International Journal of Research in Health and Allied Sciences

Journal home page: www.ijrhas.com

Official Publication of "Society for Scientific Research and Studies" [Regd.]

ISSN: 2455-7803

Original Research

Evaluation of clinical, endoscopic and histopathological profile in patients with persistent dyspepsia

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ABSTRACT:

Aim: Evaluation of clinical, endoscopic and histopathological profile in patients with persistent dyspepsia. **Methods:** A hospital based observational study was done in the department Medicine at Guru Gobind Singh Medical College & Hospital, Faridkot in OPD or IPD.180 patients with Non-probability consecutive sampling were included in this study. Patients presenting with clinical symptoms of dyspepsia. (Epigastic pain, Postprandical fullness, Early satiation, Epigastric Pain, Nausea, Vomiting) were included in this study. Patients who show features of dyspepsia was subjected to upper GI endoscopy (FUJINON 530-WR video Upper Gasto-Intestinal).The endoscopically biopsy specimens were taken from lower part of oesophagus antrum and upper part of duodenum sent for histopathological examination in the Department of Pathology, GGSMCH, Faridkot. **Results:** Slight male predominance was seen with male female ratio being 1.1:1. Maximum patients were seen in age group 31-50 years with 46.1% patients. Maximum patients(85.6%) complaint of epigastric pain. Followed by nausea or vomiting which was present in 66.7% patients. 57.8% patients had heart burn while indigestion was seen in 48.3%food intolerance and loss of weight was seen in 11.3 and 11.6% patients respectively. Most common endoscopic diagnosis was gastritis(28.1%) followed by gastric ulcer(22.8%), duodenitis(15%), duodenal ulcer(8.9%), Esophagitis(7.2%) 4.4% patients had growth and was suspected of carcinoma ,12.8% had normal study. Most common histopathological diagnosis was chronic gastritis(26.1%) followed by gastric ulcer(19.4%),duodenitis(16.7%), duodenal ulcer(8.9%) , Esophagitis(8.9%) 3.9% patients had carcinoma ,1.1% had intestinal metaplasia while 6% patients had intestinal polyp. In 14.4% patients normal study was reported. No significant association was seen among various histopathological diagnosis and age group(P value= .75). In present study prevalence of h pylori was 45.6% and was detected by rapid urease test. Maximum patients of gastric ulcer and gastric carcinoma showed the presence of H. pylori where as none of the patients with normal study showed H. pylori. This association was statistically significant. **Conclusion:** *H. pylori* infection is one of the major causes of dyspeptic symptoms in the north Indian population. Although its prevalence is declining, it is still a public health burden in a developing country like India because it causes considerable individual suffering and, consequently, loss of manpower.

Keywords: dyspepsia, endoscopic, histopathological profile

Received: 17 January, 2022 Accepted: 21 February, 2022

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This article may be cited as: Garg R, Chawla SP, Singh Y, Soin D. Evaluation of clinical, endoscopic and histopathological profile in patients with persistent dyspepsia. Int J Res Health Allied Sci 2022; 8(2):58-65.

INTRODUCTION

Dyspepsia, the Greek term for bad digestion, has been commonly defined as upper abdominal discomfort, bloating, anorexia, early satiety, belching, regurgitation, nausea, or heartburn. This definition is too wide, and there is a need for more stringent criteria to obtain homogeneity in the studies. Historically, the Rome I and II consensus defined dyspepsia as "pain or discomfort in the upper abdomen," with "discomfort" including postprandial fullness, upper abdominal bloating, early satiety, epigastric burning, belching, nausea, and vomiting. The so-called Rome III criteria are postprandial fullness, early satiety, or epigastric pain or burning. The Rome IV criteria define dyspepsia as any combination of these 4 symptoms: postprandial fullness, early satiety, epigastric pain, and burning that are severe enough to interfere with the usual activities and occur at least 3 days per week over the last 3 months with an onset at least 6 months in

advance. Curiously, nausea and vomiting are not included in this classification of dyspepsia.[1] Heartburn, as the predominant symptom, has been considered to characterize patients with gastroesophageal reflux disease (GERD) and not dyspepsia, although overlap with dyspepsia is common. Persistent dyspepsia is referred to symptoms of dyspepsia persisting after two months of proton pump inhibitors.[2]

Patients usually present with several of these symptoms, leading to a variety of clinical presentations of dyspepsia, thus making it one of the most common problems in everyday clinical practice. The severity and intensity of symptoms also vary from very mild symptoms in patients who do not seek medical attention to very severe ones that may lead to sitophobia (fear to eat), anorexia, and weight loss.[3]

Dyspepsia can be divided into 2 main categories: "organic" when the clinical and laboratory investigation may identify an underlying organic disease that is likely to be the cause of the symptoms and "functional dyspepsia" (FD) when no organic abnormality is identified by the diagnostic workup, including gastroscopy and when no obvious specific cause of the symptoms has been found. Diagnostic overlap with GERD and irritable bowel syndrome (IBS) is very frequent, but it does not exclude a diagnosis of FD.[3]

Dyspeptic symptoms are very common in general population, with prevalence estimates ranging between 10% and 45%.[5] The results of prevalence studies are strongly influenced by criteria used to define dyspepsia, and in line with recent consensus definitions, it is essential that patients with predominant heartburn should be excluded, but this was not done in many of the studies. When heartburn is excluded, the prevalence of uninvestigated dyspepsia in the general population is in the range of 5% to 15%. Well-performed epidemiological studies have reported a prevalence of approximately 20% to 25% in the western world, slightly higher in women, with a variable influence of age across studies. The majority of these patients have no identifiable cause by standard diagnostic tests. The annual incidence rate of dyspepsia has been estimated to range between 1% and 6%.6 Long-term follow-up studies suggest improvement or symptom resolution in approximately half of the patients.[3,4]

Most peptic ulcers are associated with dyspepsia. 10%-25% of patients presenting with dyspepsia have peptic ulcer. The frequency of peptic ulcer is increased in patients who are older than age 40, have helicobacter pylori infection, use an NSAID, have dyspepsia at night, experience relief of pain with food or antacids, smoke. Gastric or Oesophageal Malignancy: Gastric or esophageal malignancy is present in less than 1% to 3% of patients with dyspepsia referred for endoscopy. The majority of cancers are advanced (like Stage – III or higher) at the time of presentation and a fewer than 5% occur in patient younger than 45 years of age. Gastro Oesophageal Reflux Disease, More than one third of patients with dyspepsia also have heart burn.[5]

A complete clinical history should be obtained and a physical examination performed in all patients with dyspepsia. The reason patient has sought medical consultation should be elicited. Symptoms and signs of systemic disorders that may cause dyspepsia such as cardiac disease, diabetes and thyroid disease should be considered. Signs such as abdominal organomegaly, mass, ascitis or positive fecal occult blood test necessitate further evaluation. Diseases presenting with dyspepsia fall into two general categories: organic and functional. Overall, most patients with dyspepsia have no underlying identifiable disease process. The diagnostic yield of organic causes is less in younger patients, and, conversely, serious organic lesions are common in elderly dyspeptic patients. Look for alarm features: Endoscopy should be performed in all dyspeptic patients with alarm features in order to exclude gastric or esophageal malignancy. Alarm features include unintended weight loss (Generally of at least 3kgs) progressive dysphagia persistent vomiting overt or occult gastrointestinal bleeding, unexplained anemia, jaundice, lymphadenopathy and a palpable abdominal mass.[6]

Prompt Endoscopy and Directed Treatment Diagnostic upper GI endoscopy offers direct recognition of organic causes of dyspepsia such as peptic ulcer, erosive esophagitis, or malignancy. The procedure may also have a reassurance effect on physicians and patients. Gastric mucosal biopsies allow diagnosing H. pylori infection, followed by eradication therapy if positive. It has been claimed that endoscopy may diagnose early gastric cancer at a curable stage, but this is relatively rare and evidence for the claim is at the best weak. However, endoscopy is also expensive and invasive and may not have a major impact on treatment after all. Patients with peptic ulcer or erosive esophagitis will receive antisecretory therapy. In those with negative upper endoscopy, FD and nonerosive GERD are likely diagnoses, and both can also be treated empirically with antisecretory therapy. In contrast, it has been argued that initial empirical antisecretory therapy will only delay the endoscopy, as both FD and GERD are likely to recur after discontinuation of empirical therapy at which time they will be referred for endoscopy. Nevertheless, most available practice guidelines will advocate initial endoscopy in all patients above a certain age threshold, usually 45 to 55 years old, in order to detect potentially curable upper GI malignancies.[6]

H. pylori is causally associated with peptic ulcer disease and is the most important risk factor for gastric cancer. Hence, several consensus panels support noninvasive testing for H. pylori in young patients (below 45 to 55 y) with uncomplicated dyspepsia. Patients with a positive test result should

receive eradication therapy (a PPI plus 2 antibiotics, such as amoxicillin and clarithromycin, for 10 to 14 days), whereas patients with a negative test result should be treated empirically, usually with a PPI. The benefits of this "test-and-treat" strategy are the cure of peptic ulcer disease or prevention of future peptic ulcers, and also the cure of a small subset (approximately 7%) of patients with FD who are H. pylori infected. Eradication of H. pylori eliminates chronic gastritis and this may, theoretically, contribute to a reduction of risk of H. Pylori-associated gastric cancer.[7,8]

MATERIALS AND METHODS

A hospital based observational study was done in the department Medicine at Guru Gobind Singh Medical College & Hospital, Faridkot in OPD or IPD.180 patients with Non-probability consecutive sampling were included in this study.

INCLUSION CRITERIA

- Patient's age 18 and above of any gender.
- Patients presenting with clinical symptoms of dyspepsia. (Epigastic pain, Postprandical fullness, Early satiation, Epigastric Pain, Nausea, Vomiting)

EXCLUSION CRITERIA

- Pregnant and lactating women.
- Patients presenting with lesions in the oral cavity and pharynx.
- Patients who were unfit for UGI Endoscopy or where Endoscopy is contraindicated.

METHODOLOGY

Informed consent was taken from all subjects. Detailed history was taken for each patient. Patients who show features of dyspepsia was subjected to upper GI endoscopy (FUJINON 530-WR video Upper Gasto-Intestinal).The endoscopically biopsy specimens were taken from lower part of oesophagus antrum and upper part of duodenum sent for histopathological examination in the Department of Pathology, GGSMCH, Faridkot. The endoscopic and histopathological findings of the patients and their clinical characteristics were assessed and the correlation between them was evaluated.

Rapid urease test:- This is strip based test. In this biopsy specimen placed on to disc containing urea and an indicator phenol red. Hence positive H. Test gives red colour.

RESULTS

Slight male predominance was seen with male female ratio being 1.1:1. Maximum patients were seen in age group 31-50 years with 46.1% patients.

Table 1 gender and age distribution of patients

Gender	No. of patients	% of patients
Female	85	47.2
Male	95	52.8
Age in years		
18-20	8	4.4
21-30	32	17.8
31-40	36	20
41-50	47	26.1
51-60	32	17.8
61-70	21	11.7
71-80	4	2.2
Total	180	100

Table 2: distribution of patients according to symptoms

Symptoms	No. of patients	% of patients
Epigastric pain	154	85.6
Heart burn	104	57.8
Nausea/vomiting	120	66.7
Food intolerance	20	11.3
Indigestion	82	45.6
Loss weight	21	11.6

Maximum patients (85.6%) complaint of epigastric pain. Followed by nausea or vomiting which was present in 66.7% patients. 57.8% patients had heart burn while indigestion was seen in 48.3%food intolerance and loss of weight was seen in 11.3 and 11.6% patients respectively.

36.7% patients had a history of taking spicy food and complaint that their dyspepsia increased with spicy food. 20.6% patients had a habit of alcohol while 25.6% patients had a history of smoking.

16.7% patients were on NSAIDs due to chronic conditions such as arthritis. Pallor was observed in 15% patients.

Table 3: distribution of patients according to endoscopic diagnosis

Endoscopic diagnosis	No. of patients	% of patients
Gastritis	52	28.9
Gastric ulcer	41	22.8
Duodenitis	27	15
Duodenal ulcer	16	8.9
Esophagitis	13	7.2
Growth	8	4.4
Normal Study	23	12.8
Total	180	100

Most common endoscopic diagnosis was gastritis(28.1%) followed by gastric ulcer(22.8%), duodenitis(15%), duodenal ulcer(8.9%), Esophagitis(7.2%) 4.4% patients had growth and was suspected of carcinoma, 12.8% had normal study.

Table 4: distribution of patients according to histopathological diagnosis

Histopathological diagnosis	No. of patients	% of patients
Chronic Gastritis(Gs)	47	26.1
Gastric ulcer(GU)	35	19.4
Duodenitis(Ds)	30	16.7
Duodenal ulcer(DU)	16	8.9
Esophagitis(Es)	16	8.9
Carcinoma(Ca)	7	3.9
Intestinal metaplasia(IM)	2	1.1
Polyp	1	0.6
Normal Study(NS)	26	14.4
Total	180	100

Most common histopathological diagnosis was chronic gastritis(26.1%) followed by gastric ulcer(19.4%), duodenitis(16.7%), duodenal ulcer(8.9%), Esophagitis(8.9%) 3.9% patients had carcinoma ,1.1% had intestinal metaplasia while 6% patients had intestinal polyp. In 14.4% patients normal study was reported.

Table 5: association between age group and histopathological diagnosis

	ca	Ds	DU	Es	Gs	GU	IM	NS	POLYP	Total
18-20	0 0.0%	2 6.7%	0 0.0%	0 0.0%	3 6.4%	1 2.9%	0 0.0%	2 7.7%	0 0.0%	8 4.4%
21-30	0 0.0%	2 6.7%	1 6.3%	1 6.3%	12 25.5%	8 22.9%	0 0.0%	8 30.8%	0 0.0%	32 17.8%
31-40	1 14.3%	9 30.0%	5 31.3%	4 25.0%	7 14.9%	4 11.4%	1 50.0%	5 19.2%	0 0.0%	36 20.0%
41-50	2 28.6%	9 30.0%	4 25.0%	4 25.0%	13 27.7%	6 17.1%	0 0.0%	8 30.8%	1 100.0%	47 26.1%
51-60	3 42.9%	5 16.7%	3 18.8%	4 25.0%	6 12.8%	9 25.7%	0 0.0%	2 7.7%	0 0.0%	32 17.8%
61-70	1 14.3%	3 10.0%	2 12.5%	3 18.8%	5 10.6%	5 14.3%	1 50.0%	1 3.8%	0 0.0%	21 11.7%
71-80	0 0.0%	0 0.0%	1 6.3%	0 0.0%	1 2.1%	2 5.7%	0 0.0%	0 0.0%	0 0.0%	4 2.2%
Total	7 100.0%	30 100.0%	16 100.0%	16 100.0%	47 100.0%	35 100.0%	2 100.0%	26 100.0%	1 100.0%	180 100.0%

No significant association was seen among various histopathological diagnosis and age group(P value= .75).

Table 6: relationship between various diagnosis and sex

	Female		Male		Total		p-value
	n	%	n	%	n	%	
ca	4	57.1%	3	42.9%	7	100.0%	.1
Ds	15	50.0%	15	50.0%	30	100.0%	
DU	12	75.0%	4	25.0%	16	100.0%	

Es	4	25.0%	12	75.0%	16	100.0%	
Gs	21	44.7%	26	55.3%	47	100.0%	
GU	17	48.6%	18	51.4%	35	100.0%	
IM	0	0.0%	2	100.0%	2	100.0%	
NS	11	42.3%	15	57.7%	26	100.0%	
POLYP	1	100.0%	0	0.0%	1	100.0%	
	85	47.2%	95	52.8%	180	100.0%	

No significant association was seen between age and gender of the patient.

Table 7: prevalence of h. pylori in study population

H-pylori	No. of patients	%age
Absent	98	54.4
Present	82	45.6
Total	180	100.0

In present study prevalence of h pylori was 45.6% and was detected by rapid urease test.

Table 8: prevalence of h. pylori in relation to histopathological findings

	HPYLORI absent		HPYLORI present		Total		P value
	n	%	n	%	n	%	
CA	2	28.6%	5	71.4%	7	100.0%	<.001
Ds	20	66.7%	10	33.3%	30	100.0%	
DU	6	37.5%	10	62.5%	16	100.0%	
Es	12	75.0%	4	25.0%	16	100.0%	
Gs	23	48.9%	24	51.1%	47	100.0%	
GU	6	17.1%	29	82.9%	35	100.0%	
IM	2	100.0%	0	0.0%	2	100.0%	
NS	26	100.0%	0	0.0%	26	100.0%	
POLYP	1	100.0%	0	0.0%	1	100.0%	
	98	54.4%	82	45.6%	180	100.0%	

Maximum patients of gastric ulcer and gastric carcinoma showed the presence of H. pylori where as none of the patients with normal study showed H. pylori. This association was statistically significant.

Table 9: prevalence of h. pylori in relation to endoscopic diagnosis

	HPYLORI absent		HPYLORI present		Total		P value
	n	%	n	%	n	%	
CA	3	37.5%	5	62.5%	8	100.0%	.001
Ds	18	66.7%	9	33.3%	27	100.0%	
DU	9	56.3%	7	43.8%	16	100.0%	
Es	12	92.3%	1	7.7%	13	100.0%	
Gs	23	44.2%	29	55.8%	52	100.0%	
GU	14	34.1%	27	65.9%	41	100.0%	
NS	19	82.6%	4	17.4%	23	100.0%	
Total	98	54.4%	82	45.6%	180	100.0%	

Maximum patients of gastric ulcer showed the presence of h pylori where as none of the patients with normal study showed h pylori. This association was statistically significant.

No significant association was seen between patients with h-pylori infection and age of the patients.

No significant correlation was seen between gender and hpylori infection.

Total 8 cases of growth were detected by endoscopy byhistopathologically 7 cases of carcinoma were detected while 1 cases was diagnosed as polyp. Out of 30 cases of duodenitis detected by endoscopy21 were correctly diagnosed byhistopathology. Out of 16 cases of DU and esophagitis 11 were correctly identified by endoscopy. 35 cases of gastritis and 25 cases of gastric ulcer were correctly diagnosed by endoscopy out of 47 gastritis and 35 gastric ulcer total cases detected via histopathology. Normal study was diagnosed correctly in 16 cases by endoscopy while 10 cases were falsely diagnosed.

DISCUSSION

In present study total 180 patients of dyspepsia were included it was seen that Maximum patients were seen in age group 31-50 years with 46.1% patients. The mean age of the patients was 44.3 years ±14.2 years. Tanni et al[9] in their study of the mean age of the patients to be 42.33 ± 14.30 and around 46% patients in age group of 31-50 years. Desai et al in

their study reported the Mean age of patient to be 40.04 ± 14.34 years.

In present study 47.2% patients were females while 52.8% patients were males. Slight male predominance was seen with male female ratio being 1.1:1. Gado A et al.[10] reported the incidence of 51% in males and 49% in females. Thomson A.B.R et al.[11] reported a male to female ratio of 1:1. In India Sumathi B et al.[12] reported a male to female ratio of 1.5:1 and Sunil Kumar et al.[13] reported a ratio of 1.05:1.

Maximum patients (85.6%) in present study complaint of epigastric pain. Followed by nausea or vomiting which was present in 66.7% patients. 57.8% patients had heart burn while indigestion was seen in 48.3 m food intolerance and loss of weight was seen in 11.3 and 11.6% patients respectively. In a study by Desai et al.[14]also epigastric pain was the most common presentation of patients. In a study by Agarwal et al.[15] also, abdomen (epigastric) pain was reported by 81% patients, gastric fullness by 68%, nausea by 71%, vomiting by 25%, fat intolerance by 13%, bloating by 76%, blenching by 67%, melena by 4%, and early satiety by 47% patients. Segni M. Ayana et al.[16] also reported epigastric pain in 86.1% of patients with dyspepsia. Oung et al.[17] showed that majority of patients had overlapping symptoms of epigastric pain/burning and postprandial fullness/early satiety (40.6%), followed by epigastric pain/burning alone (29.7%) and postprandial fullness/early satiety alone (29.7%).

In present study the most common endoscopic diagnosis was gastritis(28.1%) followed by gastric ulcer(22.8%),duodenitis(15%), duodenal ulcer(8.9%) , Esophagitis(7.2%) 4.4% patients had growth and was suspected of carcinoma. 12.8% of the patients had normal study despite of despeptic symptoms.

Sumathi B et al. reported a normal study in 1453 patients (42.3%), and 44.3% in patients with dyspepsia without alarm symptoms and 34.7% in patients with dyspepsia with alarm symptom.[12] Gado A et al.[10] reported normal findings in 65% patients presenting with dyspepsia and 82% of patients younger than 30years.

In a study by Desai et al.[14] endoscopic findings were diagnosed in 56.32% dyspeptic patients; PU (25.95%), esophagitis (4.43%), and UGI malignancy (3.16%). Other significant lesions constituted less than 2%. While other patients had a normal study. Tanni et al.[9] in their study reported that among the 143 cases, the majority of patients endoscopically had erosive gastritis (37.1%), followed by gastritis (33.6%), gastric ulcer (14.0%), duodenal ulcer (7.7%), and gastric carcinoma (3.5%); these figures were similar to those found in another study conducted in Dhaka (Kismat et al. 2019).[18] In our study, gastritis was the most common endoscopic abnormality among the study population, and also among those who were found to be infected with *H. Pylori*.

Most common histopathological diagnosis in present study was chronic gastritis(26.1%) followed by gastric ulcer(19.4%),duodenitis(16.7%), duodenal ulcer(8.9%) , Esophagitis(8.9%) 3.9% patients had carcinoma,1.1% had intestinal metaplasia while.6% patients had intestinal polyp. In 14.4% patients normal study was reported. Tanni et al reported the most common histopathological finding to be chronic gastritis (70.63%), followed by gastric ulcer (13.28%), duodenal ulcer (6.30%), intestinal metaplasia (2.80%), gastric carcinoma (2.09%), with 4.90% found to have normal gastric mucosa. Kannan et al[19] in their study showed that histologically, the most common findings were chronic inflammation which varied from mild to severe. Moderate inflammation with mononuclear cells was seen in 54% of the cases and severe inflammatory infiltrate was seen in 20% of the cases. 26% of the cases had mild chronic inflammation. Mild glandular atrophy was seen in 5% of cases and moderate atrophy in 2% of the cases. Activity with neutrophilic infiltration was seen on 73% of cases with moderate and severe activity in 21% and 12% of cases respectively. Intestinal metaplasia was seen in 17% of the cases.

In present study prevalence of H-pylori was 45.6% and was detected by rapid urease test. Maximum patients of gastric ulcer, gastritis and gastric carcinoma showed the presence of h pylori where as none of the patients with normal study showed h pylori. This association was statistically significant. No significant association was seen between h-pylori and age group and sex. In present study it was observed that HPYLORI was significantly more in patients who were taking spicy food and were on NSAID.

In present study rapid urease test and histological staining for *H. pylori*, was used for detection of Hpylori. According to the definition of *H. pylori*-positive cases used in this study, 45.6%(82/180) cases were classified as h-pylori positive. Similar results were shown by Aftab et al. (2018)[20], who reported a 47% prevalence of *H. pylori* infection in adult dyspeptic patients. in a study by Tanni et al 32.9% were classified as *H. pylori*-positive and 67.1% as *H. pylori*-negative. Niknam et al. (2014)[21], in their study reported 31% *H. pylori* positivity among the adult dyspeptic population in Iran, and in a study by aggarwal et al[15]*H. pylori* infection was diagnosed in 85% of patients which was more than observed in the present study.

The present study was in accordance to a study by Singh et al. (2002)[22], which did not find any significant association between *H. pylori* infection and sex. Tanni et al in their study reported that the prevalence of *H. pylori* infection was slightly higher in the female population (53.20%) compared with males (46.80%), although this difference was not significant. Another study by Ibrahim et al.[2368] (2017) found males to have a greater prevalence of *H. pylori* infection. Agarwal et al[1548]also did not get a

significant difference in *H. pylori* prevalence according to gender. Also male-to-female ratio is in concordance with the study done by Adlekha et al., Tarkhashvili et al., Isabelle et al. and Shokrzadeh et al.[24-27]Total 8 cases of growth were detected by endoscopy by histopathologically 7 cases of carcinoma were detected while 1 cases was diagnosed as polyp. Out of 30 cases of duedonitis detected by histopathology 21 were correctly diagnosed by endoscopy. Out of 16 cases of DU and esophagitis 11 were correctly identified by endoscopy in both cases. 35 cases of gastritis and 25 cases of gastric ulcer were correctly diagnosed by endoscopy out of 47 gastritis and 35 gastric ulcer total cases detected via histopathology. Normal study was diagnosed correctly in 16 cases by endoscopy while 10 cases were falsely diagnosed. Endoscopic findings were significantly correlated with histological findings ($p< 0.001$).

CONCLUSION

H. pylori infection is one of the major causes of dyspeptic symptoms in the north Indian population. Although its prevalence is declining, it is still a public health burden in a developing country like India because it causes considerable individual suffering and, consequently, loss of manpower. Proper evaluation and eradication therapy are needed to overcome this situation. Since significant correlations between endoscopy and histopathology findings have been observed, endoscopic examination can be used as an alternative for gastric disease detection where histopathology is not available. However, normal endoscopic appearance is a poor predictor of histological findings. *H. pylori* infection may be positively associated with gastric ulcer and GI carcinoma in a statistically significant manner.

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