Evaluation of Helicobacter Pylori Infection Prevalence in Patients with Portal Hypertensive Gastropathy in Pakistani population-A single centered study

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Abstract

Objective: To evaluate the prevalence of Helicobacter pylori in patients with portal hypertensive gastropathy in the Pakistani population.

Method: A descriptive cross-sectional study was performed on ninety patients presenting with PHG. A gastric biopsy was taken from each patient followed by histopathology for the presence of H. pylori infection.

Results: Out of ninety patients, H. pylori was found in thirty (33.3%) patients while sixty (66.7%) patients were negative for H. pylori infection. A significant prevalence of H. pylori was found in patients aged more than 50 years OR=3.50, 95% CI=1.372-8.926, (p=0.007). Moreover, gender and BMI were found insignificantly associated with H. pylori infection.

Conclusion: In conclusion, the present study revealed a significant prevalence of H. pylori infection in patients with PHG and the prevalence rises in elderly age patients in the local Pakistani population.

Keyword: H. pylori, Peptic Ulcer Disease, Portal hypertensive gastropathy, Liver cirrhosis

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Introduction

The most common pathogen causing peptic ulcer disease declared to be due to Helicobacter pylori (H. pylori), gram-negative microaerophilic bacterium that affects approximately half of the world's population, although substantial regional variation exists.[1] Generally, the prevalence of H. pylori infection tends to be high in regions of world that are underdeveloped but varies in different regions and increasing age predisposes one's to this infection. In individuals below the age of 30 years and those with an average age of 60 years, the sero-prevalence of H. pylori is approximately 30% and 63%, respectively.[2] Better living standards improve the decline in the incidence of infections in most of the developed countries where the incidence is less than 40% in the total population.[3,4] In the early stages of life, various stomach-related diseases including gastric cancer, peptic ulcer, and mucosa-associated lymphoid tissue disorder are risk factors associated with H. pylori infection while duodenal involvement is the mainly present in the later course of the disease.[5,6] Fecal-oral and oral-oral pathways are the most common route of transmission of the disease.[6] Living conditions that facilitate intimate contact between persons, such as crowded conditions and bed-sharing, are some physical risk factors for transmission.[2]

About 20 to 80% patients with portal hypertension have PHG, presented as upper gastrointestinal hemorrhage as a result of bleeding varices due to PHG.[7,8] Like other developing countries, more than 80% of the Pakistani population is also affected from H. pylori.[9] Knowing the frequency of H. pylori infection in local population with peptic ulcer disease might impact the management of the disease with poor sanitation in the form of prevention. As the gastro-intestinal complications associated with H-Pylori infection not always observed in patients with PHG.[10]

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The study rationale was to determine the prevalence of H. pylori in patients with Portal hypertensive gastropathy presenting in a tertiary care hospital. Literature data have shown that these patients have more susceptibility to H. pylori infection but some researchers have shown debatable findings. Data regarding the H. pylori infection in patients with Portal hypertensive gastropathy in the Pakistani population is scanty. The current study aimed to find the prevalence and risk of H. pylori infection with different demographic features in cases with portal hypertensive gastropathy from the Pakistani population.

Material & Methods

This cross-sectional study was conducted in Department of Gastroenterology, Jinnah Hospital, Lahore, and was dully approved by the Ethical Review Board of the institute in accordance with the declaration of Helsinki. For the study, ninety patients (42 males, and 48 females; mean age 48.87 years), diagnosed as infected with H-pylori infection detection in stool specimen were recruited. Patients of age 20-70 years either gender presenting with portal hypertensive gastropathy were included while patients having prior treatment for H. pylori eradication despite infection with HCV, HIV, and HBV viruses were excluded from the study. Informed consent was taken from each participant before his/ her enrolment while maintaining the confidentiality of the data record. Demographic information including age, gender, BMI, duration of cirrhosis, and duration of portal hypertension was recorded followed by endoscopy and biopsy for diseases presence/absence of H. pylori.

Data was presented as descriptive statistics i.e. Mean & Standard Deviation (SD) for vari-ables; age, gender, BMI, duration of cirrhosis, and dura-tion of portal hypertension. All statistical analysis was performed using SPSS version 21.0. The frequency and percentage were calculated for the qualitative variable gender and H. pylori. Post-stratification, the chi-square test was applied to compare H. pylori in stratified groups taking p-value ≤ 0.05 and odd ratio (OR) with a 95% confidence interval (CI) was considered as statistically significant.[11]

Results

The demographic and clinical information were calculated and summarized in (Table. 1). Amongst the enrolled cases, 53.33% were females and 46.67% were males (Figure. 1A) with a mean disease duration of 11.47

Table 1: *Demographic and Clinical information of the patients. [SD: Standard deviation; BMI: Basal metabolic index]*

Variables	Subjects (n=90)
Gender n (%)	
Male	42 (46.7)
Female	48 (53.3)
Age mean ±SD years	48.86±7.76
Elderly (n=)	
(20-49 years)	45 (50%)
Male	21
Female	24
(50/more than 50 years)	45 (50%)
Male	21
Female	24
Disease Duration mean ±SD years	11.46±5.02
1-5 years	15 (16.7%)
6-10 years	33 (36.7%)
More than 10 years	42 (46.7%)
BMI mean± SD kg/m2	22.86±1.86
22 or below n (%)	33 (36.7%)
More than 22 n (%)	57 (63.3%)
Frequency of disease presence on biopsy n (%)	
Present	30 (33.3%)
Absent	60 (66.7%)

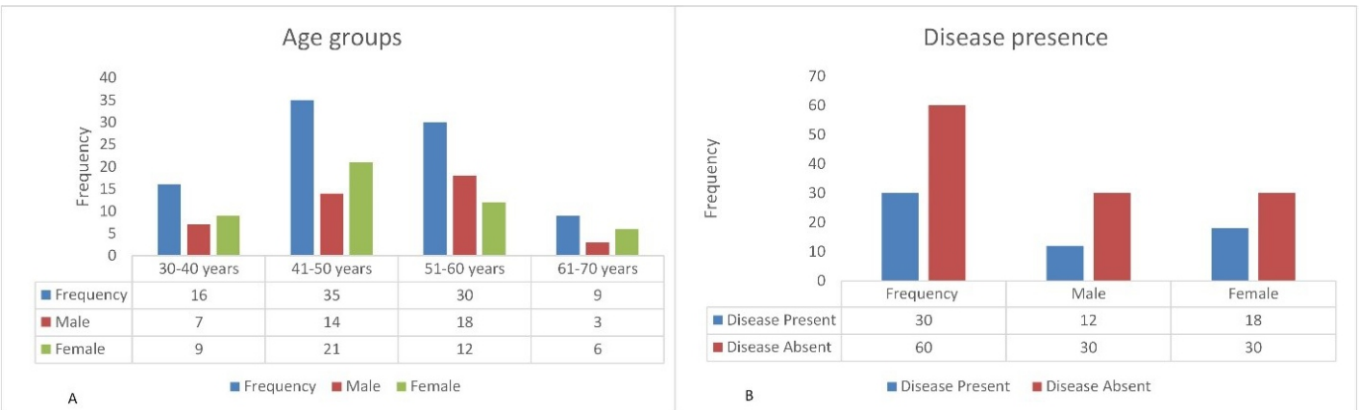

Fig-1. *Bar chart represent the age group with gender (A); Bar chart represents the disease presence in patients (B)*

years and the majority of the patients having a disease duration of more than 10 years. The age ranges (from 38 to 64) with a mean age of 48.87 years. The average BMI was observed at 22.87 with a range (from 19 to 26) kg/m^2. The frequency of H. pylori in patients with PHG was measured n=30 (33.3%) while 60 (66.7%) patients with absent disease (Figure. 1B). The relationship between demographic and H. pylori infection revealed that patients more than the age of 50 years have more susceptibility OR=3.50, 95%CI=1.372-8.926, (p-value=0.007) while gender and BMI show insignificant association OR=0.667, 95%CI=0.274-1.621, (p-value=0.370); OR=1.238, 95%CI= 0.502-3.054, (p-value= 0.643) respectively, with H. pylori infection **(Table. 2)**. Logistic regression analysis revealed that both age and BMI might be a risk factor for the disease i.e. with the increase in age (OR=1.083, 95% CI= 0.977-1.202) and BMI (OR = 1.189, 95%CI=0.900-1.571) of the patients, the risk of having the diseases is also increased **(Table. 2)**.

Discussion

PHG remains a least common cause of significant upper GIT hemorrhage in people with portal hypertension, but hemorrhage is the most detrimental consequence. A large number of individuals (2–12%) experience acute upper gastrointestinal hemorrhage due to PHG.[8] More than 2% of individuals with PHGs reportedly experience significant bleeding, and 10% of PHGs cause anemia as a result of constant blood loss.[12] On the other hand, the relevance of H. pylori on liver cirrhosis and PHG is remain unclear.[13,14]

PHG can be identified with the help of endoscopes, with the characteristic features including angiodysplasia-like lesions, mucosal edema, pigmented black-brown spots, flat red spots, mucosal granularity, and mucosa with a reticulated mosaic-like pattern.[15,16]

The aimed of our study was to determine the prevalence of H. pylori infection in patients with PHG. There was 33.3% frequency for positive H. pylori infection while 66.7% patients of PHG were negative for H. pylori infection in biopsy sample after endoscopy. In terms of positive H. pylori infection, 12 males (13.3 %) and 18 female (20 %) were found affected. Our findings are in similar direction with the studies of Abbas et al.[17] Safwat et al.[18] and Eid et al.[14] where they found less than 50% infection rate in patients with PHG with no association of H. pylori infection with disease severity. Contrary to these finding, the study of El-Toukhy et al.[19] and Kim et al.[20] had reported the significant association of H. pyloric infection with diseases severity of PHG. Furthermore, multi-variant analysis was performed and results showed PHG patients with age more than 50 years have more susceptibility towards H. pylori infection (p=0.07) while gender and BMI doesn't show the association with H. pylori disease presence (p > 0.05). These findings are in agreement with the study of Hammad et al. where H. pylori infection was found associated with PHG patients with elder ages. [21] Assessment of patients with PHG for H. pylori infection is necessary for the diseases cure. PHG patients showed better recovery after H. pylori treatment that is because after the removal of H. pylori there is decrease in pro-inflammatory cytokines (TNF-α) synthesis thus imp-rovement in mucosal inflammation and PHG severity. To the best of our knowledge, this is the first study that revealed the frequency of H. pylori's infection on PHG patients. These findings have important relevance for our understanding of the etiology of PHG and how frequent H. pylori affects the PHG and susceptible to the elderly patients.

This study has several significant limitations, including

Table 2: *Comparison of variables with susceptibility of H. pylori infection [OR: odds ratio; CI: confidence interval; p-value is considered as statistically significant when ≤0.05 (in bold)].*

Variable	Category	Disease Present	Disease Absent	Crude OR (95% CI)	Crude p-value	Adjusted OR (95%CI)	Adjusted p-value
Gender	Male	12 (13.3%)	30 (33.3%)	0.667	0.370	0.565 (0.212-1.505)	0.253
	Female	18 (20%)	30 (33.3%)	(0.274-1.621)			
Age	Less than 50 years	21 (23.3%)	24 (26.7%)	3.50	0.007	1.083 (0.977-1.202)	0.130
	50 or more than 50 Years	09 (10%)	36 (40%)	(1.372-8.926)			
Disease Duration	1-5 years	9 (10%)	6 (6.7%)	0.52	0.056	0.95 (0.845-1.173)	0.955
	6-10 years	9 (10%)	24 (26.7%)	(0.38- 1.240)			
	More than 10 years	12 (13.3%)	30 (33.3%)				
BMI	22 or below	12 (13.3%)	21 (23.3%)	1.238	0.643	1.189 (0.900-1.571)	0.224
	More than 22	18 (20%)	39 (43.3%)	(0.502-3.054)			

the fact that it was conducted in a single tertiary hospital, involved less sample cohort, and had a limited follow-up duration. Therefore, more extensive multicenter trials with a large population size, would be necessary to validate the current investigation findings.

Conclusion

In conclusion, our study demonstrated that patient with portal hypertensive gastropathy has susceptibility to infection with Helicobacter pylori with a frequency of 33.33%. Moreover, patients above age of 50 years have a significant association with H. pylori susceptibility. However, H. pylori infection in patients is independent of gender and BMI. Therefore, it is suggested that PHG patients infected with H. pylori must have eradicated the H. pylori infection to combat the serious sequel of the diseases, with additional use of local protective agents like sucralfate.

Conflict of interest *None*

Funding Source *Yes*

References

1. Peleteiro B, Bastos A, Ferro A, Lunet N. Prevalence of Helicobacter pylori infection worldwide: a systematic review of studies with national coverage. Digestive diseases and sciences. 2014;59(8):1698-709.
2. Webb P, Knight T, Greaves S, Wilson A, Newell D, Elder J, et al. Relation between infection with Helicobacter pylori and living conditions in childhood: evidence for person to person transmission in early life. Bmj. 1994; 308(6931):750-3.
3. Awdalla HI, Ragab MH, Hanna LN. Environmental risk factors affecting transmission of Helicobacter pylori infection in Egypt. Journal of Public Health. 2010; 18(3): 237-44.
4. Bakka AS, Salih BA. Prevalence of Helicobacter pylori infection in asymptomatic subjects in Libya. Diagnostic microbiology and infectious disease. 2002;43(4): 265-8.
5. Ng HK, Goh KL, Chuah KH, Thalha AM, Kee BP, Por LY, et al. Sequencing-based detection of 23S rRNA domain V mutations in treatment-naïve Helicobacter pylori patients from Malaysia. Journal of global antimicrobial resistance. 2020;23:345-8.
6. Brown LM. Helicobacter pylori: epidemiology and routes of transmission. Epidemiologic reviews. 2000; 22(2):283-97.
7. Sarin SK, Shahi HM, Jain M, Jain AK, Issar SK, Murthy NS. The natural history of portal hypertensive gastropathy: influence of variceal eradication. The American journal of gastroenterology. 2000;95(10):2888-93.
8. Merli M, Nicolini G, Angeloni S, Gentili F, Attili AF, Riggio O. The natural history of portal hypertensive gastropathy in patients with liver cirrhosis and mild portal hypertension. Official journal of the American College of Gastroenterology| ACG. 2004; 99(10): 1959-65.
9. Kuo Y-T, Liou J-M, El-Omar EM, Wu J-Y, Leow AHR, Goh KL, et al. Primary antibiotic resistance in Helicobacter pylori in the Asia-Pacific region: a systematic review and meta-analysis. The lancet Gastroenterology & hepatology. 2017;2(10):707-15.
10. Jun YK, Kim JW, Kim BG, Lee KL, Jung YJ, Kim W, et al. Helicobacter pylori infection is not associated with portal hypertension-related gastrointestinal complications: A meta-analysis. PLoS One. 2022; 17(1): e0261448.
11. Rongling W, Li B. A multiplicative-epistatic model for analyzing interspecific differences in outcrossing species. Biometrics. 1999;55(2):355-65.
12. Chung WJ. Management of portal hypertensive gastropathy and other bleeding. Clinical and molecular hepatology. 2014;20(1):1.
13. Al Mofleh IA. Does Helicobacter pylori affect portal hypertensive gastropathy? Saudi Journal of Gastroenterology. 2007;13(2):95.
14. Eid KA-A, Shawky MAE-G, Hassan AM, Mohammed AQ, Mohammed MI. Prevalence of Helicobacter pylori infection in patients with portal hypertensive gastropathy owing to liver cirrhosis in Upper Egypt. Al-Azhar Assiut Medical Journal. 2016;14(3):109.
15. Papazian A, Braillon A, Dupas J, Sevenet F, Capron J. Portal hypertensive gastric mucosa: an endoscopic study. Gut. 1986;27(10):1199-203.
16. Calés P, Zabotto B, Meskens C, Caucanas J-P, Vinel J-P, Desmorat H, et al. Gastroesophageal endoscopic features in cirrhosis: observer variability, interassociations, and relationship to hepatic dysfunction. Gastroenterology. 1990;98(1):156-62.
17. Abbas Z, Yakoob J, Usman MW, Shakir T, Hamid S, Jafri W. Effect of Helicobacter pylori and its virulence factors on portal hypertensive gastropathy and interleukin (IL)-8, IL-10, and tumor necrosis factor-alpha levels. Saudi Journal of Gastroenterology: Official Journal of the Saudi Gastroenterology Association. 2014;20(2):120.

18. Safwat E, Hussein HA, Hakim SA. Helicobacter pylori in Egyptian patients with HCV-related liver cirrhosis and portal hypertensive gastropathy: Prevalence and relation to disease severity. Life Science Journal. 2015; 12(3):168-73.
19. Alarfaj SJ, Mostafa SA, Abdelsalam RA, Negm WA, El-Masry TA, Hussein IA, et al. Helicobacter pylori Infection in Cirrhotic Patients With Portal Hypertensive Gastropathy: A New Enigma? Frontiers in medicine. 2022;9.
20. Kim DJ, Kim HY, Kim SJ, Hahn TH, Jang MK, Baik GH, et al. Helicobacter pylori infection and peptic ulcer disease in patients with liver cirrhosis. The Korean journal of internal medicine. 2008;23(1):16.
21. Hammad OM, Abu-Seif Ma, Ashour M, Hifnawy T. Correlation of portal hypertensive gastropathy with Helicobacter Pylori infection, liver dysfunction, hypersplenism and oesophageal varices. The Medical Journal of Cairo University. 2009;77:597-601.

Authors Contribution

AP: Conceptualization of Project
SN, AP: Data Collection
FT: Literature Search
AP, SB: Statistical Analysis
HS, AP: Drafting, Revision
AP: Writing of Manuscript