Original Research Article

Prevalence of *Helicobacter pylori* infection by rapid urease test among patients with dyspeptic symptoms who underwent upper gastrointestinal endoscopy in a secondary care hospital

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ABSTRACT

Background: Functional dyspepsia is referred to wide spectrum of upper gastrointestinal symptoms which are nonspecific and without organic pathology of upper gastrointestinal tract, and accounts for >60% of patients undergoing upper gastrointestinal endoscopy. The aim of our study was to determine the prevalence of active *Helicobacter pylori* (*H. pylori*) infection by retrospective review of patient records using only rapid urease test reports which gives us the magnitude of the *H. pylori* prevalence.
Methods: 200 patients who presented with dyspepsia were studied clinically according to the proforma over a period of 18 months from April 2020 to October 2021, Patients underwent upper gastro-intestinal endoscopy under topical anesthesia, and biopsies were taken from the antrum. Biopsy specimens were immediately placed onto rapid urease test kit containing urea and an indicator. Positive test for *H. pylori* was confirmed by the change in color of the medium from yellow to pink or red and when the rapid urease test was positive, patient was considered as *H. pylori* positive.
Results: Out of 200 patients, most commonly affected age group are patients between 18-35years and is more in males than females (48:36), 86 patients were found to be *H. pylori* positive (43%) associated with acid peptic disease and duodenal ulcers, gastric antral ulcers.
Conclusions: *H. pylori* is a potential risk factor of gastric malignancy. After being aware of the prevalence of *H. pylori* by early detection of active *H. pylori* infections, rapid urease test serves only as a rapid screening tool in dyspeptic symptoms of patients with acid peptic disease than all other tests.

Keywords: Prevalence, Dyspepsia, Upper gastrointestinal endoscopy, Helicobacter pylori, Rapid urease test

INTRODUCTION

Dyspepsia comprises of a wide range of symptoms which includes upper abdominal pain, discomfort, nausea, and vomiting, bloating, early satiety. Functional dyspepsia is a wide spectrum of non-specific upper gastrointestinal symptoms in the absence of organic pathology, accounting for 60% of patients attending gastroenterology clinics.[1,2] whereas widely prevalent in approximately 50% of the world's population and more in the developing countries, associated with poor sanitation, poor housing, overcrowding and unhygienic water supplies.[3]

Helicobacter pylori (H. pyroli) is known to have associated with complications such as gastric and duodenal ulcers, gastric lymphoma (mucosa associated lymphoid tumor-MALT lymphoma) and non-cardiac gastric cancer. atrophic gastritis, gastric cancer, idiopathic thrombocytopenic purpura, vitamin B12 deficiency and iron deficiency anemia.

H. pylori infection is present in more than half of the world's population mainly in the developing countries (more than 90%) and is also present in our country ranging from 30-67%.[4] The objective of this study was to know the prevalence of *H. pylori* in patients presenting with dyspepsia undergoing upper gastrointestinal endoscopy.

METHODS

Our study was a cross sectional study which was based on retrospective review of among 200 patient records over a period of one and half years from April 2020 to September 2021 at a secondary care hospital, Chamarajanagar, Karnataka, India. Permission from the institutional ethics committee was obtained for the study.

Inclusion criteria

The study included: patients above 17 years of age; and patients with dyspeptic symptoms for more than 2 weeks.

Exclusion criteria

The study excluded: patients less than 17 years and more than 60 years of age; pregnancy and lactation; patients on treatment with proton-pump inhibitors; patients with chronic pancreatitis; patients on treatment with non-steroidal anti-inflammatory drugs for more than 1 month; patients already treated for *H. pylori* with anti-*H. pylori* drugs or kit; patients with obstructive growth in the esophagus; and patients who are not willing for gastroscopy and unfit patients.

The vital parameters for this study included only the results obtained by taking biopsy by upper gastrointestinal endoscopy and rapid urease test as a testing modality. Other methods being histopathology of biopsy specimen for *H. pylori*, immunochromatography techniques like DiaSpot (one step rapid diagnostic test), results obtained were tabulated and presented using Microsoft excel.

Procedure

All patients in our study group (200) underwent upper gastrointestinal endoscopy under lignocaine spray (topical anaesthesia). The patients were kept nil oral for 12 hours before the procedure. Lignocaine spray was applied to the patient 5-10 minutes before the procedure for the mucosal anaesthetic effect. On passing the scope into the esophagus, growth/mass lesions were looked for. Entering the stomach any ulcers or growth were looked for along the entire stomach. Biliary reflux from the duodenum and gastritis were identified. Acid peptic disease or duodenal ulcers were noted on entering into the 1st and 2nd part of duodenum.

Two endoscopic biopsy fragments of tissues were taken of approximately 2-3 mm each from the body of stomach in the area of severe gastritis (maximum redness) and gastric antrum or from the ulcer edge. In case of normal endoscopic findings random biopsy was taken from the body and antrum of stomach.

Biopsy tissue was immediately placed on to the testing card (rapid urease test) maintaining sterile conditions over the paper containing urea and a color indicator on the card.

Positive test for *H. pylori* was confirmed by the change in color of the medium in the card from yellow to pink or red. This test was interpreted as strongly positive when the color change occurred in 5-15 minutes following the test and weakly positive when the color changes later but in first 6 hours. The patients were identified as *H. pylori* positive when their rapid urease test was positive.

Patients who were positive for rapid urease test were diagnosed to have infection and were advised triple drug regimen (anti *H. pylori* regimen) for 14 days.

Then patients were asked to review a month later to check for relief of their symptoms.

Triple drug regimen for *H. pylori* positive patients are amoxicillin with 1000 mg twice daily, omeprazole with 20 mg twice daily and metronidazole with 400 mg twice daily.

Patients were also instructed to stop the treatment in case of any drug reaction and review immediately for the same. After completion of 14 days treatment, patient information about relief from the earlier symptoms and change of regimen (salvage regimen) if they are not relieved of the symptoms.

RESULTS

In our study, out of 200 patients, there were 132 males and 68 females. 86 patients of the 200 patients were diagnosed to be *H. pylori* positive (43%). most of the patients complained of abdominal discomfort 80%. 58% of the patients had bloating/ postprandial fullness, 50% of patients complained of upper abdominal pain (in the epigastrium).
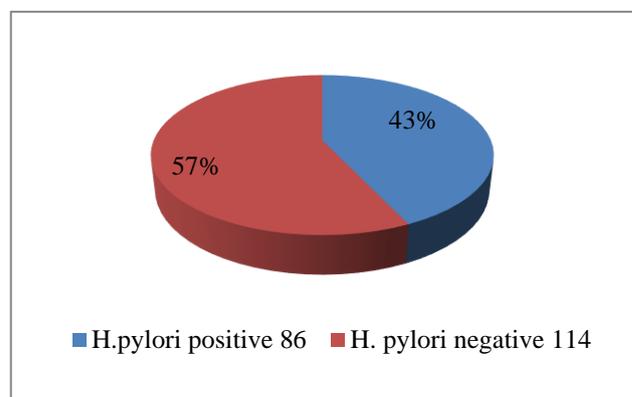

Figure 1: Prevalence of *H. pylori* in the study population.

Out of 86 patients who tested positive for *H. pylori* 48 were males and 38 were females (Figure 2).

Of the 200 patients of the study group patients were categorized into different age groups group I- 18 to 35 years (85 patients) 45 were positive, group II- 36 to 50 years (75 patients) 25 were positive, group III- more than 50 years (40 patients) 16 were positive (Figure 3).

All of the 86 patients were advised to continue anti-*H. pylori* regimen for 14 days as mentioned above of which 75 patients reported relief of their symptoms. Among the remaining 11 patients, 8 of them had symptoms recurred after receiving treatment and 4 of them had not relieved of symptoms.
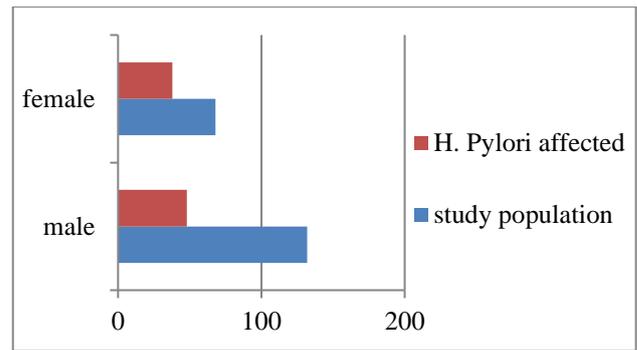

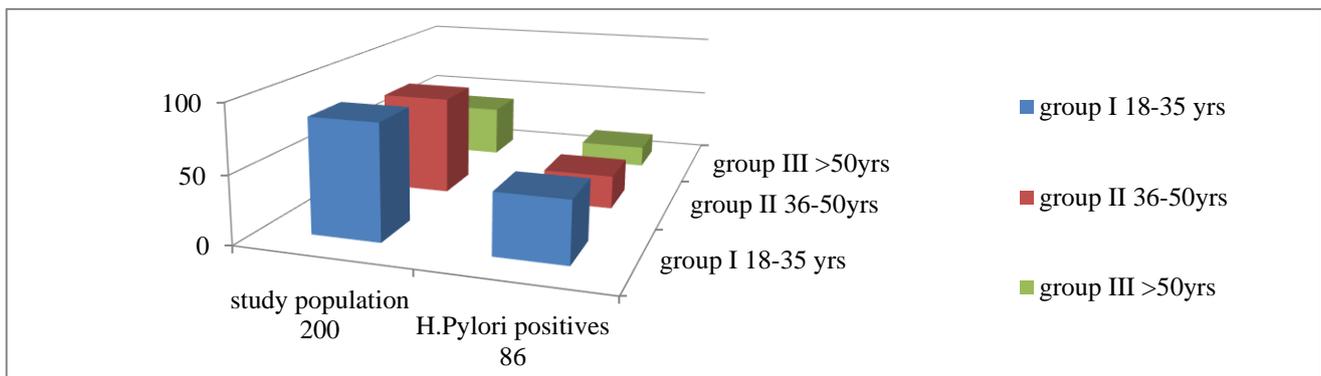**Figure 2: Prevalence of *H. pylori* among males and females of study population.**

Figure 3: *H. pylori* positivity in different age group and study group.

DISCUSSION

This study was done to determine the prevalence of *H. pylori* infection in patients presenting with dyspepsia on upper gastrointestinal endoscopy was found to be 43% using rapid urease test only. *H. pylori* infection was more prevalent in age group of 18 to 35 years and common in males than females.

Present treatment plan for most patients with symptoms of upper GIT comprises of initial endoscopic examination and histopathology. *H. pylori* remains to be the most common causative factor of chronic gastritis. Since *H. pylori* also has carcinogenic effect.

In this study age of the patients with dyspepsia ranged from 17-60 years. Among the patients seeking for medical help due to dyspepsia 132 (76%) were males and 68 (34%) were females with male predominance (M: F-1.94:1). The study done by Sharma et al documented 51% female seeking for medical help due to dyspepsia as compared to 49% males.[5]

Most common upper gastrointestinal endoscopic findings were antral gastritis (18%) and gastritis with esophagitis (18%), duodenal ulcers (16%) and gastroesophageal reflux (9%), when findings were observed in a study done by Poudel et al which showed 58.1% cases with antral gastritis and 11.63% with peptic ulcer.[6] Reflux esophagitis was seen in 9% of our patients which was less than study done by Ercelep et al.[7]

Overall, researchers found a consistent pattern in most developing nations, Nepalese data show that the prevalence of *H. pylori* infection varies widely from 30-67%.[8-13]

Gastric carcinoma was seen in 4 (2%) of cases with 3 (75%) having *H. pylori* infection. The data is too small to compare with other studies.

The results of this study gives us quantitative descriptive analysis of active cases of *H. pylori* infection in the local population and prevalence obtained by this study was almost found to be in accordance with the similar studies performed.[14,15]

When compared with similar studies conducted in other parts of the world, the prevalence of *H. pylori* infection our study group (local population) was found to be lesser than West Indies, but greater than estimates that were obtained in Poland.[16,17]

Limitations

This study was performed retrospectively, hence a randomized controlled trial (prospective specifically) is the best way to proceed.

Rapid urease test is a test for the presence of the urease enzyme hence false positive and false negative reports can alter the efficacy of rapid urease test in estimating the prevalence, hence additional confirmatory tests in the form of histopathology and serological tests are necessary for confirmation as well as serial monitoring for all *H. pylori* affected patients.

CONCLUSION

In a scenario of wide prevalence of *H. pylori* infection in general population, magnitude of this problem requires a quantitative estimation of *H. pylori* infection which is done in this study, *H. pylori* is a potential risk factor of gastric malignancy. After being aware with the prevalence of *H. pylori* by early detection of active *H. pylori* infection rapid urease test was very useful as a quick screening test and was helpful in the better treatment of the patients and also in the monitoring of gastric malignancies among the post infected cases along with other methods like the serial monitoring of the patients and histopathological examination of *H. pylori* related ulcers and gastric mucosa and serological tests are necessary to complete assessment of patients.

REFERENCES

1. Lan L, Yu J, Chen YL, Zhong YL, Zhang H, Jia CH. Symptom- based tendencies of Helicobacter pylori eradication in patients with Functional Dyspepsia. World J Gastroenterolol. 2011;17(27):3242-7.
2. Oshima T, Miwa H. Treatment of functional dyspepsia: where to go and what to do. J Gastroenterol. 2006;41(7):718-9.
3. Hooi JKY, Lai WY, Ng WK, Suen MMY, Underwood FE, Tanyingoh D, et al. Global prevalence of helicobacter pylori infection: systematic review and meta-analysis. Gastroenterol. 2017;153(2):420-9.
4. Mahadeva S, Goh KL. Epidemiology of functional: a global perspective. World J Gastroenterol. 2006;12(17):2661-6.
5. Sharma SK, Maharjan DK, Thapa PB. Hospital based analytic study of peptic ulcer disease in patients with dyspeptic symptoms. Kathmandu Univ Med J. 2009;7:135-8.
6. Poudel A, Regmi S, Poudel S, Joshi P. Correlation between endoscopic and histopathological findings in gastric lesions. J Univ Coll Med Sci. 2013;1:37-41.
7. Ereelep OB, Caglar E, Dobrucali A. The prevalence of gastroesophageal reflux disease among hospital employees. Dis Esophagus. 2014;27:403-8.
8. Lacy BE, Rosemore J. Helicobacter pylori: Ulcers and more: The beginning of an era. J Nutr. 2001;131:27895-935.
9. Rai SK, Shah RD, Bhattachan CL, Rai CK, Ishiyama S, Kurokawa M, et al. Helicobacter pylori associated gastroduodenal problem among the Nepalese. Nepal Med Coll J. 2006;8:9-13.
10. Makaju R, Tamang MD, Sharma Y. Comparative study on a homemade rapid urease test with gastric biopsy for diagnosis of Helicobacter pylori infection. Nepal Med Coll J. 2006;8:97-100.
11. Makaju RK, Tamang MD, Sharma Y, Sharma N, Koju R, Ashraf M. Prevalence of Helicobacter pylori in Dhulikhel Hospital, Kathmandu University Teaching Hospital: A retrospective histopathologic study. Kathmandu Univ Med J. 2005;3:355-9.
12. Khanal S, Rao BS, Sharma Y, Khan GM, Makaju R. Comparative study between two triple therapy regimens on eradication of Helicobacter pylori. Kathmandu Univ J Sci Engg Technol. 2005:1-10.
13. Kawasaki M, Kawasaki T, Ogaki T. Seroprevalence of Helicobacter pylori infection in Nepal: Low prevalence in an isolated rural village. Eur J Gastroenterol Hepatol. 1998;10:47-50.
14. Dutta AK, Reddy VD, Iyer VH, Unnikrishnan LS, Chacko A. Exploring current status of Helicobacter pylori infection in different age groups of patients with dyspepsia. Indian J Gastroenterol. 2017;36(6):509-13.
15. Jeyamani L, Jayarajan J, Leelakrishnan V, Swaminathan M. CagA and VacA genes of Helicobacter pylori and their clinical relevance. Indian J Pathol Microbiol. 2018;61(1):66-9.
16. Whittle DO, Ewing R, Lee MG. The prevalence of Helicobacter pylori infection in patients undergoing upper gastrointestinal endoscopy in the Turks and Caicos Islands. West Indian Med J. 2010;59(3):309-11.
17. Tascikowski T, Bawa S, Gajewska D, Ryciak MJ, Bujko J, Rydzewska G. Current prevalence of Helicobacter pylori infection in patients with dyspepsia treated in Warsaw, Poland. Przegląd Gastroenterol. 2017;12(2):135-9.