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Original Research Article

Helicobacter pylori among the cases of gastritis: a one year study at a tertiary care hospital of South India

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ABSTRACT

Background: Gastritis is one of the commonest clinical conditions encountered by a physician. The most common cause is said to be infection with *Helicobacter pylori*. The present study was aimed to diagnose the prevalence of *H. pylori* infection among the cases of gastritis and its correlation with histopathological findings and associated rapid urease test.
Methods: A one year prospective study at a tertiary care hospital was conducted and all cases of gastritis were included and socio demographic data, clinical complaints and duration were noted. Endoscopy was performed on all cases. Biopsy was performed histopathological examination with staining and graded by Houston-updated Sydney system. Rapid urease test was performed and findings noted.
Results: 325 cases with 215 male and 110 female cases were included. 26.15% were in age group of more than 60 years and number of cases increased with age. Mean age of study participants was 39.12±2.8 years and heart burn was the common complaint in the study cases. 81.54% of the cases revealed endoscopic gastritis on endoscopy and hyperaemia was commonest. 83.69% were positive by rapid urease test. Rapid urease test is more sensitive than histological staining in confirmation of *H. pylori* infection.
Conclusions: To conclude on the present study, the prevalence of *H. pylori* infection is on a global rise and appropriate measures to reduce the prevalence is quite an urgent necessity. Histopathological interpretation of gastric biopsies is a reliable indicator of *H. pylori* infection as well as gastritis grading according to the Sydney grading system.

Keywords: *Helicobacter pylori*, Gastritis, Rapid urease test, Endoscopy

INTRODUCTION

Gastritis is one of the commonest clinical conditions encountered by a physician. The incidence of gastritis around the world accounts to more than 50% with reasons being variable which may be because of bacterial infection, auto immune etc. In general, the most common cause is said to be infection with *Helicobacter pylori* a microaerophilic bacterial pathogen which is a resident of human gastric mucosa. It is said that about 50% of world's population is infected with the pathogen, and the incidence is more in developing countries than developed countries.[1] The prevalence of the pathogen is widely variable and is influenced by variable factors like geographic distribution, age, race and socio economic status. The acquisition of the pathogen is influenced various risk factors which include smoking, alcohol consumption, dietary habits, waterborne exposures, social factors and family history of gastric disease. Not only associated with gastritis the organism is also found to have strong association with gastric carcinoma and MALToma. The virulence factors, bacterial colonization

and immune response of the host determine the inflammatory response and histopathological characters on the biopsy.[2] Chronic infection with the pathogen causes severe mucosal injury leading to wide variety of histopathological changes which may include multifocal atrophic gastritis, intestinal metaplasia, glandular dysplasia and adenocarcinoma. On regular treatment and modification in dietary and lifestyle changes the histology of the lesions may improve and become normal. The diagnosis of *H. pylori* infection can be divided into endoscopic and non endoscopic tests. Serologic test for antibody indicates exposure to bacteria but does not help to assess active infection. However histological diagnosis combined with other test like culture, rapid urease test helps in accurate identification in confirmation of the diagnosis. The grading of histopathological findings will help the clinicians in developing an insight in to the type of gastritis associated.[3]

The present study was aimed to diagnose the prevalence of *H. pylori* infection among the cases of gastritis and its correlation with histopathological findings and associated rapid urease test.

METHODS

A prospective cross sectional study was conducted at Department of surgery in association with department of pathology at Narayana Medical College and Hospital a tertiary care hospital in south India. The study period was for twelve months from January 2017 to December 2017. All the patients attending the outpatient section with complaints suggestive of Gastritis (both acute and chronic) were enrolled in the present study. The study protocol was presented before the institutional ethical committee and was approved. The guidelines of the committee were clearly followed throughout the study period. The socio demographic data of the participants was collected by interviewing and entered in a predesigned questionnaire sheet prepared in local language. Age, sex, socio economic status, personal hygiene and history of risk factors like smoking, alcoholism were noted in the socio demographic data. A detailed history of duration of symptoms, complaints, history of medications, previous surgery of Gasto intestinal tract were noted by a senior most surgeon trained in history taking and systemic examination. All the cases who were enrolled and gave consent for the study with signs and symptoms of gastritis (Acute and chronic) were performed upper GI endoscopy and two samples of tissue for biopsy and rapid urease test was obtained from different sites based upon the localization of the ulcer.

One sample of biopsy of the tissue was processed for histopathological findings and other small bit was used for performance of rapid urease test (CLO test HP fast test kit). The tissue for histopathological examination was transported in 10% formalin for histopathology lab. The specimen was processed, embedded in paraffin, and cut and stained with haematoxylin and eosin (H&E) staining and geimsa staining. In our study, modified Sydney system of grading was employed. The biopsies were evaluated for the intensity of mononuclear inflammatory cellular infiltrates, inflammatory activity (neutrophilic infiltrations), glandular atrophy, metaplasia, reparative atypia, and dysplasia. Additionally, the cases were graded according to the Houston-updated Sydney system, which was graded according to the intensity of mononuclear inflammatory cellular infiltrates within the lamina propria: absent inflammation (Grade 0), mild inflammation (Grade 1), moderate inflammation (Grade 2), and severe inflammation (Grade 3).[4] The other specimen was performed rapid urease test which was commercially available and the positive result was observed as change in the colour of the medium from yellow to pink which indicates the presence of urease enzyme.

Statistical analysis

All the data collected was entered in Microsoft excel spread sheet and was corrected. The corrected data was entered in SPSS software (Ver 20) Chicago, USA. Chi-square test was used to determine the level of statistical significance. P value <0.05 was considered statistically significant.

RESULTS

In the present prospective study conducted for a period of one year a total of 325 cases fulfilling the inclusion criteria were enrolled. Males were predominant with 66.15% (215 cases) and females 33.85% (110 cases). Majority of the cases were in the age group of >60 years (26.15%) followed in order by 51-60 years (23.08%), 41-50 years (20.62%), 31-40 years (17.54%) and 21-30 years (12.62%) (Table 1). In our study it was observed the number of cases increased with progression of the age. The average age of the study participants was 39.12±2.8 years, mean age of male cases was 37.29±1.8 years and females was 38.24±2.0 years. The minimum and maximum age of study participants was 21 years and 82 years with an age range of 68 years.

Table 1: Age wise distribution of cases in the study.

Age group (years)	Male	Female	Total	%
21-30	24	17	41	12.62
31-40	38	19	57	17.54
41-50	46	21	67	20.62
51-60	52	23	75	23.08
>60	55	30	85	26.15
Total	215	110	325	100

Heart burn was the major complaint (75.38%) of the cases followed in order by dysphagia (65.85%),

abdominal pain (60.92%), discomfort with food (32%) and vomiting in 26.15% of the cases (Table 2). Smoking was reported in 38.5% and alcoholism in 46.5% of the cases.

Table 2: Symptoms of cases in the study.

Symptoms	N	%
Heart burn	245	75.38
Dysphagia	214	65.85
Abdominal pain	198	60.92
Vomiting	85	26.15
Abdominal discomfort with food	104	32

Endoscopy was performed in all the cases of the study and findings were noted. 81.54% of the cases revealed endoscopic gastritis, 6.77% with endoscopic duodenitis, 3.38% with gastro esophageal reflux disease, 2.46% with hiatus hernia and 6.15% with normal gastric mucosa. Among the 265 cases with endoscopic gastritis, 165 had hyperaemia, 65 had erosions, 20 with nodularity and 15 with ulcerations. Rapid urease test was positive in 272 cases (83.69%) and negative in 53 cases (16.31%) (Table 3). All the above findings were associated with statistical significance in our study ($p<0.05$).

Table 3: Findings on endoscopy and results of urease test among the cases in the study.

Endoscopic findings	**N**	**%**
Endoscopic gastritis	265	81.54
Normal gastric mucosa	20	6.15
Endoscopic duodenitis	22	6.77
GERD*	11	3.38
Hiatus hernia	8	2.46
Total	325	
Rapid urease test	**N**	**%**
Positive	272	83.69
Negative	53	16.31
Total	325	100

*GERD: Gastro oesophageal reflex disorder.

Table 4: Distribution of endoscopic findings and histopathological findings and rapid urease test with modified Sydney system of grading.

Histopathological features (n=325)	Endoscopic gastritis (n=265, 81.54%)				Rapid urease test	
	Hyperemia	**Erosions**	**Ulcerations**	**Nodularity**	**Positive**	**Negative**
Inflammatory cells	185	30	28	22	272	53
G0	-	-	-	-	-	20
G1	155	10	5	-	29	16
G2	17	9	5		49	8
G3	13	7	3	7	59	4
Activity (n=95)	10	4	6	4	85	1
Lymphoid follicles (n=75)			4	11	32	2
Atrophy (n=20)			5		10	1
Metaplasia (n=15)					8	1
Total	185	30	28	22	272	53

Table 5: Comparison between histological staining and rapid urease test in the study cases.

Type of test	*H. pylori* positive cases	*H. pylori* negative cases	% of positive cases
Rapid urease test	272	53	83.7
Histological examination by staining	265	60	81.53

Table 4 summarizes the distribution of endoscopic findings and histopathological findings and rapid urease test in accordance with modified Sydney system of grading. In gastric biopsies, inflammatory cellular infiltrates were found in 365 cases with varying intensity levels; with Grade 1 (G1) detected in 170 cases, Grade 2 (G2) in 31 cases; Grade 3 (G3) in 30 cases of our study. In addition lymphoid follicles were seen in 75 cases; and active inflammation with polymorph infiltration into lamina propria or glandular lamina in 95 cases. In the study, 20 cases demonstrated glandular atrophy and 15 cases with metaplasia (Table 4). Rapid urease test was positive in 85 cases with active inflammatory changes on histopathological finding and 59 cases with G3; 49 with G2 and 29 of G1. In our study, cases graded as G0 were Rapid urease test negative.

Table 5 explains the comparison between histological staining and rapid urease test and positive cases of *H. pylori* among the cases in the study. This explains that rapid urease test is more sensitive than histological staining in confirmation of *H. pylori* infection. Statistical significance was observed between rapid urease test and *H. pylori* positive cases in our study ($p<0.05$).

DISCUSSION

Gastritis associated with *H. pylori* infection is considered as a significant risk factor in causation of gastric carcinoma. Hence most of the management protocols are directed in prevention of *H. pylori* infection. Diagnosing a *H. pylori* infection is a primary task in management and various methods of diagnosis are available commercially. Amongst the various methods, histopathological diagnosis by staining and biochemical diagnosis by "Urease test" holds good in most of the studies both by sensitivity and specificity. Our study has highlighted the histopathological diagnosis in association with grading to evaluate the risk of progression to various other complications like mucosal atrophy, metaplasia and carcinoma.

In the present study, there was a large representation of males which reveals that males more represented than females with symptoms of gastritis. This may be due to the demographic predisposition that males are more in number than females in our study area. Similar findings with male preponderance of gastritis was reported by Bello et al who reported 72% in his study but a study done by Sharma et al documented 51% female seeking for gastritis as compared to 49% males.[5,6] This can be explained by differences in the geographical distribution of the study and differing risk factors of acquisition. An important observation of the study was incidence of gastritis increased with increase in the age of the cases which was similarly quoted in the study of Böhmer et al.[7] our study reported heart burn as the most common complaint followed by Dysphagia which was similar to the findings of Mabeku et al.[8] As described in majority of the studies universally smoking and alcoholism were significantly associated with association of gastritis due to *H. pylori* among the study subjects in the present study. Few studies reported dysphagia as the predominant symptom which may due to associated dietary habits and other risk factors in the study group.

In our study, endoscopic gastritis was the commonest finding followed by endoscopic duodenitis in association with other lesser findings. Similar findings were reported by Mandal et al in their study but the incidence was slightly higher around 87% among the study population with 23% of cases of duodenal gastritis which was lesser in our study.[9] However the variability among the studies may be due to genetic differences, dietary habits and also environmental factors. In 6.15% of cases with normal gastric mucosa on endoscopy, *H. pylori* was positive in 4 cases by histopathological examination and 8 cases by rapid urease test. The commonest finding among the cases of endoscopic gastritis was hyperaemia in 165 which was quite similar to the findings of Thapa et al who reported 76% among the cases in his study.[10] However results were conflicting with the findings in the study of Shrestha et al who reported erosions and nodularity as the most common features of endoscopic gastritis in his study.[11] A statistical significant association was observed among the features of gastritis and endoscopic findings.

In our study, rapid urease test was positive in 83.7% of cases which is similar to the finding of Uotani et al who reported 87% positive cases of urease test in his study.[12] However reports of Foroutan et al were not on par with the findings which state that only 65% of cases were positive for urease in their study.[13] These differences may be due to the difference in the geographic distribution of the study, variability in the study group population and the sensitivity and specify of the commercial kits used in the study.

In the present study, all the grades of gastritis showed colonization, but G0 was free. A statistical significant association was observed between endoscopic findings, inflammatory infiltration and *H. pylori* colonization. Relationship between (G0) gastritis and hyperaemia was insignificant in our study. Findings of our study were in parallel with the findings of Khan et al who reported that 32% of cases of chronic gastritis had normal endoscopic findings.[14] In our study, gastritis grading and *H. pylori* colonization was on par with findings of Rugge et al who found G1 gastritis in 51% of patients, G2 in 27.4%, and G3 in 17.2%.[15] In the study of Chen et al, a positive correlation was associated with prevalence of lymphoid follicles and *H. pylori* infection which correlates with the findings of our study.[16] Intestinal metaplasia was observed in 15 cases of the study and atrophy in 20 cases. This data is quite small to compare with the results of other studies.

CONCLUSION

To conclude on the present study, the prevalence of *H. pylori* infection is on a global rise and appropriate measures to reduce the prevalence is quite an urgent necessity. The chronicity of the condition and its associated complications make a definite threat to the health system. Hence appropriate steps in reduction should be considered as a health goal. To reduce appropriate diagnostic mechanism of high sensitivity is required with low financial constraints. Hence performing a rapid urease test and histopathological findings at biopsy may provide a definite clue in progression and severity of the disease. Histopathological interpretation of gastric biopsies is a reliable indicator of *H. pylori* infection as well as gastritis grading according to the Sydney grading system.

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