



Research Article

HELICOBACTER PYLORI –A POWERFUL RISK FACTOR IN PERFORATING THE PEPTIC ULCER DISEASE

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ABSTRACT

Introduction: Peptic ulcer disease, a common disease encountered in surgical practice. Relationship between the peptic ulcer and *H. pylori* is well established, but not clear with its major complications viz gastro duodenal perforation and bleeding. **Aim:** To find out the prevalence of *H. pylori* in perforated peptic ulcer disease patients. **Methodology:** All patients with perforated peptic ulcer who undergone emergency laparotomy were studied. Biopsies were taken from perforation margin and sent for detecting for *H. pylori*. **Results:** The study population ranged from 13 to 80 years of age with sex ratio of 6:1. Among 50 patients studied (n=32)64% of patients were positive for *H. pylori*. Among the 32 patients positive for *H. pylori*, 53% had previous history of dyspepsia. **Conclusion:** Hence treating these patients with *H. pylori* eradication therapy post-operatively, we can reduce the recurrence, re-perforation and ensure rapid healing of peptic ulcer.

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INTRODUCTION

Peptic ulcer disease is a common disease that is usually encountered in surgical practice. Peptic ulcer is defined as erosion in the gastric or duodenal mucosae that extend through the muscularis mucosa.¹ One of the major devastating and challenging complication of peptic ulcer disease is perforation of duodenal/gastric ulcer, which is managed by an emergency procedure of omental patch closure of perforation. The stomach and duodenum are exposed to quite a few possibly irritating materials including the gastric acidity (Hcl), alcohol, spicy food and tobacco. Peptic ulcers were believed to be caused by stress, dietary factors and increased gastric acid secretion till as late as 1983, when Warren and Marshall discovered the association between the Helicobacter pylori and peptic ulcers². Relationship between the peptic ulcer and *H. pylori* is now well established, but it is not clear with its major complication like gastro duodenal perforations.

Aim and objective

To detect the prevalence of the helicobacter pylori infection in the perforated peptic ulcer disease (Duodenal and Gastric) in patients treated in RMMCH using Giemsa staining, tissue culture and Rapid Urease Test.

MATERIAL AND METHODOLOGY

This is a Prospective non-blinded study, conducted on 50 patients who attended the RMMCH casualty, with acute abdomen pain and diagnosed to have hollow viscous perforation (figure:1) were included in this study after obtaining proper informed written consent. The patients with perforation of malignant or traumatic cause were excluded from the study. The subjects were selected without any predisposition, whoever first fulfilled the criteria were taken as case no:1 and so on. Their demographic data and intra operative findings were documented.

These patients underwent emergency laparotomy, biopsies were taken from the margins of the perforation site and were subjected to RUT test in operating room itself and the other samples were sent for tissue culture and microscopy through appropriate transport media without any delay. The perforation will be closed with Graham's omental patch and good quantity of peritoneal wash and is given.

The biopsies specimens were grinded and smeared for Giemsa staining and inoculated in Skirrow's campylobacter medium and Chocolate agar for culture the inferences were noted as in Table: 1.

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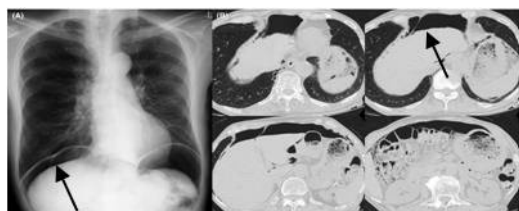


Figure 1 Radiological Investigation Showing Air Under Diaphragm

Table 1 Various Test and Their Inferences

Test	Specimen	Transport media	Definite media	Observation	Inference
Rapid Urease Test	Tissue Biopsy	Nil	RUT (Urea) Broth	Colour change (Yellow to Pink) deep purple	H. Pylori Positive
Microscopy	Tissue Biopsy	Normal Saline	Giemsa Stain	with the typical gull wing shaped bacilli.	H. Pylori Positive
Tissue Culture	Tissue Biopsy	Cold Saline	1. Skirrow's Media 2. Chocolate Agar	small, translucent circular colonies	H. Pylori Positive

Patients with microscopy or culture positive were considered as positive for *H. pylori*. Other risk factors were also studied along with the *H. pylori* to find if any co-relation exist.

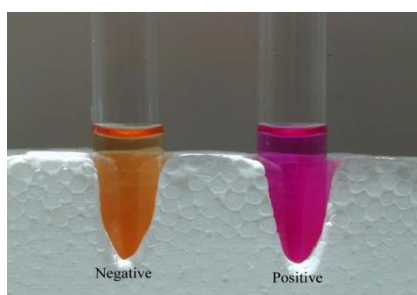


Figure 2 Rapid Urease Test

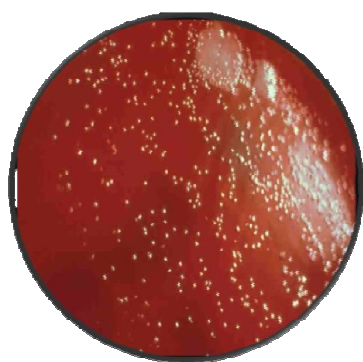


Figure 3 *H. pylori* growth in Chocolate agar

OBSERVATION AND RESULTS

In this study among 50 patients, age of the patients ranged from 13 to 80 years with the mean age of 49 years. Main cluster of subjects (40%) was between 40 – 60 years (figure: 2). And *H. pylori* was maximum seen in 3rd decade of life of about 85.7%. Both male and female were included in the study with ratio of 6:1 (figure: 3) without any predispositions. Most of the patients were categorized as lower middle class according to Modified Kuppusamy classification of socioeconomic status. More patients belonging to lower and upper lower class were infected with *H. pylori*.

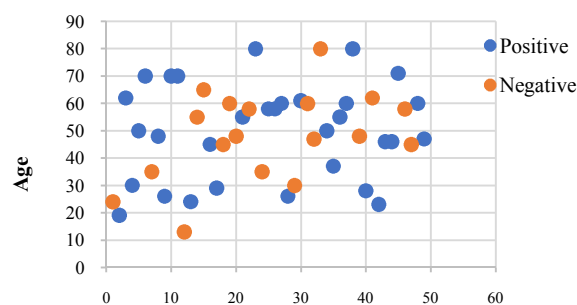


Figure 4 Age Wise Distribution

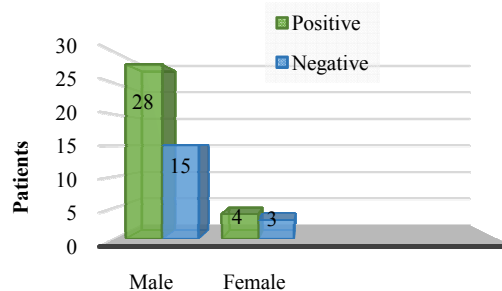


Figure 5 Gender Wise Distribution

Other lifestyle risk factors were tabulated in Table: 2., of which stressful nature of job and intake of spicy food were predominant risk in this study of about more than 70% of patients. Followed which the additive effect of smoking and tobacco showed second major risk factor more than 64%.

Table 2 Life style risk factor

Risk Factors	Number	Percentage	
Nature of job	Stressful	38	76%
	Non-Stressful	12	24%
Food habits	Non-Spicy	7	14%
	Spicy	37	74%
Alcoholic	Yes	30	60%
	No	20	40%
Tobacco User	Yes	30	60%
	No	20	40%
Past Medical History	NSAID	22	44%
	Steroids	11	22%
	Anti-Platelet drugs	13	26%
	Anti-Cancer drugs	1	2%
Blood Group	A Group	22	44%
	B Group	10	20%
	O Group	15	30%
	AB Group	3	6%
H/O UGI complaints	Yes	24	48%
	No	26	52%
H/O use of PPI/H2B	Yes	35	70%
	No	15	30%

Helicobacter Pylori

The prevalence of *H. pylori* testing was done using Rapid urease test, Microscopy using Giemsa staining and Culture using the Skirrow's campylobacter medium or Chocolate medium. The results were depicted in the figure: 6.

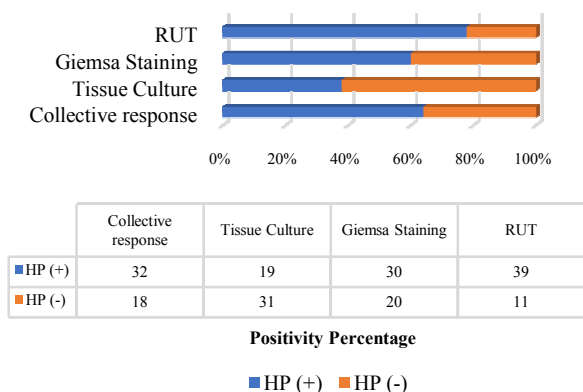


Figure 6 Showing *H. pylori* positivity in various test

DISCUSSION

The most common illnesses that affect the stomach and duodenum are Peptic ulcer disease. The role of *H. pylori* in the aetiopathogenesis of peptic ulcer has now been clearly established and the symptoms are made worse by excessive stomach acid. The role of the *Helicobacter pylori* was just understood in the early 1980s². The patients infected with *H. pylori* may suffer from chronic dyspepsia, gastritis, peptic ulcer, gastric malignancy and sometimes with life threatening perforated peptic ulcer.

Age Though the age group of patients who presented themselves with the gastroduodenal perforation ranged from 13 to 80 years. Like other studies in Indian population, most of them were in middle aged group (40 to 59years) with an average age of 49 years. But still this age group was slightly higher when compared with the study conducted by Dogra *et al*⁵, with the highest incidence in the age group of 31-40 years.

Gender The female patients with perforated peptic ulcer are less when compared to male patients. The male female ratio was found to be 6:1 in our study. Total females who had perforation was 14% in our study. Perforation is more common in males than females, may be due the great difference in habit, social, economic, cultural activities and stress. Female sex hormone offers some security against perforation as claimed by Skovgaard (1997)⁴.

Socioeconomic status Patients with varied socio-economic status underwent emergency laparotomy for gastro-duodenal perforation, among which most (46%) of them belongs to lower middle class and lower class (26%). This data is slightly varying with other studies which had the maximum junk of patients were in lower class.

Nature of the job In this study, (n=38)76% of patients had a stressful job (as told by the patient) and remaining (n=12)24% people had a non-stressful job. Though the people with same occupation addressed their job in different ways and perceived it in different way (stressful or non-stressful). The stress is subjective to individuals and based on the Type of personality of people, Passion towards the job and not due to the occupation. May be that is why many studies have not analysed the Nature of job (Stressful or not stressful) as a risk factor of the perforation of gastroduodenal disease. But this factor had definitely contributed to disease prevalence. Stress may be a confounding factor in the *H. pylori* infection by suppressing the nature defence mechanism.

Food Habit Out of the 50 study subjects in this study 37 (74%) patients had the habit of taking spicy food and 7 (14%) patients are used to take food less spicy. Again, this is a subjective data, described by the patient's own language. Similar to this study, 2 more studies one from Chhattisgarh region by Sharma *et al*⁵ and other one by Syed abbas *et al*⁶ also had a high prevalence of perforated peptic ulcer in people who ingest spicy food. To the awakening, among the people who don't take spicy food had 71.4% positive for *H. pylori* reasoning for the cause of gastroduodenal perforation. Hence food habit is not an isolated contributory risk factor for perforation which could not be elicited in this study.

Alcohol Usage Alcohol abuse is a universal risk factor for many medical and surgical diseases. Its importance in the aetiopathogenesis of peptic ulcer and its perforation is high because of its nature of addiction, eroding the alimentary canal mucosa, suppressing the host immune responses. In this study the more than 60% of people had consumed alcohol one or two days before presenting. And on probing them with further leading questions to find their duration of alcohol usage, it was found most of them were using alcohol for a mean duration of 6.2 years and as most of them were farmers and daily wagers.

Similar to this study many other studies by Valooran *et al*⁷, Binni John *et al*⁸, and Sebastian *et al*⁹ also had more than 68% of study participants as alcoholic. And positivity for *H. pylori* among the alcoholics being more than 60% in this study and other studies also.

Tobacco Usage

Similar to Alcohol, tobacco usage in various forms has been a major risk factor for many surgical disease especially oncological and vascular diseases. Peptic ulcer perforation is also not less common disease influenced by tobacco. Though cigarette and beedi is commonly used by men, women chew tobacco more frequently than men in this study (85% of female and 23% of male). In Current study 60% of total patients had used tobacco in one or other form. Which is again a huge proportion similar to the study by Ng *et al*¹⁰. and Dogra *et al*³.

The additive effect of alcohol and tobacco usage is very high in this study population. More than 80% of the alcoholics used tobacco and more than 90% of tobacco users used alcohol. Even without any other risk factors this combination of alcohol and tobacco itself is potent of causing gastroduodenal perforation.

Past medical history: Our people have the habit of getting drugs over the counter for various body aches, and use it abusively. Even in our study many patients had a past history of abusing drugs like Non-Steroidal anti-inflammatory drugs (more than 44%), steroids (more than 22%), Anti-platelet drugs like Aspirin in CAD/ CVA patients (more than 26%) without any medical knowledge or with compliance in following doctor's advice. In this study there had been people abusing more than one group of drugs, but for the convenient study purpose the drug with longer duration is taken into account. Apart from these drugs one patient had used anti-cancer drugs.

Other studies also demonstrated the use of NSAIDs and Steroids had the maximum influence in perforated peptic

ulcer disease, similar to our study. On analyses, the use of these drugs had no significant change in causing or preventing the infection of *Helicobacter pylori*.

Upper Gastro Intestinal Symptoms: 48% of the total study population had a previous history upper Gastro intestinal complaints like dyspepsia, hematemesis, regurgitation and epigastric pain. This proportion is less when compared to the other studies conducted by the Zahid *et al.*¹¹, Babar Rehmani *et al.*¹², and Dogra *Et al.*³. which was 62%, 78% and 59% respectively. Among the patients with the Previous history of UGI symptoms, more than 70% were *H. pylori* positive, which is again homologous with the other studies.

Blood group:As a routine investigation for every patient undergoing major surgery blood grouping and typing was done. On correlating the prevalence of blood group with perforative disease, our study patients had predominantly “A group” (44%). This blood group had highest chance in lodging the *H. pylori* in body parts like duodenal and gastric mucosa, salaiva and dental plaques. In our study among the 32 patients with *H. pylori* positive, 15 cases (approx.50%) were “A group”. This finding consistent with the other studies.

Helicobacter pylori

In the current study, the frequency of *H. pylori* was found to be 64% among the 50 participants; showing high incidence of *H. pylori* in the perforated peptic ulcer. These results are on par with the other studies like Sebastian *et al.*⁹, Ng *et al.*¹⁰, and Sharma *et al.*⁵. reported an infectious rate as high as 83%, 70% and 61% respectively. And this is in contrast with Dinesh k *et al.*, Chowdary *et al*, and Reinbach *et al.*¹³ were 2.2%, 0% and 47% respectively.

Table 3 Variuos Studies and Their Positivity

Author	Year	Sample size	<i>H. pylori</i> positive %
Reinbach, <i>et al.</i> ¹³	1993	80	47%
Ng <i>et al.</i> ¹⁰	1996	73	70%
Chu <i>et al.</i> ¹⁴	1999	163	47%
Sharma <i>et al.</i> ⁵	2000	44	61%
Zahid Aman <i>et al.</i> ¹¹	2008	50	68%
Nakeeb <i>et al.</i> ¹⁵	2009	77	84.4%
Syed Abbas <i>et al.</i> ⁶	2014	120	94.6%
Dogra <i>et al.</i> ³	2016	50	92%
Binni John <i>et al.</i> ⁸	2017	113	47%
Babar Rehmani <i>et al.</i> ¹²	2018	75	61%
Current study	2020	50	64%

The average positivity for *Helicobacter pylori* in olden day studies from 1993 to 2000 as tabulated in the was found to be 52%. Whereas in the recent studies from 2008 to 2020 was 71% as shown in table:3. This drastic increase of positivity of *H. pylori* infection must be due to the increase in research in this field to find the frequency of prevalence of helicobacter pylori infection in the perforated peptic ulcer disease and availability of the advanced diagnostic tools.

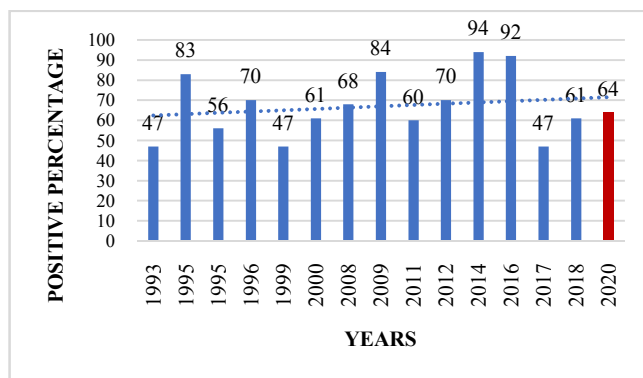


Figure 7 Years Wise Positivity

Thus, the prevalence rate of the *Helicobacter pylori* in perforated peptic ulcer disease is highly variable from locality to locality and standard of living.

Limitation

Further study in future with larger sample size, long term follow-up and isolated risk factor assessment excluding the confounding factors will be required to find the severity of individual risk factor to produce the perforation in a peptic ulcer patient.

CONCLUSION

- The prevalence of *H. pylori* was significant in perforated peptic ulcers.
- *Helicobacter pylori* is the most common predicted risk factor for perforated peptic ulcer.
- The combination of Rapid Urease Test, Microscopy using Giemsa staining and Tissue culture in detection of *H. pylori* was high, when compared to a single test
- Therefore, if we treat these patients with *H. pylori* eradication therapy postoperatively, we can reduce the recurrence of ulcer, reoperation and ensure rapid healing of peptic ulcer.

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