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Association of helicobacter pylori with acid peptic disease

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Abstract

Aim: to find out association of H. pylori and acid peptic disease in patients attending Krishna Hospital for symptoms of dyspepsia.

Material and method: Endoscopy was performed with Fujinon-fibre-scope UGI-FP-7 gastroduodenoscope after obtaining informed consent. Endoscopy was done as one of the routine investigation procedure and the samples were sent to the microbiology department for culture and smear examination.

Results: Out of 100 biopsies from symptomatic patients which were subjected to modified Gram's staining H. pylori was demonstrated in 52 patients giving percentage positivity of 52 %. Highest positivity was seen in patients with gastritis and duodenitis. Smear was negative for H. pylori in all 10 controls.

Fontana staining was also done on all biopsy samples. It appears that spiral morphology is better appreciated in Fontana staining as compared to modified Gram's staining.

Conclusion: Rapid urease test appears to be more useful for rapid detection of H.pylori than smear and culture. Fontana's staining although more expensive and time consuming than modified Gram's stain, it stains bacteria well which can be easily detected and spiral morphology of H.pylori is better appreciated.

Keywords: acid peptic disease, dyspepsia, H. pylori

Introduction

Mankind has taken a quantum leap in the acquisition of scientific knowledge in the last 100 years which has suppressed all which it acquired in the previous five millennia. Each decade brings out starting discoveries which shake scientific beliefs to their very foundation and turn the treatment of disease [1]. Upper gastrointestinal diseases form a major part of the total number of patients attending out patient clinic for gastro-intestinal disorders. For many years the treatment of peptic ulcer has been based on Schwartz dictum "No acid, no ulcer". Gastric acid has dominated the approach to the diagnosis and treatment of peptic ulcer disease [2].

The discovery of *Helicobacter pylori* (H. Pylori) and its firm implication in the aetiopathogenesis of peptic ulcer disease marked the major milestone in our understanding of the aetiology of peptic ulcer. *Helicobacter pylori* is found in about 80% of gastric ulcers and more than 95% of duodenal ulcers, indeed the dictum "no acid, no ulcer" might be complemented by a new dictum, "no H. pylori, no duodenal ulcer" The presence of H. pylori can be detected by various invasive and noninvasive tests [3]. Rapid urease test, histology, cytology, culture and polymerase chain reaction are based on biopsy samples and need endoscopy [4]. Noninvasive tests include serology and urea breath tests. Several studies during past 10 years have demonstrated close (association of H. pylori and gastritis and peptic ulcer disease and its possible role in gastric carcinoma. These studies further revealed that eradication of H. pylori dramatically decreases ulcer recurrence, accelerates ulcer healing and prevents bleeding [5]. This prompted us to undertake the present study to find out association of H. pylori and acid peptic disease in patients attending Krishna Hospital for symptoms of dyspepsia [6].

Material and Method

100 patients attending gastroenterology clinic of Krishna Hospital and Medical Research

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Centre for symptoms of dyspepsia during the period May 2009 to Sept 2011 were included in the study. 10 patients undergoing upper gastrointestinal scopy for other reasons like sclerotherapy or follow-up scopy after any surgical intervention were included as controls.

Patients having symptoms of acid peptic disease were advised to attend the gastroscopy clinic. Patients taking anti-inflammatory drugs, antibiotics and bismuth compounds or omeprazole 4 weeks before endoscopy were excluded from study. Patients were kept nil orally at night and were advised to attend endoscopy clinic early in the morning.

Endoscopy was performed with Fujinon-fibre-scope UGI-FP-7 gastroduodenoscope after obtaining informed consent. Endoscopy was done as one of the routine investigation procedure and the samples were sent to the microbiology department for culture and smear examination.

The rapid urease test was done in the endoscopy room. Endoscopic findings were recorded as gastritis, duodenitis, duodenal ulcer, gastric ulcer, esophagitis, gastric carcinoma and endoscopically normal mucosa as per standard criteria. After the stomach and duodenum had been examined visually, biopsies were taken. Three antral biopsies were taken from within five cms of the pylorus which were subjected to rapid urease test, smear examination and culture. The plates were first observed after 72 hours of incubation and then on 5th day and 7th day of incubation. Translucent, small, moist raised colonies on culture plates were first subjected to modified Gram's stain and observed for presence of curved.

Gram negative spiral bacilli. Identification of *H.pylori* was done by using biochemical tests like oxidase, catalase, rapid urease and nitrate. Cultures showing growth of Gram negative spiral organisms which were oxidase, catalase and rapid urease positive and nitrate negative were taken as positive for *H.pylori*.

Results

100 patients attending gastroenterology clinic of Krishna Hospital and Medical Research Centre for symptoms of dyspepsia. 10 patients undergoing upper gastrointestinal scopy for other reasons like sclerotherapy or follow-up scopy after any surgical intervention were included as controls.

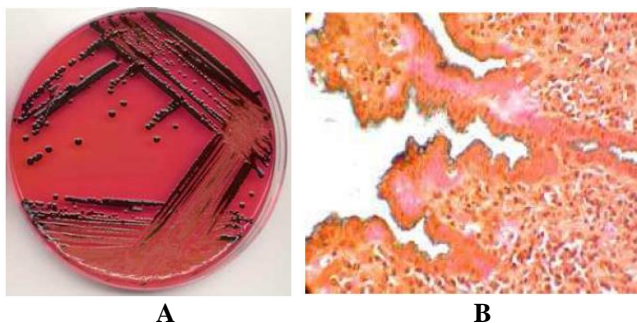


Fig 1: A) *H.pylori* culture; B) *H.pylori* smear

The majority of patients were from age group of 20 to 39 years i.e. 40 patients, next to follow was age group of 40 to 59 years Age group 60 to 79 years was 18 patients, less than 19 years had 8 patients and more than 80 years had 6 patients.

There is male preponderance, 6 control group patients were in the age group of 25 to 70 preponderance 8 males against 66 males against 34 females 2 females.

This table shows classification of patients based on endoscopic findings. 38 patients had gastritis, 30 had duodenitis had gastric ulcer, 2 had duodenal ulcer, 1 had gastric cancer and patients had normal upper GI scopy findings.

Rapid urease test was positive in 84 out of 100 symptomatic patients giving percentage of positivity 84 %. The highest positivity of RUT was seen in patients of gastritis (94.73%) and duodenitis (86.66%) followed by esophagitis (75%). The positivity of RUT in gastric and duodenal ulcer was 66.66% and 100% respectively whereas, patients with normal mucosa having clinical symptoms was 60%. None of the control group gave positive rapid urease test.

Out of 100 biopsies from symptomatic patients which were subjected to modified Gram's staining *H. pylori* was demonstrated in 52 patients giving percentage positivity of 52 %. Highest positivity was seen in patients with gastritis and duodenitis. Smear was negative for *H. pylori* in all 10 controls.

Fontana staining was also done on all biopsy samples. It appears that spiral morphology is better appreciated in Fontana staining as compared to modified Gram's staining.

Discussion

The discovery of *H.pylori* as a gastrointestinal pathogen has had a profound effect on current concept of pathogenesis of peptic ulcer disease. *H.pylori* is the most common infection seen worldwide. Probably human is the only natural host and human to human transmission appears to be via oral-oral route. The dental plaque is an important reservoir of the organism in India, and probably reflects poor hygiene. High prevalence is seen in developing countries, low socio-economic group and family members of infected subjects [7].

During last one decade innumerable studies world over have shown important role of *H.pylori* in acid peptic disease. *H.pylori* causes chronic active gastritis, is associated with duodenal ulcer and possibly plays some role in non-ulcer dyspepsia, gastric lymphoma and adenocarcinoma. Out of various invasive and non-invasive tests used for detection of *H.pylori*, rapid urease test (RUT) smear examination, histology, culture and ELISA test are the most commonly used tests for detection of *H.pylori* infection [8].

Positivity of rapid urease test in acid peptic disease patients was 90% in the study by Nanivadekar et al. They used modified Christensen's urea agar slants for detection of preformed urease. McNulty et al reported that RUT was positive in 75% of patients by using 2% Christensen's urea broth. Vaira et al. 100 used little modification i.e. 2% urea broth at 37°C for 4 hours and got positivity of 31.6%.

Morris et al and Borromeo et al evaluated the CLO test and have demonstrated the positivity of 65.7% and 58.7% respectively [9]. In another large study conducted on 1445 patients by McNulty et al 101 by using Christensen's urea broth and modified biopsy urease test reported positivity of 36.9% and 39.33% respectively. One minute endoscopy room test used by Arvind et al. 99 showed positivity of 47.5% in 40 patients studied.

In our study, we have used modified Gram's stain on crushed biopsy smear. We could detect *H.pylori* in 52 biopsies out of 100 giving percentage of positivity 52%, which correlates well with above studies [10]. Various medias have been used for isolation of *H.pylori*. Culture of endoscopic samples is sensitive and specific, viable bacteria are detected and antibiotic sensitivity can be obtained. However culture takes

several days and results are dependent on expertise of operator and the laboratory. Failure to culture *H.pylori* may also result from sampling errors/delay in plating material. Other factors that interfere with the ability to culture *H.pylori* include swallowed local anaesthetics, semithicone, prior treatment with bismuth, antibiotics or H₂ - receptor antagonists and contamination of biopsy forceps with disinfectants.

In the present study we have used, Columbia Blood Agar Base with sheep blood and Skirrow's supplement (Hi-media). We could isolate *H.pylori* in 16 biopsies out of 100 giving percentage positivity of 16%. Although the samples were processed immediately after collection, lack of technical expertise, overgrowth of contaminants or sometimes use of dry old culture plates may be responsible for low culture positivity in the present study.

Conclusion

Evidence for *H.pylori* infection was maximum in patients of duodenal ulcer, duodenitis followed by gastritis then endoscopically normal mucosa followed by esophagitis and then gastric ulcer. Rapid urease test appears to be more useful for rapid detection of *H.pylori* than smear and culture. Fontana's staining although more expensive and time consuming than modified Gram's stain, it stains bacteria well which can be easily detected and spiral morphology of *H.pylori* is better appreciated.

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