices correlates with the incidence of H. pylori infection.

6. Recommendations:

First, larger cohort studies and comparative studies & follow up the cases to better assess.

Second, further research is needed to reveal the precise mechanism involved in the relationship between H.pylori and hepatitis C , also Additional in-depth studies are required to confirm the actual

involvement of H. pylori in the progression of liver fibrosis

Third, presence of H. pylori infection should be searched for in all patients with chronic hepatitis and liver cirrhosis as well as its cure would at least reduce the risk of bleeding due to peptic ulcer.

7. References:

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