

ORIGINAL ARTICLE

ASSOCIATION OF H. PYLORI INFECTION WITH GASTRODUODENAL DISEASE: A CROSS SECTIONAL STUDY FROM MYSURU, INDIA

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ABSTRACT

Introduction: In developing countries like India, Helicobacter pylori related gastritis is a major health ailment. This study was aimed to explore the prevalence of H. pylori infection in patients undergoing upper gastrointestinal endoscopy and its association with the various gastroduodenal diseases.

Methods: This study cross sectional includes 158 patients both male and females patients attending Gastroenterology OPD at JSS Hospital, Mysuru with symptoms suggestive of gastro duodenal diseases. They were subjected to upper gastrointestinal endoscopy and investigated for H. pylori infection through histopathological examination. Data analysis was carried out using SPSS for Windows version 16.0.

Results: Prevalence of H. pylori was more in male (78%) population compared to females (66%). Majority of the patients 97 (61.6%) out of 158 were in the age group of 31-60 yrs. Majority of H-pylori positive patients were found to be having H-pylori density 1+ (44.9%). Majority of patients was diagnosed to have duodenal ulcer (25.3%), gastric ulcer (21.5%) and gastric erosions (17.7%).

Conclusion: From this study, we concluded that age related prevalence is more in relatively younger age group than elderly and prevalence is more in males. We also noticed that associations of H-pylori infection with gastric erosions and duodenal ulcers were statistically significant.

Key words: Helicobacter pylori infection, Histopathological examination, Gastroduodenal diseases, gastritis

INTRODUCTION

Helicobacter pylori (H. pylori) is a spiral, Gram-negative bacterium that chronically infects more than half of the world's population, and is currently recognized to play a causative role in the pathogenesis of gastritis, gastroduodenal ulcer, gastric adenocarcinoma and mucosa-associated lymphoid tissue (MALT) lymphoma.^{1,2} Chronic gastritis and peptic ulceration are prevalent in a high magnitude throughout the world.³ Helicobacter pylori gastritis is the principal cause of chronic active gastritis and has major complications like gastric adenocarcinoma and mucosa associated lymphoid tissue lymphoma.⁴ H. pylori is a gram negative flagellated bacillus that usually colonizes gastric pits under the mucus layer and in close association to gastric epithelial cells. Approximately, 50% of the normal population across the world harbor H. pylori, though only 10-20% of them become symptomatic.^{5,6}

There is an association of H. pylori infection with the hygiene related conditions, life-style, and economy with annual an incidence rate of H. pylori infection \approx 4-5% in developing nations compared to that of \approx 0.5% in developed and industrialized countries.⁷

There is a high prevalence of H. pylori infection in developing countries with up to 80% of the children under the age of 10 years are infected. In India, the prevalence of this infection is 22%, 56%, and 87% in the 0-4 years, 5-9 years and in the 10-19 years age group respectively.⁸ There are many other etiological factors such as smoking, non-steroidal anti-inflammatory drugs (NSAIDS), and reflux of gastric juice (chemical gastritis) that are also implicated to cause chronic gastritis. H. pylori, though is regarded as the primary cause of gastritis, it can act as a synergist in addition with other etiological factors.⁹

Though, many studies have already been conducted in the past on the current topic, still there is a paucity of information about H. pylori infection prevalence in this part of Southern India. The present study was undertaken to estimate the prevalence of H. pylori infection among patients presenting with the dyspepsia and compute its association with gastroduodenal lesions in Mysuru, Karnataka, India.

METHODS

The present study was cross sectional in nature. It includes one hundred and fifty eight (158) patients both male and females patients attending Gastroenterology OPD at JSS Hospital, Mysuru with symptoms suggestive of gastro duodenal diseases. The study period was conducted during August 2014 to January 2016. A total of 158 consecutive adult patients who presented to JSS Hospital, Mysuru with symptoms of gastro-duodenal diseases and referred for upper gastrointestinal endoscopy from August 2014 to January 2016 were enrolled in the study.

Patients below 15 years, pregnant and lactating women., patients on proton pump inhibitors., patients on NSAIDs for more than 1 month., patients who have recently received anti H. Pylori treatment, patients who are known case of bleeding disorders., patients with present or past history of gastric surgery and patients unwilling or unfit for gastroscopy were excluded from the study. Approval from institutional ethical committee was taken before commencement of study. Written consent was taken from all the patients.

Endoscopy was carried out using the "Olympus GIF 150" esophago-gastro-duodenoscope. The patients were taken for upper gastrointestinal endoscopy after making them fast overnight. The endoscopy was considered normal on visualizing mucosa, which is pink in colour, smooth, and lustrous. Two endoscopic biopsy fragments were obtained from each patient from the gastric mucosa which were sent for histopathology. Histopathological assessment of gastric mucosa was carried out by a pathologist and grading was carried out for mononuclear cell infiltration, neutrophilic infiltration, atrophy, intestinal metaplasia and density of H. pylori according to the visual analogue of updated Sydney grading system for reporting gastric biopsies. Microscopic assessment of slides was carried out using labomed microscope vision 2000, India. In positive cases, H. pylori appeared as light bluish rods in H and E stained slides with varying sizes (3-6 μ) on the luminal surface of mucosal cells. In Giemsa stain, H. pylori appeared dark blue in a light background.

Presence of H. pylori in association with different gastro-duodenal pathologies like gastritis, gastric ulcer, duodenal ulcer and gastric carcinomas were assessed.

Table 3: Association of H-pylori with various Gastro-duodenal diseases

Analysis was done using the statistical package for social sciences, for Windows version 16.0 (SPSS 16; Chicago, IL, USA). Categorical variables were compared with Chi-square test. $P < 0.05$ was taken as statistically significant.

RESULTS

Out of 158 patients, 105 (66.7%) were males and 53(33.3%) were females. Prevalence of H. pylori was more in male (78%) population compared to females (66%). In this study, the majority of the patients 97 (61.6%) out of 158 were in the age group of 31-60 yrs. only 22 (14.1%) patients were <30 years, and 39 (24.4%) patients were above 60 yrs. In our study population age related prevalence of H. pylori is more in relatively younger age group than elder population (i.e. prevalence is 85% in age group 31-40 yrs compared to prevalence of 65% in population >61 years). (Table 1)

In our study out of 158 study subjects, 41 were found to be negative for H. pylori infection. Majority of H-pylori positive patients were found to be having H-pylori density 1+ (44.9%). (Table 2)

Among the study subjects, 10.8% were found to be having normal Upper GIscopy in spite of symptoms suggestive of gastro-duodenal diseases, majority of patients was diagnosed to have Duodenal ulcer (25.3%), Gastric ulcer (21.5%), and gastric erosions (17.7%). As shown in Table 3, presence of H. pylori infection was significantly associated with duodenal ulcer and gastric erosions (p value <0.05).

Table 1: Distribution of patients according to H. pylori biopsy results

Variable	H. pylori status		Total
	Positive N=117 (%)	Negative N=41 (%)	
Age groups (yrs)			
<30	4 (18.2)	18 (81.8)	22
31-40	5 (14.3)	30 (85.7)	35
41-50	10 (32.3)	21 (67.7)	31
51-60	8 (25.8)	23 (74.2)	31
>61	14 (35.9)	25 (64.1)	39
Sex			
Male	23 (21.9)	82 (78.1)	105
Female	18 (34.0)	35 (66.0)	53

Table 2: H-pylori density in study subjects

H. pylori density	No. of patients	%
0	41	26
1+	71	44.9
2+	32	19.6
3+	14	8.9

Diagnosis	H. pylori status		Total	P value
	Positive (n=117) (%)	Negative (n=41) (%)		
Normal	9 (50.0)	9 (50.0)	18	
Gastric Cancer	10 (55.6)	8 (44.4)	5	0.7
Duodenal ulcer	32 (80.0)	8 (20.0)	28	0.02
Gastric ulcer	24 (67.6)	10 (32.4)	3	0.23
Gastroduodenal Ulcer	7 (67.6)	1 (12.5)	4	0.07
Gastric erosion	24 (85.7)	4 (14.3)	34	0.009
Gastroduodenal erosion	4 (100.0)	0 (0.0)	40	0.1
Duodenal erosion	2 (66.7)	1 (33.3)	8	0.9
GERD	5 (100.0)	0 (0.0)	18	0.1

DISCUSSION

The present study involved 158 patients with symptoms suggestive of gastro duodenal diseases who satisfied the inclusion and exclusion criteria.

In our study we included the study subjects between 20 to 78 years, majority of the patients were in 31 to 60 yrs. Gill et.al¹⁰ Indicated that in India exposure to H. pylori occurs early in life and is widespread, about 83% of the population is exposed to H. pylori during the first two decades of life. Similarly Tarkhashvili et al¹¹, Shokrzadeh et al¹², and Kaore et al¹³ reported increased H. pylori infection in age groups of 20-40 years than the older age group.

H-pylori infection is one of the most common infectious worldwide. In the present study the prevalence of H-pylori infection among the patients with gastro-duodenal diseases were 73.4% (116 out of 158) and the prevalence of H-pylori among the symptomatic patients with normal upper GI scopy was 50% (9 out of 18 among 158 patients), among Gastric erosions patients the prevalence was 85.7% (24 out of 28 among 158 patients), In duodenal erosive patients prevalence was 66.7% (2 out of 3 among 158 patients), in gastro-duodenal erosions patients prevalence was 100% (4 out of 4 among 158 patients), In gastric ulcer patients prevalence was 67.6% (23 out of 34 among 158 patients), in duodenal ulcer patients prevalence was 80% (32 out of 40 among 158 patients), in Gastro-Duodenal ulcer patients prevalence was 87.5% (7 out of 8 among 158 patients), in gastric-carcinomas patients prevalence was 55.6% (10 out of 18 among 158 patients). According to Murali et.al the prevalence of H. pylori infection with duodenal ulcers varies from 64 to 90%. The frequency of positivity in Indian patients with gastric ulcer varies from 50 to 65%.

In our study, We also noticed higher prevalence of H. pylori infection in duodenal ulcer (80%) and gastric ulcers (67.6%). The reason for duodenal ulcers in H. pylori infection is, H. pylori infection blocks normal physiological inhibitory mechanisms from the antrum to both gastrin cells and to parietal cell region, resulting in increased gastrin release and impaired inhibition of gastric acid secretion, which will probably lead to an increased duodenal acid load as a general prerequisite for the development of duodenal ulcer disease¹⁴.

The primary pathological mechanism of gastric ulcer in H. pylori infection is mainly due to altered gastric mucosal defence. In our study we also noticed higher prevalence of H. pylori infection in gastric erosions, GERD and gastro-duodenal erosions. H. pylori eradication had no impact on esophageal acid exposure or LES (lower esophageal sphincter) pressure¹⁵. H. pylori eradication resulted in no consistent change in gastroesophageal acid reflux¹⁶. No differences were detected in acid reflux before and after H. pylori eradication¹⁷. Eradicating H. pylori increases esophageal acid exposure and in some cases, worsened reflux symptoms¹⁸.

CONCLUSION

From our study, we would like to conclude that age related prevalence is more in relatively younger age group than elderly and prevalence is more in males. Among the gastro duodenal diseases the prevalence of H. pylori infection is high in duodenal ulcers followed by gastric ulcer. We also noticed that associations of H-pylori infection with gastric erosions and duodenal ulcers were statistically significant.

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