COMPARISON OF HELICOBACTER PYLORI INFECTION AND PEPTIC ULCER DISEASE IN CIRRHOTIC AND NON CIRRHOTIC PATIENTS

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ABSTRACT

Objective: This study aims to evaluate the relationship of helicobacter pylori infection and peptic ulcer disease in cirrhotic patient in order to clarify its role in ulcer pathogenesis.

Methods: Among 160 participants, two groups were formed (cirrhotic and non-cirrhotic) based on chemical, biochemical and radiologic findings. Helicobacter pylori serology was done to diagnose h-pylori positive patient. Peptic ulcer bleed was classified according to forrest classification. Upper gastrointestinal endoscopies were performed followed by colonoscopy, incase if there was ulcer in the duodenum to confirm that the bleed was from that specific ulcer. Endoscopy was performed by 4 interventional Gastroenterologist. The data recorded for each patient was demographic variables including age, gender, H-pylori serology, endoscopic findings and routine blood tests.

Results: In 160 participants the mean age was 50±3 year with minimum and maximum ages being 40 and 60 respectively. The study distribution of males to females was equal i.e. 50%. Similarly 23.1 % patients were below 50 years while 76.9% were above 50 years. H-pylori serology was positive in 57.1% while 42.9% were negative. The results reveal that there is no statistically significant association between liver cirrhosis (p-value 0.05) and h-pylori infection. However, female gender was significantly associated with h-pylori infection (p–value <0.001). There was no association between age and h- pylori infection (p- value 0.50).

Conclusions: Our study concludes that there is no strong association between liver cirrhosis and h-pylori infection. However, female patients have higher frequency of h-pylori infection than male. The endoscopic finding also reveals that cirrhotic patients had severed PUD endoscopic features as compared to non-cirrhotic patients.

Keywords: Gastrointestinal Endoscopy, H-pylori, Liver Cirrhosis, Peptic ulcer disease

INTRODUCTION

Peptic ulcer disease (PUD) is one the most important risk factors for bleeding worldwide (1). Among the patient presenting with ulcer of gastrointestinal track 85% are gastric and 95% are duodenal ulcers is due to h-pylori infection (2). It is also related to non steroidal anti-inflammatory drugs mainly aspirin, about 4% of cases which has no root cause are included in idiopathic peptic ulcer group (3). It is a major cause of acute non variceal gastrointestinal bleeding (3). Forrest classification is to categorized high-risk PUD based on endoscopic features (4). The clinical endoscopic features of forrest IA and IB include active bleeding with spurting/oozing hemorrhage. Forrest IIA includes visible vessel (no bleeding) while visible vessel with adherent clot is classified as forrest IIB. Previous studies showed that re-bleeding was major predictors for patient with PUD including active bleeding, hemodynamic instability, large ulcer size at endoscopy (5). The life threatening condition is the upper gastrointestinal bleeding with a mortality rate in between 4 to 15% (6). Gastro duodenal ulcers are very common in cirrhotic patients (30-40%) having non-variceal upper gastrointestinal (GI) bleeding (7). The molecular mechanism related to the stomach and duodenal ulcers is yet to be elaborated but increasing age, helicobacter pylori (h.pylori) infections and prolong use of non-steroidal anti-inflammatory drugs (NSAIDs) are the common risk factors for these ulcers in both cirrhotic and non-cirrhotic patients (8). Among these risk factors h.pylori infections is one of the profound factors in the development of PUD but its role in cirrhotic patients still needs further elaboration (9, 10). There is controversial data related to PUD and h.pylori infection in cirrhotic patients. Furthermore, such studies are lacking in our population. Thus through this study, the association of h.pylori with PUD in cirrhotic patients will be evaluated and will compared with non-cirrhotic patients.

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MATERIALS AND METHODS

This study was completed in gastroenterology unity, Mardan Medical Complex (MMC). The duration of the study was 6 months started from January 2024 to June 2024. This study was approved by the ethical board MMC via letter no 589/BKMC. Total sample size of the study was 160. The sample size was calculated using web-based tool Open epi (www.openepi.com) where prevalence of the disease was 9% (11). Margin of error was 5% and 95% confidence interval. The age limit for inclusion criteria was in between 40 to 65 year of either gender. Those patient having any other metabolic syndrome including diabetes, hypertension and those who were not willing to be enrolled in study was excluded. All the patients were verbally counseled and those willing to participate in the study were included. All patients with upper gastrointestinal bleed and melena were admitted to our 16 beds gastroenterology unit. In 160 participants, two groups were formed i.e. cirrhotic and non-cirrhotic based on chemical, biochemical and radiologic findings. Peptic ulcer bleed was classified according to Forest classification (4). Helicobacter Pylori serology was done to diagnose H-pylori positive patient. Upper GI endoscopies were performed followed by colonoscopy if there was clean based ulcer in the duodenum to confirm that the bleed was from the ulcer. Endoscopy was performed by 4 interventional Gastroenterologist, each have done more than 500 therapeutic interventions. The data recorded for each patient was demographic variables including age, gender, H-pylori serology, endoscopic findings and routine blood tests. All the data were entered in SPSS version 22.0. Descriptive statistical model was used to represent the demographic characteristics of the patients including age, gender.

The mean difference between different study parameters in cirrhotic and non-cirrhotic patients were identified by independent sample t test. Chi-square test was applied where possible to find the possible association between two categorical variables. All the selected values were two tailed and the level of significance was <0.05.

RESULTS

Demographics of study participant

Descriptive statistic model was used to determine the demographics of the patients. In total 160 participants the mean age was 50±3 year with minimum and maximum ages being 40 and 60 respectively. The study distribution of males to females was equal i.e 50%. Similarly 23.1 % patients were below 50 years while 76.9% were above 50 years. H-Pylori serology was positive in 57.1% while 42.9% were negative. All the details are shown in Table 1.

Table 1: Demographics of patient (n=160)

Variables	Type	Frequency	Percentage
Cirrhosis	Yes	78	50%
	No	78	50%
Gender	Male	78	50%
	Female	78	50%
Age (years)	≤ 50	36	23.1%
	≥ 50	120	76.9%
H. Pylori serology	Positive	89	57.1%
	Negative	67	42.9%

To find the possible association between different study parameters with cirrhotic liver, chi-square test was applied. The results reveal that no statistical significant association between Gender (p-value 1) and h-pylori serology (p-value 0.71) with liver cirrhosis. Whereas, liver cirrhosis was significantly associated with Peptic ulcer disease specifically forrest Ia (p value 0.04) and forrest IIb (p-value 0.003), forrest III taken as a reference. All the results are given in table 2 while the significant association of all classification of peptic ulcer and cirrhosis is shown in figure 1

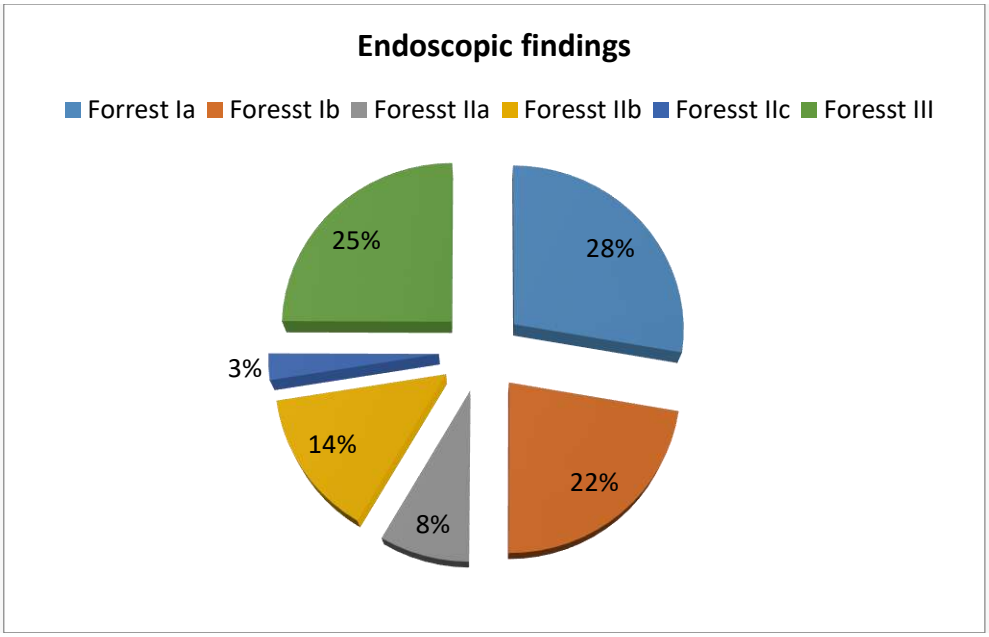

Figure 1: Endoscopic finding of peptic ulcer disease according to Forrest classification (4)

Table 2: Association of different parameters with H. Pylori infection

Variables	Sub category	H. Pylori infection		P-value
		Negative	Positive	
Cirrhosis	Yes	50	28	0.05
	No	39	39	
Gender	Male	56	22	<0.001
	Females	33	45	
Age	<50 years	21	15	0.50
	>50 years	68	52	

To find the possible association between different study parameters with H-pylori infection chi-square test was applied. The results reveal that no statistically significance association between liver cirrhosis (p-value 0.05) and h-pylori infection. However, Female gender was significantly associated with h-pylori infection p–value <0.001. Furthermore, the association between age and h- pylori infection is not significant (p- value 0.50)

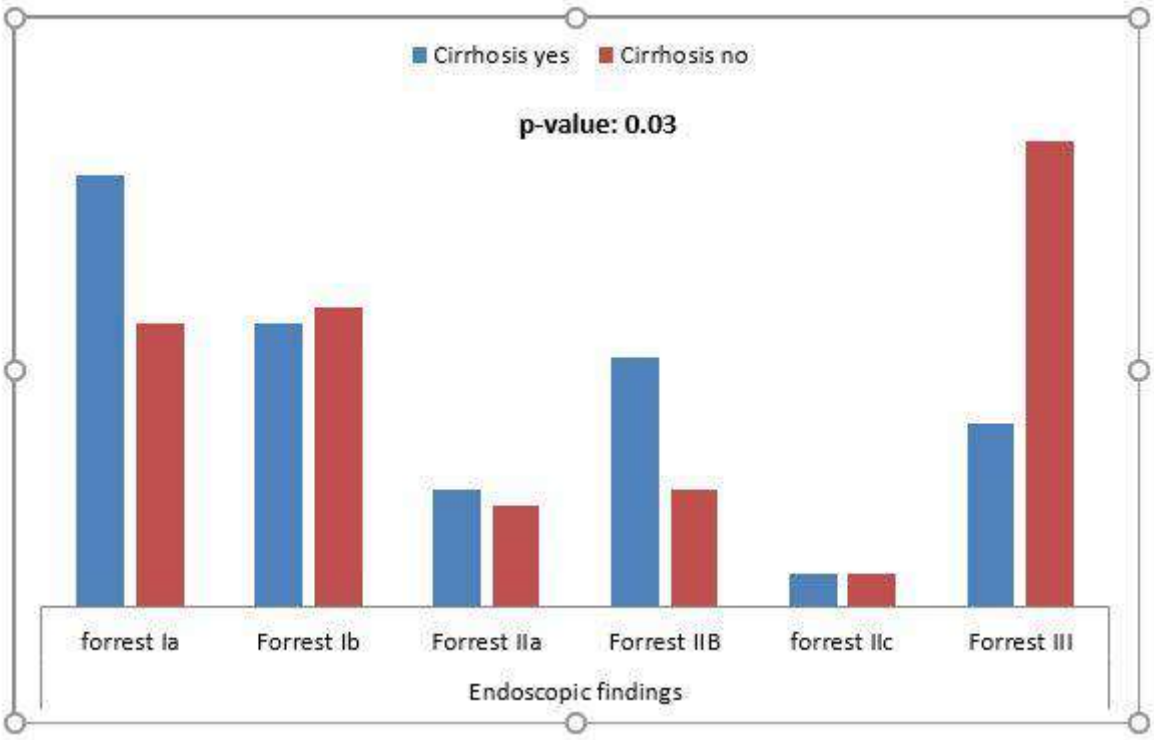

Figure 2: Distribution of endoscopic findings among cirrhotic and non-cirrhotic patients

Figure 2 summarizes the association between endoscopic findings among cirrhotic and non-cirrhotic patients. The frequency of Forrest Ia in cirrhotic and non-cirrhotic patients were 26 and 17 respectively. Similarly, the distribution of Forrest III was 11 and 28 among cirrhotic and non-cirrhotic patients. Chi-square test reveals significant association between endoscopic findings and cirrhotic patient with p-value 0.03.

DISCUSSION

In the current study, we enrolled 160 patients with 50 percent equal distribution of cirrhotic and non cirrhotic to determine the association between h pyloric infection in cirrhotic and non-cirrhotic patients and their relation with other factor including gender and age.

Our study result shows significant association between gender and h-pylori infection (p-value 0.001). Female were more likely to have peptic ulcer disease as compared to male, the main reason in increasing rate of this is due to the emerging over use of NSAIDs and high salt and spice content in food (12). These factors potentially contribute to mucosal injury, increasing susceptibility to PUD in females.

There is no significant association between age and h.pylori infection, as the young age group has been influenced by a lot of environmental factor from a very early age including stress, seasonal variation, dietary changes which shifts this graph from old toward young age group, these findings align with the observations made by Sonnenberg A et al in 1998 (13).

The current study demonstrate that there is no association between liver cirrhosis and h-pylori infection as not only h.pylori but other factors play an important role in causing peptic ulcer disease in cirrhotic patients which includes decreased gastric acid production, less production of prostaglandins, decreased mucus secretion, increase level of serum gastrin, chances in a reduction in gastric mucosa, and portal hypertensive, thus multifactorial factors are involved in the peptic ulcer disease in cirrhotic patients. These findings are consistent with those reported by Khatami et al in 2022 (14, 15).

Finally the results of this study showed strong association between endoscopic changes in PUD in cirrhotic patient as compared to non cirrhotic patient, with forrest Ia more common among cirrhotic and forrest III in non cirrhotic patients. Studies suggest that h pylori is not the only cause in causing peptic ulcer diseases in cirrhotic patient (16). Multifactorial factors are involved in causing peptic ulcer in these patients including portal hypertensive gastropathy, variceal bleeding, prolonged used of medication including steroids NSAIDs, coagulation dysfunction for which these patient are needed to be monitored closely (16, 17).

CONCLUSION

Our study concludes that there is no strong association between liver cirrhosis and h-pylori infection. However, female patients have higher frequency of h-pylori infection than male. The endoscopic finding also reveals that cirrhotic patients had severed PUD endoscopic features as compared to non-cirrhotic patients.

DECLARATION

Authors' contribution:

1. Farman Ullah Shah helps in data collection and literature review
2. Irum Mehmood helps in data analysis and finalizing the 1st draft.
3. Zainab Irshad was involved in data collection, ethical approval and preparing 1st draft
4. Muhammad Fahim conceptualizes and supervises the overall study.
5. Muhammad Naeem was involved in finalizing the data file and proof reading of the manuscript
6. Rehman uddin helped us in data collection. He is also involved in entering the data in excel and proof reading.

All the authors finalize the draft and submitted after their consent.

Conflict of interest: All the authors declare no conflict of interest.

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