Original Article

H-pylori in Perforated Duodenal Ulcer

Frequency of H-pylori Stool Antigen in Patients with Perforated Duodenal Ulcer Disease

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ABSTRACT

Objective: To find the frequency of H-pylori stool antigen in patients with perforated duodenal ulcer disease.
Study Design: Descriptive / cross sectional study
Place and Duration of Study: This study was conducted at the Department of General Surgery, Nishtar Hospital Multan from March 2016 to January 2017.
Materials and Methods: A total number of three hundred and seventy eight patients were enrolled. Data was analyzed with a statistical software SPSS version 23. All numerical variables were calculated as mean ± SD and categorical variables were calculated as frequency and percentages. Chi square test was applied to see the effect modification and p value ≤0.05 was accepted as significant.
Results: Total number patients included in this study were three hundred and seventy eight (378) in which 237(62.7%) were male with mean age 44.75 ± 8.46 and 141(37.3%) were females with mean age 44.89 ± 9.93. From these 378 patients,200 (52.9%) patients having H-Pylori antigen and in 178 (47.1%) patients H-Pylori antigen was absent.
Conclusion: It is concluded that patient with perforated duodenal ulcer are at high risk of Helicobacter pylori infection, so the case of perforated duodenal ulcer should be investigated more aggressively. Early diagnosis can save the patient from dangerous effects of H-pylori infection.
Key Words: H-Pylori, Stool antigen, perforated duodenal ulcer, Serological tests

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INTRODUCTION

Duodenal and gastric ulcer disease is strongly and closely related to Helicobacter pylori which is a spiral gram negative rod residing underneath the mucus layer adjacent to epithelial cells of gastric mucosa, leading to gastric mucosal inflammation with polymorphonuclear neutrophils and lymphocytes and inturn ulceration. Two genes Vac A and Cag A seem to play an important role in the mechanism of injury[1]. Different countries and population varies in the prevalence of H-pylori infection, being low in developed countries compared to developing countries[2,3].

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From its many predisposing factors, use of cigarettes and nonsteroidal anti-inflammatory drugs (NSAIDs) are more important. Presence or absence of mucosa protective substances in the diet is also a major controlling factor in the prevalence of H-pylori and also contribute to the geological changes in the prevalence of duodenal ulcerative disease[4,5] which are unrelated to the prevalence of H-pylori infection. Staple diets containing certain phospholipids and sterols are one of the known group included in these protective substances.[6]

Diagnostic methods to detect H-pylori are divided into invasive and non-invasive group. Serological tests like IgG or IgA titter against various antigens and stool antigen detection are included in non-invasive group while bacterial culture, histological examination of biopsy specimen with different stains, and assays for urease activity are invasive methods. Only few reports showing the association of H-pylori with perforated peptic ulcer were present in the last ten years of English literature. Gastric mucosal atrophy is associated with high prevalence of H-pylori. Natural history of duodenal ulcer disease could be notably revised by eradicating the H-pylori infection. After eradication therapy nil or low recurrence of ulcer at the end of one year is observed in contrast to natural recurrence of

70%[7]. Therefore, in patients of duodenal ulcer disease eradication therapy of H-pylori is recommended[8]. This treatment has proven efficacy and effectiveness in H-pylori positive peptic ulcer disease[9]. In developing countries, this goal has a proven difficulty with a very high reinfection rate which could be attributed to either recrudescence or reinfection. But, the successful therapy almost annihilates the recurrence of duodenal ulcer. Reasons for low efficacy of triple therapy regime could be narrowed down to improper selection of drugs, low compliance and antimicrobial resistance[15]. ELISA for antibodies against H-Pylori was shown to be positive in 56.46 % of Patients Presented with Perforated Peptic Ulcer in a study conducted at Asad U et al[10].

This study is planned to provide basis literature on the frequency of H-pylori in perforated duodenal ulcer in local area leading to an opportunity of better investigation and proper treatment.

MATERIALS AND METHODS

This cross sectional descriptive study was conducted in the department of general surgery Nishtar hospital Multan from March 2016 to January 2017. Sample size of 378 patients was calculated with formula $n=Z^2(pq)/d^2$ (P =56.46 [16], Margin of error= 5%, Confidence interval = 95%). After giving complete information to the patients and their guardians about participation in the study a written consent was taken. Patient's contact numbers were taken to ensure follow up. Risks and benefits of treatment were discussed with patients/parents. Study was conducted after approval from ethical committee of the institution. All patients were operated by single consultant surgeon with post fellowship experience of 4 years and with same technique. Follow up was done by researcher, who is kept blind about the study to minimize bias. The first stool passed by the patient was collected and send for testing of H-pylori antigen to laboratory. Patients with history of taking acid reducing drugs (H receptor antagonist or PPI) in the last six weeks, any history of septicemia, failure of respiratory system, heart disease, known history of diabetes and who were taking steroid for some other illnesses, or immune suppressor drugs were excluded from the study.H-Pylori Antigen was considered present or absent on the basis of Stool testing for H-pylori antigen.Duodenal Ulcer was diagnosed on clinical examination epigastric pain and radiologicaly (on X-Ray abdomen + chest) under diaphragm.

The collected data entered and canvassed by using statistical software SPSS version 23. Mean ± standard deviations were calculated for quantitative variables like age and perforated duodenal ulcer. Frequency and percentage were calculated for catagorical variables like gender and presence of H-Pylori antigen, chi square test was applied. Effect modifier like age, duration of perforated duodenal ulcer and gender were controlled by stratification of data. Post stratification chi square test was applied to see the effect modification. A pvalue ≤0.05 was accepted as significant.

RESULTS

Total number patients included in this study were three hundred and seventy eight (378) in which 237(62.7%) were male with mean age 44.75 ± 8.46 and 141(37.3%) were females with mean age 44.89 ± 9.93. From these 237 patients, 200 (52.9%) patients having H-Pylori antigen and 178 (47.1%) patients were not having H-Pylori antigen. Total number of patients were divided into two age groups, patients from 30-45 years of age included in group 1, and age 46-60 years patients included in group 2 (table-1).

There were 217 patients from 30-45 years of age included in age group 1, in which 144 (66.4%) were males and 73 (33.6%) were females. From those 217 patients, 105 (48.4%) patients having H-Pylori antigen and 112 (51.6%) patients were not.

Table No.1: Demographics and Frequency of H-Pylori

Gender	**Age Mean ± SD**	**Duration of perforated duodenal ulcer Mean ± SD**
Male	44.75 ± 8.460	10.41 ± 6.645
Female	44.89 ± 9.931	10.87 ± 6.775
Frequencies (Percentage %)		
	Frequency	Percent (%)
Male	237	62.7 %
Female	141	37.3 %
H-Pylori Antigen On Stool Test		
Present	200	52.9 %
Absent	178	47.1 %
Duration of Perforated Ulcer		
1-12 hours	255	67.5
13-24 hours	123	32.5

Table No.2: Inferential Results

Gender	**H-Pylori Antigen On Stool Test**		**P Value**
	Present	**Absent**	
Male	116	121	0.045
Female	84	57	
Age groups			
30-45 years	105	112	0.041
46-60 years	95	66	
BMI groups			
20-27 kg/cm	92	65	0.061
28-35 kg/cm	108	113	

There were 161 patients included in age group 2 (46-60 years), in which 93 (57.8%) were males and 68 (42.2%) were females. From these 161 patients, 95(59%)

patients having H-Pylori antigen and 66 (41%) patients were not having H-Pylori antigen (table-1).

When Chi-Square was applied to check the association, it was noted that test H-Pylori antigen associated with age, gender and duration of Perforated Ulcer p values were 0.041, 0.045 and 0.05 respectively (Table-2,3,4).(Standard P-value was 0.05).

DISCUSSION

H-pylori prevalence in perforated duodenal ulcer disease was found to be 52.9% by stool antigen detection test. Other studies performed in the developing world show high prevalence compared to our study[11]. Diversity of age, health condition, living standard, study population, geographic regions, the analytical methods, the type of test specimens (stool and blood), and target molecules are the various factors which might have influenced the study results and led to difference in study findings. When compared with the studies of other developing countries, lower prevalence of H-pylori in current study was mainly attributed to the current study population of above 18 years of age.

Studies done by Newton et al[12], Jackman et al[13], Brandi et al[14], and Hestvik et al[15] are in favor of this concept. The prolonged persistence of antibodies even after the elimination of infection is likely to give different results in the same study population depending upon the selection of test which selectively detects either antigen or antibody. On the other hand, if a person is tested positive for antigen detection test but negative with antibody detection test might convey the idea of suffering from recent infection even before the development of detectable immune response. Cross reaction of normal intestinal microflora with H-*pylori* could also be the cause of false-positive results. The concept of inhabiting GIT bacteria which could lead to false positive test results of H-pylori in peptic ulcer patients was also observed in a European study[16]. The fact that previously infected adults who remained asymptomatic in their subclinical course of disease will test positive by the antibody-detection tests and negative by the antigen-detection tests was brought to light by a study of Triantafyllopoulou et al.[17] That's why; the stool antigen detection test can be used preferentially to detect active infection or carrier persons.

In current study, H. pylori prevalence among the age group 1 (30-45 years) was 48.4% compared to the prevalence of 59% in age group 2 (46-60 years). This trend was similar to the results of a study by Kang et al[18], in which seroprevalence of H. pylori kept on increasing with age in Indians, Malay and Chinese. Early colonization by H. pylori in less than-21-year population can lead to positivity of both antigen and antibody tests in that age group as narrated in a study done by Hestvik et al.[15]

In our study, out of all patients who had positive H. pylori antigen detection test 58% were males and 42% were females. Our findings confirm that a male adult of low socioeconomic status living with a partner should be considered as high risk person for H. pylori infection. Similar findings were narrated by a study done by Moayyedi et al.[19]

Possible predisposing factors to this infection were examined in our study. Though ELISA method was used to determine the significance of these predisposing factors but no considerable difference between the uses of two methods for this purpose was found. Lack of formal education, cigarette smoking and poor sanitation were found to be the significant predisposing factors to H. pylori infection with a p-value of <5%. These findings do notcorrelate with the study done at Ogihara et al[20], in which cigarette consumption per day was related inversely to the H. pylori seropositivity. The fact stating that there is no considerable and statistically significant relation between cigarette smoking and H. pylori prevalence, was proved by the study of Khalifa et al.[21] leaving us with poor living conditions as the most likely risk factor. This risk factor has appeared consistent in similar studies from all over the world. Environmental, genetic, poor community water supply and occupational exposure were the factors to be blamed for the acquisition of H. pylori in the study of Tanih NF et al[22]. Gastritis, peptic ulcers, and intestinal perforation were the reported disease manifestation in H. pylori positive tested patients. Epigastric pain, burning abdominal pain sensation, bloody stool, acute abdomen and rarely heametimesis are the presentation for these diseases. All the collected data reveal no significant association of this infection with any specific symptom[23].

CONCLUSION

It is concluded that patient with perforated duodenal ulcer are at high risk of Helicobacter pylori infection, so the case of perforated duodenal ulcer should be investigated more aggressively. Early diagnosis can save the patient from dangerous effects of H-pylori infection.

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Salama NR, Hartung ML, Müller A. Life in the human stomach: persistence strategies of the bacterial pathogen Helicobacter pylori. Nature Reviews Microbiol 2013;11(6):385-99.
2. Tovey FI. Role of dietary phospholipids and phytosterols in protection against peptic ulceration as shown by experiments on rats. World J Gastroenterol WJG 2015;21(5):1377.

3. Tovey F, Bardhan K, Hobsley M. Dietary phosphilipids and sterols protective against peptic ulceration. Phytotherapy Research 2013;27(9): 1265-9.
4. Eusebi LH, Zagari RM, Bazzoli F. Epidemiology of Helicobacter pylori infection. Helicobacter 2014;19(s1):1-5.
5. Zaki MES, Elewa A, Ali MA, Shehta A. Study of Virulence Genes Cag A and Vac A in Helicobacter pylori Isolated from Mansoura University Hospital Patients by Multiplex PCR. Int J Curr Microbiol App Sci 2016;5(2):154-60.
6. Tovey FI, Capanoglu D, Langley GJ, Herniman JM, Bor S, Ozutemiz O, et al. Dietary phytosterols protective against peptic ulceration. Gastroenterol Res 2011;4(4):149.
7. Graham DY, Lew GM, Evans DG, Evans DJ, Klein PD. Effect of triple therapy (antibiotics plus bismuth) on duodenal ulcer healing: a randomized controlled trial. Annals Int Med 1991;115(4): 266-9.
8. Molina-Infante J, Lucendo A, Angueira T, Rodriguez-Tellez M, Perez-Aisa A, Balboa A, et al. Optimised empiric triple and concomitant therapy for Helicobacter pylori eradication in clinical practice: the OPTRICON study. Alimentary pharmacol therapeutics 2015;41(6): 581-9.
9. Kim SG, Jung H-K, Lee HL, Jang JY, Lee H, Kim CG, et al. Guidelines for the Diagnosis and Treatment of Helicobacter pylori Infection in Korea. Korean J Gastroenterol 2013;62(1):3-26.
10. Chey WD, Wong BC. American College of Gastroenterology guideline on the management of Helicobacter pylori infection. Am J Gastroenterol 2007;102(8):1808-25.
11. Tsongo L, Nakavuma J, Mugasa C, Kamalha E. Helicobacter pylori among patients with symptoms of gastroduodenal ulcer disease in rural Uganda. Infect Ecol Epidemiol 2015;5.
12. Newton R, Ziegler JL, Casabonne D, Carpenter L, Gold BD, Owens M, et al. Helicobacter pylori and cancer among adults in Uganda. Infectious agents and Cancer 2006;1(1):5.
13. Jackman R, Schlichting C, Carr W, Dubois A. Prevalence of Helicobacter pylori in United States Navy submarine crews. Epidemiol Infect 2006; 134(03):460-4.
14. Brandi G, Biavati B, Calabrese C, Granata M, Nannetti A, Mattarelli P, et al. Urease-positive bacteria other than Helicobacter pylori in human gastric juice and mucosa. Am J Gastroenterol 2006;101(8):1756-61.
15. Hestvik E, Tylleskar T, Kaddu-Mulindwa DH, Ndeezi G, Grahnquist L, Olafsdottir E, et al. Helicobacter pylori in apparently healthy children aged 0-12 years in urban Kampala, Uganda: a community-based cross sectional survey. BMC Gastroenterol 2010;10(1):62.
16. Mégraud F, Lehours P. Helicobacter pylori detection and antimicrobial susceptibility testing. Clinical Microbiol Reviews 2007;20(2):280-322.
17. Triantafyllopoulou M, Whitington PF, Melin-Aldana H, Benya EC, Brickman W. Hepatic adenoma in an adolescent with elevated androgen levels. J Pediatric Gastroenterol Nutrition 2007; 44(5):640-2.
18. Kang J, Yeoh K, Ho K, Guan R, Lim T, Quak S, et al. Racial differences in Helicobacter pylori seroprevalence in Singapore: correlation with differences in peptic ulcer frequency. J Gastroenterol Hepatol 1997;12(9-10):655-9.
19. Moayyedi P, Deeks J, Talley NJ, Delaney B, Forman D. An update of the Cochrane systematic review of Helicobacter pylori eradication therapy in nonulcer dyspepsia: resolving the discrepancy between systematic reviews. Am J Gastroenterol 2003;98(12):2621-6.
20. Ogihara A, Kikuchi S, Hasegawa A, Kurosawa M, Miki K, Kaneko E, et al. Relationship between Helicobacter pylori infection and smoking and drinking habits. J Gastroenterol Hepatol 2000; 15(3):271-6.
21. Khalifa MAAA, Almaksoud AA. Cigarette smoking status and Helicobacter pylori infection in non-ulcer dyspepsia patients. Egypt J Chest Dis Tuberculosis 2014;63(3):695-9.
22. Tanih NF. Molecular and phenotypic characterization of Helicobacter pylori isolates from patients with gastroduodenal pathologies in the Eastern Cape Province of South Africa: University of Fort Hare; 2011.
23. Forouzanfar MH, Alexander L, Anderson HR, Bachman VF, Biryukov S, Brauer M, et al. Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. The Lancet 2015;386(10010):2287-323.