Correlating Upper GI Symptoms and Endoscopic Findings with H Pylori Positivity – A Rural Tertiary Care Perspective

Authors
Shuba Srinivasan¹, Sneha Thomas², Ramkumar Kurpad R³, Prakash H Muddegowda⁴, Jyothi B Lingegowda⁵, Chinnappa Rajan⁶

¹Associate Professor, Department of Medicine, DM Wayanad Institute of Medical Sciences, Wayanad
²Assistant Professor, Department of Medicine, DM Wayanad Institute of Medical Sciences, Wayanad
³Consultant Pathologist, Mediheal Hospital, Kenya
⁴Associate Professor, Department of Immunohematology and Transfusion Medicine, Vinayaka Missions KirupanandaVariyar Medical College, Salem
⁵Associate Professor, Dept of Pathology, Vinayaka Missions KirupanandaVariyar Medical College, Salem
⁶Professor and HOD, Department of Medicine, DM Wayanad institute of medical sciences, Wayanad

Corresponding Author
Dr Shuba S
No. 703, DM WIMS campus, Naseeranagar, Meppadi, Wayanad District, Kerala – 673577
Email: anishuram@gmail.com, Mobile: 9526020031

Abstract

Introduction: H pylori infection is associated with wide spectrum of neoplastic and non-neoplastic lesions and commonly presents as dyspepsia. Upper gastrointestinal endoscopy not only helps to differentiate between organic and functional dyspepsia, but also helps in the diagnosis of H pylori infection. In this study we aim to assess the prevalence of helicobacter pylori associated gastrointestinal diseases using rapid urease test (RUT) in patients undergoing endoscopy with upper GI symptoms in rural Kerala.

Materials and Methods: This observational cross sectional descriptive study was done in the Department of Gastroenterology at DM Wayanad institute of medical sciences, which is a tertiary care setup in rural Kerala. 510 patients, who underwent gastrointestinal endoscopy for various upper GI symptoms were included in the study. After applying exclusion criteria, 479 patients with demographic details, upper GI symptoms list, endoscopic findings and H pylori results formed the crux of the study.

Results: Among 479 patients evaluated, males (58%) were predominant. 248 (51.7%) of the 479 patients were H pylori positive. Dyspepsia (66.5%) was the commonest symptom amongst the H pylori positive patients. Gastritis was the commonest endoscopic finding followed by esophagitis and duodenal ulcer both in the general study group and in the H pylori positive group. Amongst 8 patients with carcinoma of stomach, 7 patients were positive for H pylori infection and this association was statistically significant.

Conclusion: Dyspepsia as a symptom has great social and economic impact and is the commonest symptom presenting to the physician. Being a developing country with limited resources and its ever increasing elderly population and high prevalence of H pylori and dyspeptic symptoms, larger study to frame appropriate guidelines for endoscopy and empirical treatment of dyspepsia is desired.

Keywords: H pylori, upper gastrointestinal endoscopy, dyspepsia, rural Kerala.
INTRODUCTION
The most common complaint of upper gastrointestinal disorders worldwide is dyspepsia, approximately 10-20% in the Asia Pacific region. It forms 1/3rd of individuals seeking healthcare and is relapsing, complicated and confusing. Dyspepsia is a poorly characterized syndrome, defined as chronic or recurrent central upper abdominal pain or discomfort, which can be attributed to the upper gastrointestinal tract. This can incorporate a variety of symptoms such as epigastric discomfort, early satiety, heart burn, upper abdominal fullness, early satiety, bloating, belching or nausea. Dyspepsia according to Rome III criteria should include 1 or more of the following 3 symptoms for 3 months within 6 months of symptoms initial onset: 1. Post prandial fullness, 2. Early satiety, and 3. Epigastric pain or burning.\(^{(1-4)}\)

One of major causes of dyspepsia and its associated spectrum is the presence of helicobacter pylori (H. pylori) infection especially in patients younger than 50 years of age. Patient age and alarm features like age $\geq$ 50 years, family history of upper GI malignancy in a first degree relative, unintended weight loss, GI bleeding or iron deficiency anemia, dysphagia, odynophagia, persistent vomiting and abnormal imaging suggestive of organic disease are used to categorize patients with dyspepsia for endoscopy, as they may harbor significant pathology.\(^{(1)}\) Since, the discovery of H. pylori as an important etiological agent in gastroduodenal disease, investigation for this organism during UGI endoscopy has become a standard clinical practice. Principally endoscopy is essential for classifying a patient’s condition as functional or organic dyspepsia. One half of the world's population has H. pylori infection, with an estimated prevalence of more than 90% in developing countries\(^{(5,6)}\). Dyspepsia has a significant impact on quality of life, and results in enormous societal costs, either due to direct medical costs for physician visits, diagnostic tests, medications, or indirect costs from absenteeism or reduced productivity at work.\(^{(8-9)}\) H. pylori is a class 1 carcinogen and a known risk factor for active gastritis, peptic ulcers, mucosa-associated lymphoid tissue lymphoma, and gastric cancer and surprisingly could be protective against gastric esophageal reflux disease.\(^{(10,11)}\)

With endoscopy, biopsy based tests like rapid urease testing (RUT), histopathology and even culture can be done. Histopathology after endoscopy is often considered the gold standard for diagnosis of helicobacter pylori, and this may not be readily available in all parts of the world especially in resource poor settings. In low-resource communities, considerations of precision and sensitivity may sometimes be traded against costs and the availability of resources. In regions of high H. pylori prevalence, treatment could be more practical than diagnostic tests.\(^{(12,13)}\)

In this study we aim to assess the prevalence of helicobacter pylori associated gastrointestinal diseases using RUT in patients undergoing endoscopy with upper GI symptoms in rural Kerala.

MATERIALS AND METHODS
This observational cross sectional descriptive study was done in the Department of Gastroenterology at DM Wayanad institute of medical sciences, which is a tertiary care setup in rural Kerala. 510 patients, who underwent gastrointestinal endoscopy for various upper GI symptoms were included in the study. The indications for subjecting the patients to the endoscopy procedure were as follows; patients who had complaints of dyspepsia, pain abdomen, heartburn, dysphagia, hematemesis and anemia. We included other symptoms like recurrent vomiting, belching, burping, epigastric pain and nausea under dyspepsia. Patients with esophageal varices, under 18 years, incomplete details, foreign body ingestion or those who refused consent were excluded from the study. The sex, age, symptoms, alarm symptoms, endoscopic findings, H pylori RUT and histological findings,
when necessary were recorded. A written consent was taken from all patients prior to the procedure. Patient endoscopy preparation involved 8 hrs of fasting. All patients underwent blood tests for HIV, HBs Ag and HCV prior to endoscopy. In conscious a patients, a topical anesthetic xylocaine 5% was sprayed into the oropharynx to numb the gag reflex. Sedation with intravenous midazolam 0.1 mg/kg was used only in patients who requested for sedation. Endoscopic evaluation of patients was carried out using a Olympus fibre optic gastro-duodenoscope and standard procedures were followed. Instrument sterilization was done using a routine technique of cleaning the instrument with cetrimide, 70% alcohol, glutaraldehyde (Cidex®) and later running equipment in water for up to 15 minutes in between endoscopic sessions. Patients were placed in the left lateral decubitus position with pulse oximetry monitoring of their vital sign by a trained staff nurse. All anatomic regions of the oesophagus, stomach, first and second parts of the duodenum whenever possible were examined and endoscopic impressions noted.

The endoscopy procedure included, taking a biopsy sample, approximately 2-3mm size from the antral gastric mucosa. This sample was placed on yellow colored well containing urea and a pH indicator. The production of the urease enzyme by H. pylori results in the decomposition of urea into bicarbonate and ammonia which causes the pH to rise and the color of the dot to change from yellow to red or pink (Fig 1). Positive results were read within 5 to 30 min. Samples that were weakly positive took up to 1 h to develop and no color change at 1 h was regarded negative (Fig 2). Rapid urease test using commercially available RUT kit was used for detecting the presence of H pylori infection on gastric mucosal biopsies.

RESULTS

Amongst the 510 patients, 31 patients were excluded from the study due to presence of esophageal varices. The remaining 479 patients fulfilled the inclusion criteria and were included in the study. H pylori testing was available in 477 patients as Rapid urease test was inconclusive in two cases (Table 1).

Of the 479 patients evaluated, males were 278 (58%) and females were 201 (42%). Dyspepsia (67.4%) was the most commonest symptoms altogether and it was the main presenting complaint amongst males (56.6%) and was more common in the fourth decade (Table 2). The second most common symptom was pain abdomen which accounted for 14.4% of all patients studied of which 56.5% were males and 43.3% were females (Table 1).

50.3% of males were smokers. 95.6% of the patients consumed non vegetarian diet with only 4.4% being vegetarian. 58.6% of the smokers were H pylori positive. This correlation is probably not statistically significant. 248 (51.7%) of the 479 patients were found to be H pylori positive (Table 3) Of the 323 patients with dyspepsia, 165(66.5%) were H pylori positive. Of the 165 dyspeptic patients who were H pylori positive, gastritis (69.1%) (Table 4 & 5) was the most common finding on endoscopy.

Overall, gastritis at 59.4% was the most common endoscopic finding in the study population (Table 4). 61.4% of males and 38.6% of females had gastritis. Esophagitis was seen in 5.2% followed by duodenal ulcer and gastroduodenitis which was seen in 3.1% of patients.

97(20.2%) of patients had normal endoscopy with no mucosal lesions and it was more common in the patients <20 years (Table 6). Some in this group had lax lower esophageal sphincter, however as the mucosa was normal, they were considered as normal. In the study 8 (1.6%) cases of CA stomach and 4 (0.8%) cases of ca esophagus with histopathology confirmation was noted. Almost all the lesions showed a male
preponderance except gastric ulcer which had equal numbers of male and female patients. Gastritis was present in 273 patients of which 156 (62.9%) were H pylori positive (Table 4 & 5). This was a statistically significant correlation between Gastritis and H pylori positivity (p=0.009). Refer table 4. 97(20.2%) of patients had normal endoscopy with no mucosal lesions. Only 24 patients were H. pylori positive. The negative correlation between normal endoscopy and H pylori was statistically significant (p<0.001). Of the 479 patients studied, 248 (51.7%) of patients were positive for H pylori of which 60% were males and 40% were females. Maximum no. of patients were between 30 and 70 years of age both amongst males and females (Table 5 & 6).

Of the 8 patients with CA stomach, 7 patients were H pylori positive. The correlation between Ca stomach and H pylori was statistically significant (p=0.043). 85.7% were males and 14.3% were females. This showed a significant male preponderance. All the patients with duodenal ulcer and gastroduodenitis. Both the lesions showed a male preponderance. 12 out of 25 of patients with reflux esophagitis were H pylori positive. 58.3% were males and 41.7% were females. As in the general population, patients with H pylori also showed a significant male preponderance with respect to almost all endoscopic lesions. The correlation between esophagitis and H pylori was not statistically significant (p=0.682).

Table 1: Prevalence of symptoms in male and female

| Cases                      | Total cases positive (out of 479) | Males (278) | Females (201) |
|----------------------------|----------------------------------|-------------|---------------|
| Dyspepsia                  | 323 (67.4%)                      | 183 (65.8%) | 140 (69.7%)   |
| Pain abdomen               | 66 (13.8%)                       | 36 (12.9%)  | 30 (14.9%)    |
| Heart burn                 | 26 (5.4%)                        | 14 (5%)     | 12 (6%)       |
| Hematemesis                | 21 (4.4%)                        | 16 (5.8%)   | 5 (2.5%)      |
| Dysphagia                  | 27 (5.6%)                        | 15 (5.4%)   | 12 (6%)       |
| Anaemia                    | 13 (2.7%)                        | 11 (4%)     | 2 (1%)        |
| CLD/ Portal hypertension   | 3 (0.6%)                         | 3 (1.1%)    | 0             |
| Total                      | 479 (100%)                       | 278 (100%)  | 201 (100%)    |

CLD – Chronic liver disease
Table 2: Age distribution of symptomatology

| Symptoms       | <20 (73.3%) | 20-29 (72.2%) | 30-39 (75.8%) | 40-49 (71.3%) | 50-59 (71.1%) | >/=60 (51.3%) | Total       |
|----------------|-------------|---------------|--------------|--------------|--------------|---------------|-------------|
| Dyspepsia      | 11 (73.3%)  | 39 (72.2%)    | 72 (75.8%)   | 72 (71.3%)   | 69 (71.1%)   | 60 (51.3%)    | 323 (67.4%) |
| Pain abdomen   | 1 (6.6%)    | 7 (13%)       | 10 (10.5%)   | 14 (13.9%)   | 10 (10.3%)   | 24 (20.5%)    | 66 (13.8%)  |
| Heart burn     | 1 (6.7%)    | 2 (3.7%)      | 9 (9.5%)     | 5 (5%)       | 5 (5.2%)     | 4 (3.4%)      | 26 (5.4%)   |
| Hematemesis    | 1 (6.7%)    | 0             | 0            | 4 (4%)       | 2 (2.1%)     | 14 (12%)      | 21 (4.4%)   |
| Dysphagia      | 1 (6.7%)    | 6 (11.1%)     | 4 (4.2%)     | 2 (2%)       | 8 (8.2%)     | 6 (5.1%)      | 27 (5.6%)   |
| Anaemia        | 0           | 0             | 0            | 3 (3%)       | 2 (2.1%)     | 8 (6.8%)      | 13 (2.7%)   |
| CLD/ portal hypertension | 0 | 0 | 0 | 1 (1%) | 1 (1%) | 0.9% | 3 (0.6%) |
| Total          | 15 (100%)   | 54 (100%)     | 95 (100%)    | 101 (100%)   | 97 (100%)    | 117 (100%)    | 479 (100%) |

CLD – Chronic liver disease

Table 3: Correlation of symptoms with H pylori infection

| Symptoms         | Rapid Urease test (RUT) | Absent | Present | Pearson chi-square test (Asymp sig (2 sided)) |
|------------------|-------------------------|--------|---------|-----------------------------------------------|
| Dyspepsia        | RUT positive            | 83 (33.5%) | 165 (66.5%) | 0.565                                        |
|                  | RUT negative            | 71 (31%)   | 158 (69.0%) |                                              |
| Pain Abdomen     | RUT positive            | 212 (85.5%) | 36 (14.5%)  | 0.655                                        |
|                  | RUT negative            | 199 (86.9%) | 30 (13.1%)  |                                              |
| Heart burn       | RUT positive            | 233 (94%)  | 15 (6%)    | 0.550                                        |
|                  | RUT negative            | 218 (95.2%) | 11 (4.8%)   |                                              |
| Haematemesis     | RUT positive            | 233 (94%)  | 15 (6%)    | 0.068                                        |
|                  | RUT negative            | 223 (97.4%) | 6 (2.6%)    |                                              |
| Dysphagia        | RUT positive            | 238 (96%)  | 10 (4%)    | 0.218                                        |
|                  | RUT negative            | 214 (93.4%) | 15 (6.6%)   |                                              |
| Anemia           | RUT positive            | 242 (97.6%) | 6 (2.4%)    | 0.669                                        |
|                  | RUT negative            | 222 (96.9%) | 7 (3.1%)    |                                              |
| CLD/ Portal HTN  | RUT positive            | 247 (99.6%) | 1 (0.4%)    | 0.516                                        |
|                  | RUT negative            | 227 (99.1%) | 2 (0.9%)    |                                              |

Table 4: Gender distribution of endoscopic findings

| Endoscopy findings | Total cases positive (out of 479) | Males (278) | Females (201) |
|--------------------|-----------------------------------|-------------|---------------|
| Ca stomach         | 8 (1.7%)                          | 7 (2.5%)    | 1 (0.5%)      |
| Ca esophagus       | 4 (0.8%)                          | 3 (1.1%)    | 1 (0.5%)      |
| Duodenal ulcer     | 15 (3.1%)                         | 11 (4%)     | 4 (2%)        |
| Gastric ulcer      | 6 (1.3%)                          | 3 (1.1%)    | 3 (1.5%)      |
| Esophagitis        | 25 (5.2%)                         | 17 (6.1%)   | 8 (4%)        |
| Esophageal candidiasis | 9 (1.9%)                            | 6 (2.2%)    | 3 (1.5%)      |
| Esophageal ulcer   | 7 (1.5%)                          | 4 (1.4%)    | 3 (1.5%)      |
| Gastroduodenitis   | 15 (3.1%)                         | 12 (4.3%)   | 3 (1.5%)      |
| Normal             | 97 (20.3%)                        | 35 (12.6%)  | 62 (30.8%)    |
| Gastritis          | 273 (57%)                         | 165 (59.4%) | 108 (53.7%)   |
| Miscellaneous      | 20 (4.2%)                         | 15 (5.4%)   | 5 (2.5%)      |
| Total              | 479 (100%)                        | 278 (100%)  | 201 (100%)    |
Table 5: Correlation of esophagogastroduodenoscopy findings with H pylori

| Endoscopic findings          | Rapid urease test (RUT) | Absent | Present | Pearson chi-square test (Asymp sig (2 sided)) |
|------------------------------|-------------------------|--------|---------|---------------------------------------------|
| CA STOMACH                   | RUT positive            | 241 (97.2%) | 7 (2.8%) | 0.043                                       |
|                             | RUT negative            | 228 (99.6%) | 1 (0.4%) |                                            |
| CA ESOPHAGUS                 | RUT positive            | 246 (99.2%) | 2 (0.8%) | 0.936                                       |
|                             | RUT negative            | 227 (99.1%) | 2 (0.9%) |                                            |
| DUODENAL ULCER               | RUT positive            | 233 (94%)  | 15 (6%)  | 0.000                                       |
|                             | RUT negative            | 229 (100%) | 0       |                                            |
| GASTRIC ULCER                | RUT positive            | 243 (98%)  | 5 (2%)   | 0.122                                       |
|                             | RUT negative            | 228 (99.6%) | 1 (0.4%) |                                            |
| ESOPHAGITUS                  | RUT positive            | 236 (95.2%) | 12 (4.8%) | 0.682                                       |
|                             | RUT negative            | 216 (94.3%) | 13 (5.7%) |                                            |
| ESOPHAGEAL CANDIDIASIS       | RUT positive            | 245 (98.8%) | 3 (1.2%) | 0.258                                       |
|                             | RUT negative            | 223 (97.4%) | 6 (2.6%) |                                            |
| ESOPHAGEAL ULCER             | RUT positive            | 245 (98.8%) | 3 (1.2%) | 0.626                                       |
|                             | RUT negative            | 225 (98.3%) | 4 (1.7%) |                                            |
| GASTRODUODENITIS             | RUT positive            | 233 (94%)  | 15 (6%)  | 0.000                                       |
|                             | RUT negative            | 229 (100%) | 0       |                                            |
| NORMAL                       | RUT positive            | 224 (90.3%) | 24 (9.7%) | <0.001                                      |
|                             | RUT negative            | 156 (68.1%) | 73 (31.9%) |                                            |
| GASTRITIS                    | RUT positive            | 92 (37.1%)  | 156 (62.9%) | 0.009                                       |
|                             | RUT negative            | 112 (48.9%) | 117 (51.1%) |                                            |
| MISCELLANEOUS                | RUT positive            | 242 (97.6%) | 6 (2.4%)  | 0.106                                       |
|                             | RUT negative            | 217 (94.8%) | 12 (5.2%) |                                            |

Table 6: Age distribution of endoscopic findings

| Endoscopic findings | <20 | 20-29 | 30-39 | 40-49 | 50-59 | >50 | Total |
|---------------------|-----|-------|-------|-------|-------|-----|-------|
| Ca stomach          | 0   | 0     | 0     | 2 (2%) | 1 (1%) | 1   | 8 (1.7%) |
| Ca esophagus        | 0   | 0     | 0     | 0     | 0     | 6   | 4 (0.8%) |
| Duodenal ulcer      | 2 (13.3%) | 3 (3.2%) | 2 (2%) | 1 (1%) | 5 (4.3%) | 15 | 3 (1.3%) |
| Gastric ulcer       | 1 (1%) | 1 (1%) | 1 (1%) | 1 (1%) | 3 (2.6%) | 6 (1.3%) |
| Esophagitis         | 1 (6.7%) | 7 (7.4%) | 5 (5%) | 5 (5.2%) | 3 (2.6%) | 25 (5.2%) |
| Esophageal candidiasis | 0 | 1 (1%) | 3 (3.1%) | 5 (4.3%) | 9 (1.9%) |
| Esophageal ulcer    | 0 (0.0%) | 2 (2.1%) | 1 (1%) | 0 (0.0%) | 4 (3.4%) | 7 (1.5%) |
| Gastroduodenitis    | 1 (6.7%) | 3 (5.6%) | 2 (2.1%) | 4 (4%) | 3 (3.1%) | 2 (1.7%) | 15 (3.1%) |
| Normal              | 6 (40%) | 14 (25.9%) | 17 (17.9%) | 23 (22.8%) | 17 (17.5%) | 20 (17.1%) | 97 (20.3%) |
| Gastritis           | 5 (33.3%) | 30 (55.6%) | 60 (63.2%) | 62 (61.4%) | 60 (61.9%) | 56 (47.9%) | 273 (57%) |
| Miscellaneous       | 0 | 1 (1.9%) | 2 (2.1%) | 1 (1%) | 6 (6.2%) | 10 (8.5%) | 20 (4.2%) |
| Total               | 15 (100%) | 54 (100%) | 95 (100%) | 101 (100%) | 97 (100%) | 117 (100%) | 479 (100%) |

Table 7: Various studies showing leading endoscopic findings and H pylori prevalence in dyspepsia

| Study                        | Location          | Sample size | Common endoscopy findings | H.pylori positive/prevalence |
|------------------------------|-------------------|-------------|----------------------------|------------------------------|
| Ayana SM et al [12]          | Tanzania          | 130         | Gastritis                  | Gastroesophageal reflux disease | Peptic ulcer disease | 65% (RUT) |
| Adleka S et al [19]          | Kerala            | 530         | Gastritis                  | Duodenitis                   | Esophagitis          | 57.7% (RUT) |
| Jemilohnun AC et al [20]     | Nigeria           | 86          | Gastritis                  | Duodenitis                   | Duodenogastric reflux | 64% (RUT) |
| Mohammed MO [21]             | Iraq              | 100         | Antral gastritis           | Duodenal ulcer               | Atrophic gastritis   | Specific data not available |
| Yuvraj NA [14]               | Chennai, India    | 500         | Gastritis                  | Esophagitis                  | Duodenal ulcer       | Not done |
| Colmer gray IN [22]          | Rural alberta, Canada | 229     | Gastritis                  | Normal                       | Peptic ulcer disease | 12.4% (Histopathology) |
| Faintuch JJ et al [23]       | Sao Paulo, Brazil | 306         | Gastritis                  | Reflux esophagitis           | Normal               | 54% (RUT) |
| Khan N et al [15]            | Peshawar, Pakistan | 50          | Normal                     | Esophagitis                  | Gastric ulcer       | Not done |
| Ndhra S et al [18]           | Jakarta, Indonesia | 148        | Gastritis                  | Gastric ulcer                | Esophagitis          | All cases negative on histopathology |
| Present study                | India             | 439         | Gastritis                  | Normal                       | Esophagitis          | 51.7% (RUT) |
DISCUSSION

Dyspepsia is one of the commonest symptoms presenting to the medicine OPD and has great socio-economic impact. Upper GI symptoms like dyspepsia, heartburn, pain abdomen and hematemesis are some of the common complaints with which patients present to the medical OPD. It impairs the quality of life and adds to the financial burden due to repeated hospital visits and medications. The malignancy detection rate is 1.3% among dyspeptic Asian patients.\(^4\)

Out of the 439 patients under study, males were predominant. Similar study in Peshawar, Pakistan, and Chennai, India, males composed 70% and 57% respectively of the endoscopic patients under study for dyspepsia.\(^{14,15}\) In our study, dyspepsia was the commonest symptom (67.4%) followed by pain abdomen (13.8%). Dyspepsia and pain abdomen were more common in males, while other symptoms including anemia and hematemesis was also more common in males. Dyspeptic symptoms were more common in 31-40 years age group similar to other studies.\(^4\)

Symptoms are not reliable enough to distinguish between functional and organic dyspepsia and is a challenge to the treating physician. Multiple tests like endoscopy, therapeutic trials, H pylori testing, and upper GI radiography, are available for evaluation of dyspepsia, however, the first recommended choice is upper gastrointestinal endoscopy in a patient with dyspeptic symptoms.\(^{4,16}\) The clinical guidelines of the American gastroenterological association recommends immediate endoscopy if alarm symptoms are present, or the patient is >55 years of age.\(^{1,17}\) In Asia Pacific region, a cutoff of 45 years is recommended, however, India specific guidelines are not found.\(^{18}\)

In our study, commonest endoscopic finding was gastritis. Multiple studies have shown similar findings. Gastritis was followed by normal endoscopic findings in our study. Few studies agree with normal findings as being common, however, other studies find esophagitis to be the second most common findings in patients with dyspepsia.\(^{12,14,15,18,20-23}\)

Helicobacter pylori is an important and a common bacterial pathogen infecting the upper GI tract and causes various symptoms due to inflammation of the GI tract. The prevalence of this infection varies worldwide being as low as completely negative to higher than 80 per cent among the population in developing countries.\(^{18,24,25}\) There are often regional differences even with respect to the clinical manifestation of H pylori infection, ranging from iron deficiency anemia in childhood to gastric cancer in the elderly.\(^{25}\) This varied spectrum of clinical symptoms and endoscopic findings is seen even in our study.

In a setting where access to upper GI endoscopy is difficult or unaffordable or if the prevalence is high, it is very important for clinicians to know common causes of dyspepsia and frequency of H. pylori infection to recommend empirical eradication can rather than do nothing at all.\(^{7,12}\) Studies have shown that dyspepsia (commonly caused by H pylori followed by NSAID abuse) is a common upper GI indication for endoscopy.\(^{12,14}\) Our study also shows that of all the patients undergoing UGI endoscopy, dyspepsia was the commonest symptom and more than 50% of patients were H pylori positive.

In Asia, the studies published over the last year showed high prevalence rates of H. pylori infection ranging from 54% to 76%.\(^{26}\) Studies from India show that the prevalence of H pylori is as high as 80%.\(^{25}\) However, a study from Kerala has showed a prevalence of 62%.\(^{19}\) Our study showed a prevalence of 51.7% which is lower than most studies. This correlates with a study from Pune where the investigators found a prevalence of 51%.\(^{27}\) The lower prevalence in our study could be because of prior Proton Pump Inhibitor (PPI) medication use, which are well known to be bacteriostatic and could lead to false negative H pylori test results. Hence, it is advisable to stop PPIs 2-4 weeks before endoscopy.\(^{28,29}\) Although this is the recommendation, in practice this can sometimes be a practical
impossibility since symptomatic patients are not compliant with stopping treatment prior to endoscopy. Patients also self prescribe these drugs to reduce symptoms as has been observed in other studies.\(^{(13)}\) Almost all our dyspeptic patients would have received empirical PPIs prior to endoscopy. When the patients don’t respond to empirical therapy, they are subjected to endoscopy.

Studies have shown that, in adults there is no correlation between H pylori infection and the patient’s age or gender.\(^{(30)}\) Our study also showed that the prevalence was similar in patients between the ages of 30 and 70 years. It was significantly low in the younger and older age groups.

Although histopathology is the gold standard for detection of H pylori, it has been seen that RUT is a highly specific, rapid and simple method with low cost. The time needed for obtaining the results ranges from few minutes to 24 hr, depending on the bacterial density in the biopsy and their urease activity. Commercial RUT kits have the sensitivity of 85-90% and specificity >95-100%.\(^{(29)}\) Since commercially available RUT kits are cheaper than histopathology and also faster in terms of generating results, it is was the preferred method of diagnosis in our setting which caters to mainly middle and low socioeconomic strata of the population.

Although the number of patients with CA stomach was less in our study (8 pts.), 7 out of 8 patients were H pylori positive which showed a statistically significant correlation. Several studies have shown clearly that H. pylori infection significantly increases gastric cancer risk.\(^{(31,32)}\) Uemura et al. reported that gastric cancer developed in approximately 3% of H. pylori-infected patients, compared to the uninfected patients.\(^{(31,32)}\) Malignancies in our study were seen in the elderly and we recommend that in elderly patients with dyspeptic symptoms, endoscopy should be mandatory.

Recent studies suggest that eradication rates achieved by first-line treatment with a proton pump inhibitor (PPI), clarithromycin, and amoxicillin have decreased to 70-85%. The most commonly used salvage regimen in patients with persistent H. pylori is bismuth quadruple therapy. Recent data suggest that the combination of a PPI, levofloxacin, and amoxicillin for 10 days is more effective and better tolerated than bismuth quadruple therapy for persistent H. pylori infection, though this needs to be studied further.\(^{(33)}\)

**CONCLUSION**

India with its ever increasing elderly population and high prevalence of H pylori and dyspeptic symptoms patients urgently needs guidelines for empiric H pylori treatment. Gastroenterologists are few in number and endoscopy is a costly and time consuming procedure and needs to be triaged based on age, significant and alarming symptoms. H pylori eradication should be high on the agenda as it is the commonest cause of dyspeptic symptoms which is causing huge socio-economic burden. The authors strongly urge for a larger study to frame appropriate guidelines for endoscopy and empirical treatment of dyspepsia.

**ACKNOWLEDGEMENTS**

Dr. Jayasree PK and Dr. Abdul Jaleel, senior residents, Department of Medicine, DM Wayanad institute of medical sciences, Wayanad And Tinku Thomas and Arun Gopi for statistics.

**REFERENCES**

1. Shaukat A, Want A, Acosta RD, Bruining DH, Chandrasekhara V, Chathadi KV, et al. The role of endoscopy in dyspepsia. ASGE standards of practice committee. Gastrointest Endosc. 2015;82(2):227-32.
2. Talley NJ, Vakil N. Guidelines for the management of dyspepsia. Am J Gastroenterol. 2005;100(10):2324-37.
3. Bytzer P, Talley NJ. Dyspepsia. Ann Intern Med. 2001;134:815-22.
4. Chen SL, Gwee KA, Lee JS, Miwa H, Suzuki H, Guo P, et al. Systematic review with meta-analysis: prompt endoscopy as the initial management strategy for uninvestigated dyspepsia in Asia. Aliment Pharmacol Ther. 2015;41(3):239-52.

5. Shrestha R, Koirala K, Raj KC, Batajoo KH. Helicobacter pylori infection among patients with upper gastrointestinal symptoms: prevalence and relation to endoscopy diagnosis and histopathology. J Family Med Prim Care. 2014;3(2):154-8.

6. Oling M, Odongo J, Kitiuka O, Galukande M. Prevalence of Helicobacter pylori in dyspeptic patients at a tertiary hospital in low resource setting. BMC Res Notes. 2015;23(8):256.

7. Jemilohun AC, Fadare JO. Dyspepsia management in a resource poor setting. Ann Ib Postgrad Med. 2013;11(1):2-6.

8. El-Serag HB, Talley NJ. Health-related quality of life in functional dyspepsia. Aliment Pharmacol Ther. 2003;18(4):387-93.

9. Agreus L, Borgquist L. The cost of gastro-oesophageal reflux disease, dyspepsia and peptic ulcer disease in Sweden. Pharmacoeconomics 2002;20(5):347-55.

10. Vogiatzi P, Cassone M, Luzzi I, Lucchetti C, Otvos L Jr, Giordano A. J Cell Biochem. 2007;102(2):264-73.

11. Bruce MG, Maaroos HI. Epidemiology of Helicobacter pylori infection. Helicobacter 2008;13(Suppl 1):1-6.

12. Ayana SM, Swai B, Maro VP, Kibiki GS. Upper gastrointestinal endoscopic findings and prevalence of Helicobacter pylori infection among adult patients with dyspepsia in northern Tanzania. Tanzan J Health Res. 2014;16(1):16-22.

13. Malfartheiner P, Megraud F, O’Morain CA, Atherton J, Axon ATR, Bazzoli F, et al. Management of Helicobacter pylori infection – the Maastricht IV/ Florence Consensus Report. Gut. 2012;61:646-64.

14. Yuvaraj NA, Vengadakrishnan K. Outcome of Index upper gastrointestinal endoscopy in patients presenting with dyspepsia in a tertiary care hospital. International journal of scientific study 2015;2(11):106-11.

15. Khan N, Shabbir G, Zarif M, Khattak MI. Upper gastrointestinal endoscopic assessment of patients presenting with dyspepsia. JPMI. 2007;21(3):212-6.

16. Talley NJ, Ford AC. Functional dyspepsia. N Engl J Med. 2015;373(19):1853-63.

17. Lee H, Jung HK, Huh KC. Current status of functional dyspepsia in Korea. Korean J Intern Med. 2014;29(2):156-65.

18. Ndraha S, Simadibrata M. Upper gastrointestinal endoscopic and histopathological findings in patients with dyspepsia. The Indonesian Journal of Gastroenterology, Hepatology and digestive Endoscopy 2013;13(1):23-8.

19. Adleka S, Chadha T, Krishnan P, Sumangala B. Prevalence of helicobacter pylori infection among patients undergoing upper gastrointestinal endoscopy in medical college hospital in Kerala, India. Ann Med Health Sci Res. 2013;3(4):559-63.

20. Jemilohun AC, Otegbayo JA, Ola SO, Oluwasola OA, Akere A. Prevalence of helicobacter pylori among Nigerian patients with dyspepsia in Ibadan. Pan African Medical Journal 2011;6:18.

21. Mohammed MO. Correlation of endoscopic findings with various helicobacter pylori tests among dyspeptic patients. International journal of clinical medicine 2014;5:1180-8.

22. Colmers-Gray IN, Vandermeer B, Greidanus RI, Kolber MR. Helicobacter pylori status among patients undergoing gastroscopy in rural northern Alberta. Can Fam Physician. 2016;62(9):e547-e554.

23. Faintuch JJ, Silva FM, Navarro-Rodriguez T, Barbuti RC, Hashimoto CL, Rossini
AR, et al. Endoscopic findings in uninvestigated dyspepsia. BMC Gastroenterol. 2014;14:19.

24. Axon A, Forman D. Helicobacter gastroduodenitis: a serious infectious disease. BMJ. 1997;314(7092):1430-1.

25. Thirumurthi S, Graham DY. Helicobacter pylori infection in India from a western perspective. Indian J Med Res. 2012;136(4):549-62.

26. Eusebi LH, Zagari RM, Bazzoli F. Epidemiology of Helicobacter pylori infection. Helicobacter 2014;19(Suppl 1):1-5.

27. Mhaskar RS, Ricardo I, Azliyati A, Laxminarayan R, Amol B, Santhosh W, et al. Assessment of risk factors of Helicobacter pylori infection and peptic ulcer disease. J Glob Infect Dis. 2013;5(2):60-7.

28. Kodama M, Murakami K, Okimoto T, Fukuda Y, Shimoyama T, Okuda M, et al. Influence of proton pump inhibitor treatment on Helicobacter pylori stool antigen test. World J Gastroenterol. 2012;18(1):44-8.

29. Siavoshi F, Saniee P, Khalili-Samani S, Hosseini F, Malakutikhah F, Mamivand M, et al. Evaluation of methods for H. pylori detection in PPI consumption using culture, rapid urease test and smear examination. Ann Transl Med. 2015;3(1):11.

30. Petrovic M, Artiko V, Novosel S, Ille T, Sobic-Saranovic D, Pavlovic S, et al. Relationship between Helicobacter pylori infection estimated by 14C-urea breath test and gender, blood groups and Rhesus factor. Hell J Nucl Med. 2011;14(1):21-4.

31. Uemura N, Okamoto S, Yamamoto S, Matsumura N, Yamaguchi S, Yamakido M, et al. Helicobacter pylori infection and the development of gastric cancer. N Engl J Med. 2001;345(11):784-9.

32. Wroblewski LE, Peek RM Jr, Wilson KT. Helicobacter pylori and gastric cancer: Factors that modulate disease risk. Clin Microbiol Rev. 2010;23(4):713-39.

33. Chey WD, Wong BC. American college of gastroenterology guideline on the management of Helicobacter pylori infection. Am J Gastroenterol. 2007;102(8):1808-25.