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Original Research Article

A prospective study of proportion of *Helicobacter pylori* infection in patients presenting with dyspeptic symptoms in S. Nijalingappa Medical College and H.S.K. Hospital, Bagalkot

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ABSTRACT

Background: More than half of the world's population is infected with *Helicobacter pylori*, the primary cause of chronic gastritis. Chronic gastritis is associated with peptic ulcer and in advanced stages with an increased risk of developing gastric adenocarcinoma. The aim of the study was to determine the prevalence of *Helicobacter pylori* infection in dyspeptic patients and its relationship with gastroduodenal pathologies using gastric biopsy histology.
Methods: A cross sectional prospective study was conducted from 1st January 2018 to 30th June 2019. It included out-patients and in-patients, presenting with dyspeptic symptoms and undergoing upper GI Endoscopy, at S. Nijalingappa Medical College and HSK hospital, Bagalkot, Karnataka, India. Endoscopic impressions were noted. In case of any abnormal findings on upper gastrointestinal endoscopy, endoscopic biopsy was obtained. Histopathological assessment of gastric mucosa was done after staining with H and E stain and Giemsa stain. The histopathological diagnosis of *Helicobacter pylori* infection in biopsy specimen will be mainly done using the Modified Giemsa stain.
Results: 105 patients with dyspepsia were studied in total. Out of which, 44 patients (41.9%) were detected positive for *Helicobacter pylori* infection.
Conclusions: The burden of *Helicobacter pylori* infection in patients with dyspepsia was high. Early diagnosis and eradication of *Helicobacter pylori* not only improves symptoms but also help to prevent complications associated with *Helicobacter pylori* infections.

Keywords: Dyspepsia, Endoscopy, Gastritis, Giemsa, *Helicobacter pylori*

INTRODUCTION

Dyspepsia is a constellation of upper gastrointestinal symptoms that occurs mainly in adults.[1] *Helicobacter pylori* is a gram negative microaerophilic bacterium causing inflammation of the stomach, first isolated by Barry Marshall and Robin Warren in 1982.[2,3] It is one of the most common cause of human infections worldwide; approx. 50% of the world's population is infected with *H. pylori*.[4] A wide range of noninvasive and invasive laboratory investigations are available for diagnosis of *H. pylori*. Noninvasive tests include urea breath test, serological immunoglobulin G and immunoglobulin M detection, saliva and urinary antibody test, and stool antigen test.[5] The invasive tests are endoscopy-based tests, which include histopathological examination, rapid urease test (RUT) and polymerase chain reaction.[5]

Approximately 80% of the population may be infected by the age of 20. In India, the prevalence of this infection is 22%, 56%, and 87% in the 0-4 years, 5-9 years, and 10-19 years age group, respectively.[6]

It is a principal etiologic agent of the majority of upper gastrointestinal (UGI) diseases, associated with significant morbidity.[3] *H. pylori* gastritis is the principal cause of chronic active gastritis and has major complications such as gastric adenocarcinoma and mucosa associated lymphoid tissue lymphoma.[4]

H. pylori infection is an easily preventable cause of an array of pathological upper gastrointestinal conditions causing dyspeptic symptoms, including gastric adenocarcinoma. Hence it is important to assess its prevalence and work towards its eradication. Incorrect or delayed diagnosis, and subsequent ineffective management, results in increased morbidity, development of malignancy like adenocarcinoma. This puts enormous burden on the cost and treatment of the patient.[7]

Hence, the need for this study was to identify, by early diagnosis of *H. pylori* infected people and to provide effective treatment to prevent complications and also to know exact prevalence of *H. pylori* in this part of North Karnataka.

Objectives of the study was to estimate the proportion of *H. pylori* infection among adult patients presenting with dyspepsia in S. Nijalingappa Medical College and H.S.K. Hospital, Bagalkot. And to analyze the association of *H. pylori* infection with different Upper gastrointestinal lesions.

METHODS

The study was conducted with out-patients and in-patients, presenting with dyspeptic symptoms and undergoing upper GI Endoscopy, after taking informed consent from each patient, at S. Nijalingappa Medical College and HSK hospital, Bagalkot, Karnataka, India, during the period of January 2018 to June 2019.

The study conducted is a hospital-based cross-sectional prospective study. The patients were selected on the basis of chief complaints of dyspepsia and the age of patients above 18 years. The HSK hospital serves as a reference centre for rural and suburban population of Bagalkot district of North Karnataka, India.

Inclusion criteria

OPD and IPD patients of S. Nijalingappa Medical College and HSK Hospital, presenting with symptoms of dyspepsia. Dyspepsia symptoms included one or more of the following symptoms; postprandial fullness (termed postprandial distress syndrome); early satiation and Epigastric pain or burning epigastric pain (termed epigastric pain syndrome).[2] Patients with age 18 years and above. Patients who have signed written informed consent. Exclusion criteria for the study group. Patients on any antibiotic therapy within last 1 month of upper GI endoscopy. Patients who have taken *H. pylori* eradication treatment in the past. Sample size was calculated to be 100.

Endoscopisc evaluation was carried out using esophago gastro endoscopic following standard procedures. The patients were taken for upper gastrointestinal endoscopy after making them fast overnight. All anatomic regions of the esophagus, stomach, first and second parts of the duodenum whenever possible were examined and endoscopic impressions were noted. The endoscopy was considered normal on visualizing mucosa, which was pink in color, smooth, and lustrous. In case of any deviation from normal findings on endoscopy, one endoscopic biopsy fragment was obtained using an endoscopy biopsy forcep from such a patient from the antrum or pathological part. The biopsy fragment was sent to histopathology department in formalin container. Two sections of 4 µ thickness were cut from each block and were mounted on two slides, one each on a slide. Slides were stained with normal H and E, stain and Giemsa stain. Histopathological assessment of gastric mucosa was carried out by a pathologist. In Giemsa stain, *H. pylori* appears dark blue in a light background.

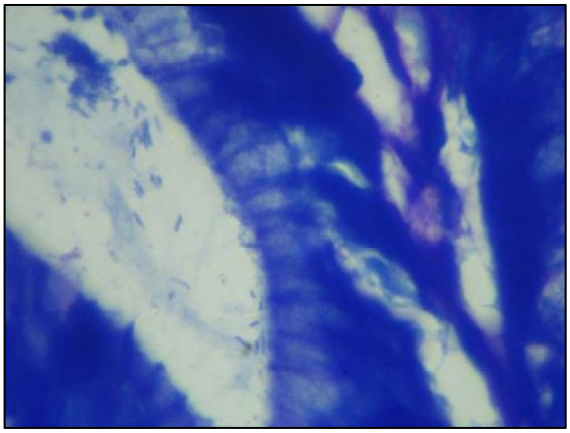

Figure 1: Histopathological slide photo of Giemsa stained *H. pylori* bacilli.

Statistical analysis

The data was analyzed with SPSS software. Chi-square test for qualitative data and student‘t’ test for quantitative data was applied. Other appropriate statistical test was applied for the data collected.

RESULTS

The present study was conducted in S. Nijalingappa medical college and HSK Hospital, Bagalkot; on 105 consecutive patients presenting with dyspepsia, for whom endoscopic gastric mucosal biopsies were taken and histopathological analysis for *H. pylori* infection was done. The various observations made in this study and the inferences made on their basis are summarized below.

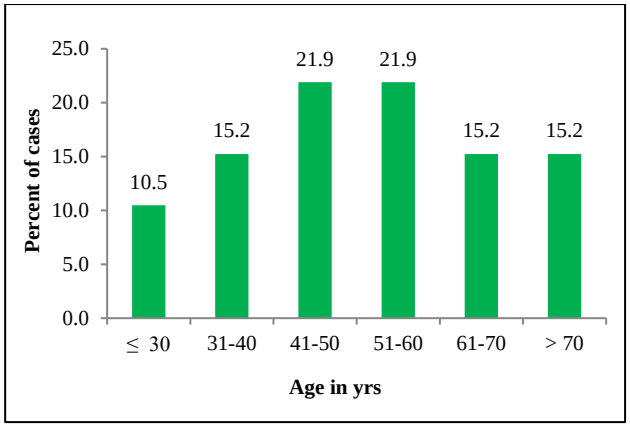

Figure 2: Age distribution of the patients studied.

The age of the patients ranged from 19 to 92 years, the mean being 52.18±16.14 years. The highest number of patients belonged to the age group of 41-50 and 51-60 (n=23, 21.9%) (Figure 2). But the prevalence of *H. pylori* infection among these cases peaked in the 6th decade. Table 1 shows the gender-wise distribution of patients with *H. pylori* infection.

Table 1: Gender-wise distribution of patients with *H. pylori* infection.

Gender	*H. pylori* infection		Total
	Yes	No	
Male	27	38	65
Female	17	23	40
Total	44	61	105

Chi square test; p<0.923, not significant

The most common chief complaint in this study was found to be epigastric pain, constituting 67.6% (n=71) of all patients (Figure 3).

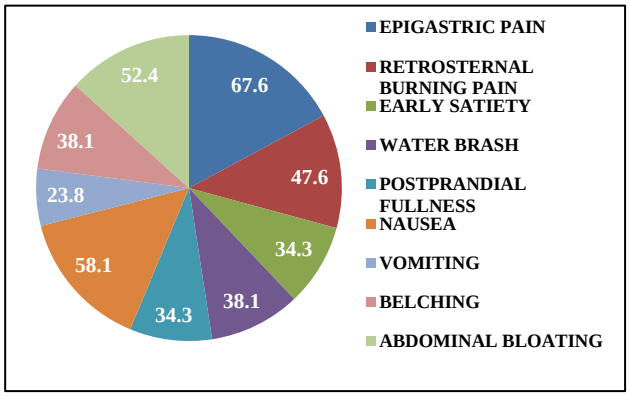

Figure 3: Complaints of the patients studied.

The most common endoscopic finding was found to be Gastritis (83.8%). 9.5% patients showed features of carcinoma stomach on endoscopy (Figure 4). Majority of patients (61.9%, n=65) had lesions in the gastric antrum on UGI endoscopy, followed by gastric fundus, in this study. The least common site of lesions was found to be the gastro-esophageal junction (5.7%, n=6).

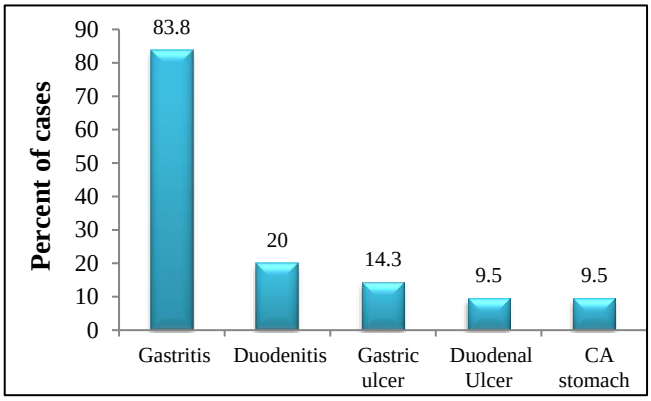

Figure 4: Endoscopic findings of patients studied.

After the upper gastrointestinal endoscopic biopsy, the histopathological analysis of the biopsy specimen was done. 84 patients out of 105 patients (80%) showed benign changes on histopathological analysis. In this study, 9.5% patients (n=10) showed malignant changes on histopathological analysis.

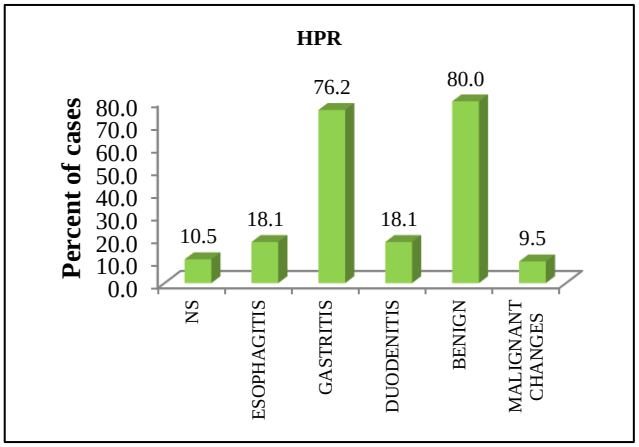

Figure 5: Diagnosis on histopathological examination in patients studied.

44 patients out of 105 i.e. 41.9% patients showed presence of *H. pylori* infection on histopathological examination with H and E stain and giemsa stain.

Out of the 44 patients diagnosed positive for *H. pylori* infection, majority of them showed features suggestive of gastritis on upper gastrointestinal endoscopy. In this study, endoscopic diagnosis of gastritis and duodenal ulcers showed statistically significant association with *H. pylori* infection.

On histopathological examination, it was seen that both benign and malignant pathologies in patients with dyspepsia were statistically significantly associated with *H. pylori* infection.

Table 2: Association of endoscopic findings with *H. pylori* infection.

Endoscopic findings	*H. pylori* infection		Chi square test	
	Yes (n=44)	No (n=61)	P value	Significance
Gastritis	41	47	0.02	S
Duodenitis	10	11	0.553	NS
Gastric ulcer	6	9	0.872	NS
Duodenal ulcer	7	3	0.05	S
CA stomach	3	7	0.326	NS

NS=not significant; S=significant.

Table 3: Association between the histopathological diagnosis and *H. pylori* infection.

HPR	*H. pylori* infection		Chi square test	
	Yes (n=44)	No (n=6)	P value	Significance
NS	0	11	0.01	S
Benign	40	44		
Malignant changes	4	6		

S=significant.

DISCUSSION

Gastritis, gastric ulceration, and gastric malignancies have many etiological factors, among which *H. pylori* infection is the principal cause. *H. pylori* infection is dependent upon many variables such as age, sex, socioeconomic status, dietary habits, genetic, and immunological factors. The present study conducted at S. Nijalingappa Medical College and HSK Hospital, Bagalkot was a prospective study. It aimed at establishing the proportion of *H. pylori* infection in patients presenting with dyspepsia in this hospital. The results of this study have also been compared with other studies done previously.

In this study, the age of the patients with dyspepsia ranged from 19 to 92 years, with the peak incidence seen in the fifth (21.9%) and sixth (21.9%) decade. The least number of cases were seen in the patients less than 30 years of age. This was in concordance with Siurala et al who reported that prevalence rate of gastritis increased significantly with age.[9]

Male preponderance was seen in the present study, with male to female ratio of patients presenting with dyspepsia being 1.6:1. This was comparable with the study conducted by Oling et al where F:M ratio was 1:1.4.[3] It was also in line with the male preponderance seen in the study by Agarwal et al.[4] However, contrary to our study, in the study conducted by Olokoba et al, male to female ratio was 1:1.6.[2]

In this study, the most common presenting symptom was found to be epigastric pain as 67.6% patients had it as their chief complaint. Similar findings were noted in the studies conducted by Oling et al, Agarwal et al and Adlekha et al where the most common presenting complaint was epigastric pain or upper abdominal pain.[3,4,10]

In the present study, all the 105 patients were found to have organic dyspepsia. The most common identifiable lesion at endoscopy in this study was gastritis which had a frequency of 83.8%, which was followed by duodenitis (20%). Serious gastrointestinal pathologies like gastric ulcers (14.3%), duodenal ulcers (9.5%) and carcinoma stomach (9.5%) characterised by ulceroproliferative lesions, were also noted on endoscopy.

Similar to this study, gastritis was found to be the commonest endoscopic finding in the studies conducted by Oling et al (74%), Adlekha et al (69%) and Jemilohun et al (60.5%).[3,10,11] Next commonest endoscopic lesion was duodenitis in all these studies and the frequency of ulcerative diseases and carcinoma stomach was low, as seen in the present study.[3,10,11] The difference in the frequency of each upper gastrointestinal pathology in these studies as compared to the present one, could be due to the presence of other risk factors responsible for the acid peptic diseases in varying degrees in the varied populations analysed and compared in the above studies.

However, our findings differ from the findings of the study done by Agarwal et al where the most common endoscopic abnormality was duodenal ulcer (53.7%) followed by chronic gastritis.[4] This could be explained by the fact that only the patients above 50 years age and those with alarming symptoms underwent UGI endoscopy in that study. In the present study, 41.9% patients showed presence of *H. pylori* infection on histopathological examination with H and E stain and Giemsa stain. In the study conducted by Oling et al in Kampala, Uganda; 36% participants had *H. pylori* at histopathology. This study was conducted in a low research setting and used only histology for detecting *H. pylori* organisms similar to our study.[3]

In another study by Niknam et al done in Shiraz in South Iran, 31% patients were positive for *H. pylori.* This study detected *H. pylori* infection by three methods that is by HPE, RUT and culture; and two positive results were considered as positive for *H. pylori.* The difference in the method of detection could be one of the reasons for the difference in the prevalence apart from the disparity in the socioeconomic and environmental factors.[12] These above studies mentioned are all conducted in different parts of the world and hence are exposed to different environmental conditions and risk factors. The high prevalence rates found for *H. pylori* infection among

dyspeptic patients by various investigators may be due to early acquisition of the organism, similarities in the age of the patients enrolled, similarities in geographical location, socio-cultural practices, environmental and living conditions. Bani et al in their work in Jordan demonstrated that environmental factors such as barometric pressure and seasonal temperature variation rather than genetic background play a role in the prevalence of *H. pylori* in different populations.[2]

However, even when results were compared to studies conducted in different parts of India, the results differed from our study probably due to the diversity in the lifestyle and socioeconomic conditions within the country. In a study conducted in Kerala, by Adlekha et al, where the *H. pylori* detection was by both HPE and RUT, the *H. pylori* prevalence rate was 62%. The variation in results could also be due to the disparity in method of detection.[10]

In another report from India, in 2007, Poddar et al demonstrated that almost 80% of the population in India was infected with *H. pylori*.[13] In 2007, Ahmed et al also showed that the overall prevalence of *H. pylori* in India was 80%.[14] *H. pylori* infection has been reported by several studies to be high in developing countries, and associated with low levels of education, low social economic status, and poor sanitation.[3] It is anticipated that the prevalence of *H. pylori* infection has declined due to improved sanitary conditions and wide spread use of antibiotics.[3]

In this study, the correlation between the various symptoms and prevalence of *H. pylori* infection showed that the association between epigastric pain and *H. pylori* infection was statistically significant (p=0.02). None of the other dyspeptic symptoms showed any statistically significant correlation. This result of our study can be especially useful in patients from rural areas where endoscopy or other methods of detection of *H. pylori* cannot be made available. In our study it was seen that the associations between gastritis as well as duodenal ulcer and *H. pylori* positive patients were statistically significant (p values of 0.02 and 0.05 respectively). This result was in concordance with the studies conducted by Agarwal et al and Kate et al.[4, 15] In this study, the benign and malignant pathologies on histopathological examination were statistically significantly associated with *H. pylori* infection (p=0.01). Similar results were observed in the study by Adlekha et al.[10]

CONCLUSION

In conclusion, there is a high prevalence of *H. pylori* infection in rural population of Bagalkot district of Karnataka, South India. Though, the prevalence of *H. pylori* gastritis and associated abdominal symptoms is high in number, serious gastrointestinal complications develop in few.

Prevention of these complications and relief from the distressing abdominal symptoms can be achieved through early detection by conventional and affordable diagnostic methods like endoscopy and biopsy and treatment with anti *H. pylori* therapy.

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Ethical approval: The study was approved by the Institutional EthicsCommittee

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