# STUDY ON PREVALENCE OF H. PYLORI INFECTION DETECTED BY RAPID UREASE TEST IN PATIENTS WITH DYSPEPSIA

*Mahesh Dhotre[1], Gautam Ingale[2]*

[1]*Assistant Professor, Department of General Surgery, Sambhram Medical College, KGF, Karnataka.*
[2]*Assistant Professor, Department of General Surgery, Bharathi Vidhyapeeth Medical College, Sangli, Maharashtra.*

## ABSTRACT

### BACKGROUND
The study of gastric bacteriology gained significant impetus after the isolation of Helicobacter pylori in 1983. For nearly 45 years prior to that, gastric spiral bacteria was repeatedly observed and then forgotten, many studies show a consistent association between H. pylori and many common disorders of upper gastrointestinal tract. But until now the cause and effect relationship between H. pylori and acid-peptic disease is not been proven. The aim is to clinically diagnose the prevalence of H. pylori in patients of dyspepsia.

### MATERIALS AND METHODS
80 cases of dyspepsia were studied clinically as per then proforma over a period of two years from July 2012 to June 2013. They are subjected to upper gastrointestinal endoscopy under topical anaesthesia, during which, 3 biopsies from the pyloric antrum were taken. Biopsy specimens were immediately inoculated into the rapid urease test kit, containing phenol red as the indicator. Positive test for Helicobacter pylori was indicated by the change in the colour of the medium from yellow to pink or red observed over 2 to 24 hrs.

### RESULTS
Out of 80 patients, there were 54(67.50%) male patients and 26 (32.50%) female patients, age ranging from 15 to 80 years (49±14.8). Out of 80 patients, 44 were diagnosed to be having Helicobacter pylori (55%). All 6 patients with peptic ulcer were infected with Helicobacter pylori (100%). All 5 patients with duodenal ulcers were infected with Helicobacter pylori (100%) and out of 44 patients with gastritis 20 were positive for H. pylori (45.5%). Out of 13 patients with duodenitis, 11 were positive for H. pylori (84.6%). None of patients with gastric cancers were found. In our study most common complaint of patient was pain abdomen (68 patients) followed by nausea/vomiting and bloating. There is significant relationship between H. pylori bacteria and duodenal ulcer and gastric ulcer.

### CONCLUSION
In this study, we found that patients who underwent upper GI endoscopy for dyspepsia have significant relation between Helicobacter pylori infection and findings like duodenitis (=0.001), duodenal ulcer (p=0.001) and gastric ulcer (p=0.001). It has been observed that males (67.3%) are most commonly infected by H. pylori compared to female (32.7%) patients. It has also been observed that our study is comparable to other studies done. Thus, we conclude that H. pylori may have a role in the aetiopathogenesis of peptic ulcer disease. Hence, we recommend the eradication of bacteria in patients, positive for the bacterium, who have peptic ulcer disease.

### KEYWORDS
Dyspepsia, Acid-Peptic Disease, Helicobacter pylori, Rapid Urease Test, Peptic Ulcer, Non-Ulcer Dyspepsia.

## BACKGROUND
It has been known for more than a century that bacteria are present in the human stomach.[1] These bacteria, however were thought to be contaminants from digested food rather than true gastric colonizers. About 20 years ago, Barry Marshall and Robin Warren described the successful isolation and culture of a spiral bacterial species, later known as Helicobacter pylori,[2] from the human stomach. Self-ingestion experiments by Marshall[3] and Morris[4] and later experiments with volunteers[5] demonstrated that these bacteria can colonize the human stomach, there by inducing inflammation of the gastric mucosa. Marshall developed a transient gastritis after ingestion of H. pylori; the case described by Morris developed into a more persistent gastritis, which resolved after sequential therapy, which showed that gastric colonization with H. pylori can lead to variety of upper gastrointestinal disorders. Several studied have revealed the association of H. pylori in 70-75% patients

with dyspepsia. Endoscopic studies have shown that, H. pylori is found in 80-100% of patients with duodenal ulcers and 60-75% of with gastric ulcers.[6] Amidst these profound variations proposed by many workers in the previous studies, we have attempted to study the prevalence of H. pylori in patients undergoing upper gastrointestinal endoscopy at our hospital, in patients came with dyspepsia by Rapid Urease test.

## Aims and Objectives
- To diagnose patients with Dyspepsia.
- To know the prevalence of H. pylori in patients with dyspepsia.
- To know the prevalence of H. pylori in different clinical diagnosis.

## MATERIALS AND METHODS
Patients who have come to our surgery O.P.D with dyspepsia are selected for this study. Total 80 cases of dyspepsia were selected who fulfilled our inclusion criteria. Then after clinical examination all 80 patients underwent upper GI endoscopy, their clinical history and examination findings are written as per the proforma over a period of two years from July 2011 to June 25, 2018.

## Inclusion Criteria
- Patients with the age group between 15-80 years.
- Patients showing symptoms of dyspepsia.

## Exclusion Criteria
- Patients below 15 years and above 80 years.
- Pregnant and lactating women.
- Patients on proton pump inhibitors.
- Patients with chronic pancreatitis.
- Patients on NSAIDs for more than 1 month
- Patients who have received anti H.PYLORI treatment.
- Patients with bleeding disorders
- Unwilling or unfit patients for gastroscopy.



**Figure 1. Fujinon 201 F Series Fiber Optic Endoscope**
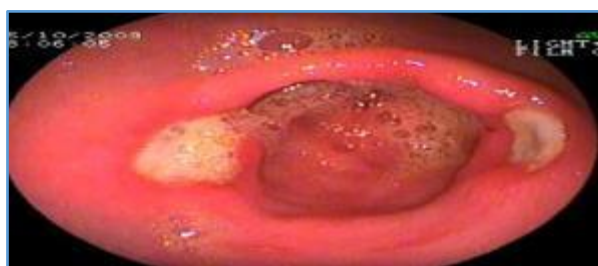


**Figure 2. Endoscopic View of Gastric Ulcer**
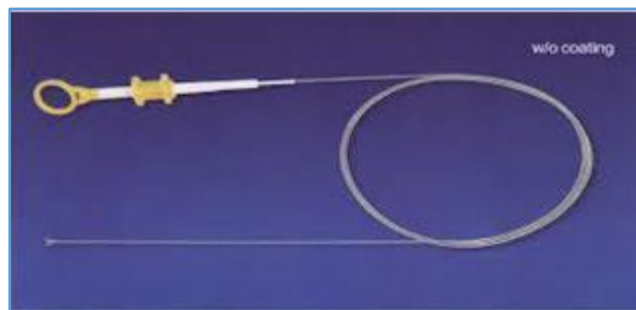


**Figure 3. Endoscopic Biopsy Forceps**



**Figure 4. Tips of Endoscopic Biopsy Forceps**



**Figure 5. Rapid Urease Test Kit**

## RESULTS
Out of 80 patients, there were 54(67.50%) male patients and 26(32.50%) female patients, age ranging from 15 to 80 years. Out of 80 patients, 44 were diagnosed to be having Helicobacter pylori (55%).

| Gender | Male | Female |
|---|---|---|
| Total Number | 54 | 26 |
| Percentage (%) | 67.5% | 33.5% |
| *Table 1. Percentage of Gender in Study Group* | | |

| Age (yrs.) | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | Mean age |
|---|---|---|---|---|---|---|---|---|
| Total | 9 | 18 | 16 | 24 | 9 | 3 | 1 | |
| H.PYLORI +ve | 5 | 11 | 11 | 12 | 3 | 1 | 1 | 49.5 |
| % | 11.25 | 22.50 | 20 | 30 | 11.25 | 3.75 | 1.25 | |

**Table 2. Positivity of Helicobacter pylori based on Age Group**

| | NO | Male | Female | P |
|---|---|---|---|---|
| Total No | 80 | 54 | 26 | |
| H. Pylori +ve | 44 | 34 | 10 | 0.001(S) |
| H. Pylori -ve | 36 | 20 | 16 | |
| % | 55% | 63% | 37% | |

**Table 3. Sex Wise Distribution of Helicobacter pylori**

| Symptoms | Males | Females | Z | P | |
|---|---|---|---|---|---|
| Normal | 3.8 | 0.0 | 1.43 | 0.15 | NS |
| Gastritis | 32.7 | 10.7 | 2.51 | 0.01 | S |
| Duodenitis | 15.4 | 10.7 | 0.61 | 0.54 | NS |
| Duodenal ulcer | 7.7 | 3.6 | 0.80 | 0.42 | NS |
| Gastric ulcer | 7.7 | 7.1 | 0.09 | 0.93 | NS |

**Table 5. Endoscopic Diagnosis of Our Study Patients**

| Symptoms | No. of cases |
|---|---|
| Nausea/Vomiting | 61 |
| Bloating | 54 |
| Pain abdomen | 68 |
| Loss of weight and appetite | 10 |
| SIGNS | No. of cases |
| Anaemia | 33 |
| Epigastric tenderness | 50 |
| Mass per abdomen | 1 |

**Table 4. Clinical Presentation of Our Study Patients**

| Diagnosis | Total no. of Cases | H. pylori +ve (n=22) | H. pylori –ve (n=36) | X | *P |
|---|---|---|---|---|---|
| Normal | 12 | 2(16.7) | 10(88.) | - | - |
| Gastritis | 44 | 20(45.5) | 25(54.5) | 3.28 | 0.07 |
| Duodenitis | 13 | 11(84.6) | 2(12.4) | 11.54 | 0.001 |
| Duodenal Ulcer | 5 | 5(100) | 0(0) | 10.1 | 0.001 |
| Gastric ulcer | 6 | 6(100) | 0(0) | 11.25 | 0.001 |

**Table 6. Prevalence of H. pylori Infection in Endoscopic Diagnosis**

## DISCUSSION

After the discovery of Helicobacter pylori by Marshall and warren in 1983, many studies were conducted to confirm the association of H. pylori with acid peptide ulcer disease and gastric carcinoma which has aroused an interest in studying prevalence of H. pylori in patients with above symptoms.

Thus, we at the Department of Surgery, JJM Medical College, Davanagere have made sincere attempt to explore the possibility of proving this association between H. pylori and ulcer dyspepsia and its contributions to non-ulcer dyspepsia. Here this study also has been compared with other studies done previously. A brief outline of the studies compared is given below.

Marshall and warren[7] (1984) observed that 18 out of 22 (81%) patients with gastric ulcer and all the 13(100%) patients with duodenal ulcers were positive for H. pylori. In 59 patients with gastritis or duodenitis, 32 were positive for H. pylori (54.7%). In patients with normal upper GI endoscopy 8 out of 16 (50%) were positive for H. pylori.

They, Ali Tumi, Salah Elfegy, et al,[8] studied 99 patients between May and October 2000, 53(53.5%) males and 46(46.5%) females. The mean ±SD age was 38±16 years.

The main presenting symptoms were epigastric pain, nausea and/or vomiting. They found out of 99 patients, Duodenal ulcer (DU) was found in 36(36.4%) patients, gastritis in 32(32.2%) patients, duodenitis in 12/912.1%) patients, and Gastric ulcer (GU) in 6(6.1%) patients. Most of those patients were below the age of 45 years. H. pylori detected by RUT in 80% and 56% of patients with DU and gastritis respectively.

Umid Kumar Shrestha, Arnab Ghosh et al.[9] studied 3357 patients referred for endoscopy, 2820 eligible patients underwent upper gastrointestinal endoscopy with biopsy; H. pylori was considered positive when either of Rapid Urease test (RUT) or histopathology showed positive result.

They found the H. pylori prevalence was 29.4% in overall distribution, 41.1% in gastritis and/or duodenitis, 69.5% in gastric ulcer, 84.7% in duodenal ulcer, 20.8% in gastric polyp and 11.5% in gastric cancer.

The H, pylori infection was significantly associated with gastritis and/or duodenitis (P<0.001); duodenal ulcer (P<0.001).We have tried to compare our study with the above mentioned studies under following headings.

| Study | Male | Female |
|---|---|---|
| Marshall & Warren(1984) | 63 | 37 |
| Ali Tumi et al | 53.5 | 46.5 |
| Umid Kumar Shrestha et al | 54.2 | 46.3 |
| Present study | 67.5 | 32.5 |
| **Table 7. Gender Comparison** | | |

| | | | Shrestha et al | |
|---|---|---|---|---|
| H. pylori +ve | 54.7% | 69.7% | 29.4% | 55% |
| H. pylori -ve | 45.3% | 30.3% | 70.6% | 45% |
| **Table 9. Prevalence of H. pylori in Different Study Groups** | | | | |

| Study | Marshall & Warren (1984) | Ali Tumi et al | Umid Kumar Shrestha et al | Present Study |
|---|---|---|---|---|
| Mean age | 55±10 years | 38±16 years | 46.3±17.6 | 49.5±14.8 |
| **Table 8. Age Distribution in Different Study Groups** | | | | |

In present study, the overall positivity for H. pylori was 44 out of 80 patients (55%). This result was almost similar to results of other studies. In study done by AliTumi, Salah elfegy et al, it was (67.7%) and by Umid Kumar Shrestha et al it was (30%). Again it is more in our study may be because people are more unhygienic in food habits which lead to more infection. The reason given for more prevalence of H. pylori in study of Ali Tumi et al., is poor hygiene and low socio-economic status. So personal hygiene and clean food habits are more important in preventing H. pylori infection.

| Study | Marshall& Warren (1984) | Ali Tumi et al | Umid Kumar | Present Study |
|---|---|---|---|---|

| Endoscopic Findings | Marshall & Warren (1984) | | Ali Tumi et al | | Umid Kumar Shrestha et al | | Present Study | |
|---|---|---|---|---|---|---|---|---|
| | Total Patients | H. pylori +ve (%) | Total Patients | H. pylori +ve (%) | Total Patients | H. pylori +ve (%) | Total Patients | H. pylori +ve (%) |
| Normal study | 16 | 8(50) | 3 | 1(33) | 578 | 15(2.59) | 12 | 2(16.66) |
| Gastritis/Duodenitis | 59 | 32(54.2) | 52 | 34(65.3) | 1690 | 693(41) | 57 | 31(54.3) |
| Duodenal ulcer | 13 | 13(100) | 43 | 34(79) | 59 | 50(84.7) | 5 | 5(100) |
| Gastric ulcer | 22 | 18(81.3) | 1 | 6(6.1) | 82 | 57(69.5) | 6 | 6(100) |
| **Total** | **100** | **58(58)** | **99** | **69(69)** | **2409** | **815(33.83)** | **80** | **44(55)** |
| **Table 10. Prevalence of H. pylori in Different Endoscopic Findings** | | | | | | | | |

The incidence of H. pylori infection in present study with different upper GI endoscopic findings like gastritis/duodenitis, duodenal ulcer and gastric ulcer are 54.4%, 100%, 100% respectively. When compared to study done by Ali Tumi, Salah Elfegy et al H. pylori were detected in gastritis/duodenitis was 65.3% in duodenal ulcer 80% and gastric ulcer 6.1%. Same study by Umid Kumar Shresta et al showed gastritis/duodenitis in 41%, Duodenal ulcer in 84.7% and gastric ulcer in 69.5%.

In case of gastritis 20 out of 44 patients (45.5%) showed positivity for H. pylori. This may be because of the factors which effects in causing gastritis other than the H. pylori. This shows significant relation between two by Chi-square test and is comparable to the other studies. In 80 patients, 44 diagnosed with H. pylori only 11 developed peptic ulcers (25%). The remaining (75%) patients even though harbouring H. pylori did not have peptic ulcer.

Here in our study we can see the most common finding in dyspepsia patients on upper GI endoscopy was gastritis, which was significant as compare to other findings (P-0.001) and most common symptoms were nausea and vomiting (61%), pain abdomen (68%) and bloating (54%).Though the gastritis was most common finding on endoscopy in dyspeptic patients it do not have significant relation with H.

pylori bacteria. It shows that there might be other factors like food habit of patients, alcohol consumption, tobacco chewing and socio-economic status of patients which leads to gastritis.

So this study in our setup has shown almost similar results with previous studies.

**CONCLUSION**

This was a prospective study conducted to determine the role of H. pylori in acid peptic diseases. This study design was based on clinical study and endoscopic biopsy of gastric mucosa (and duodenal mucosa whenever necessary) in 80 patients with a history of dyspepsia. From the present study it is evident that,

- Male patients are most commonly infected by H. pylori bacteria
- The age group of patients diagnosed with H. pylori infection in middle age group ranging from 25-50 years. (Mean age 49.5±14.8)
- H. pylori is consistently associated with peptic ulcer disease than non-ulcer dyspepsia, which is in broad agreement with the study done earlier. Thus, it can be concluded that H. pylori infection may have a role in the aetiopathogenesis of peptic ulcer disease.

- Rapid urease test with a high sensitivity and specificity can be used in the detection of H. pylori as it helps to diagnose and treat patients on O.P.D basis.

We conclude from this study that every patient with symptoms of dyspepsia should be tested for H. pylori infection (by Rapid Urease test) and treat with eradication therapy for H. pylori positive tests.

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