A PROSPECTIVE STUDY ON PREVALENCE OF HELICOBACTER PYLORI IN GASTRODUODENAL PERFORATION
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ABSTRACT

BACKGROUND
Perforation of gastric or duodenal ulcer is one of the serious conditions. Among abdominal emergencies, perforation of peptic ulcer is third in frequency, and acute appendicitis and intestinal obstruction are the most common. Early diagnosis and treatment are very important in reducing the relatively high mortality. Stress is the most important single cause of peptic ulcer in today's modern life. The phrase "no acid - no ulcer" does not hold good nowadays, because peptic ulcer is considered to be more of an infective disease, caused by Helicobacter pylori. The route of transmission is mainly by feco-oral route and oro-oral route. We wanted to determine the prevalence of Helicobacter pylori infection in gastroduodenal perforations in Sivagangai Medical College, Sivagangai, during the period between January 2018 to December 2018.

METHODS
All patients who were diagnosed as perforative peritonitis clinically, radiologically, and in whom explorative laparotomy with omental patch closure was done and patients with history of trauma were excluded. Detailed history of the patients was taken. Patient presented clinically with board like rigidity, with abdominal distension and all blood investigations including complete haemogram, LFT, prothrombin time, serum electrolytes, serum amylase, blood urea, serum creatinine were done. X-ray abdomen erect confirmed the diagnosis. After obtaining the consent for laparotomy and resuscitation, laparotomy was done, mucosal edge biopsy from the ulcer taken and sent for HPE. Biopsy specimen retrieved from edge of the ulcer was preserved in 20% formalin and Giemsa staining was performed. Omental patch closure was done.

RESULTS
All patients underwent emergency laparotomy. Out of 50 cases 38 were male and the patients’ age range was between 20 and 70 yrs. 46 cases were found to be H. pylori positive and only 4 cases were negative. Postoperatively patients who were H. pylori positive were started on anti H. pylori treatment.

CONCLUSIONS
There is high prevalence of H. pylori infection in patients with perforated gastroduodenal ulcer.

KEYWORDS
Gastroduodenal Perforation, Helicobacter pylori, Peptic Ulcer

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another, depending on some socio-demographic and perhaps environmental factors.\(^8\)

Approximately 98-99% of peptic ulcers occur in the first portion of duodenum or in the stomach. Peptic ulcers are remitting relapsing lesions, at one time duodenal ulcers were much common than gastric ulcer and is now approaching those of gastric ulcer. Most often diagnosed in middle and old aged. Male to female ratio in duodenal ulcer is 3:1 and for gastric ulcer is 1.5:2.1. Genetic influence common in duodenal ulcers and are 3 times more common in 1\(^{st}\) degree relatives. Increased incidence noted in HLA – B5 antigen and blood group O in duodenal ulcers.

In 1983, Warren and Marshall first reported isolation of \(H.\) pylori from mucosal biopsy specimen from peptic ulcer patient. 80-90% of population are affected with infection of \(Helicobacter\) pylori. The incidence increases with age and also inversely related to socioeconomic group.\(^5\) Human are the main reservoirs and colonises in the stomach, frequently in the antrum.

**Stages of Acute Perforation**

1. **Primary Stage (Chemical Peritonitis)**- Once perforation occurs gastric contents get into peritoneum and cause chemical peritonitis leading to severe pain in epigastrium and vomiting, tenderness, tachycardia, sweating.

2. **Secondary Stage (Stage of Illusion)**- Secretion from peritoneum neutralize the gastric contents in peritoneal cavity and patient feels better which lasted for about than 6 hrs.

3. **Tertiary Stage (diffuse bacterial peritonitis)**- After about 6 hrs bacteria from gut escapes and diffuse peritonitis sets in.

4. **Terminal stage**- Patient have oliguria, sepsis, shock Hippocratic facies, multiorgan failure.

Two prognostic scoring systems were used- Boey’s score and Mannheim peritonitis index.

**Boey’s Score**

1. No. of hours since perforation
   - Less than 24 hrs score is 0
   - More than 24 hrs score is 1

2. **Co-morbidities**
   - Absent score 0
   - Present score 1

3. **Preoperative Shock**
   - Absent score 0
   - Present score 1

Boey’s score of 3 or more was associated with higher mortality.

**Mannheim Peritonitis Index:**

1. Age more than 50 yrs. score is 5.
2. Females score is 5.
3. Organ failure score is 7.
4. Malignancy score is 4.
5. Preoperative duration > 24 hrs score is 4.

6. Sepsis score is 4.
7. Generalized peritonitis score is 6.
8. Exudate- clear score is 0, cloudy score is 6, faecal score is 12.

Mannheim peritonitis index score >26 was associated with high mortality.

**Investigations**

- X-ray plain shows air under diaphragm in 80% of cases.
- Ultrasound examination shows intraperitoneal free fluid.
- Computerised tomographic examination rarely needed.
- Serum amylase used for prognosis and is directly proportional to mortality.
- Obliteration of liver dullness as a result of collection of escaped gas under diaphragm.
- Detection of \(Helicobacter\) pylori
  1. Non-invasive
     - a) ELISA -100% sensitive
     - b) Urea breath test
  2. Invasive
     - a) Rapid urease test
     - b) Histology- haematoxylin and eosin and modified Giemsa and silver stains
     - c) Culture – difficult method

- Abdominal paracentesis done in suspicious cases in four quadrants.

The most important and immediate step is adequate resuscitation and open surgery like simple closure of perforation with graham omental patch and with biopsy of the ulcer followed by a course of anti \(H.\) pylori regimen of triple therapy thereby reducing residual and recurrent ulcers.\(^7\)

We wanted to study the prevalence of \(Helicobacter\) pylori infection in gastroduodenal perforations in Sivagangai Medical College, Sivagangai.

**METHODS**

This prospective study was carried out in patients with gastroduodenal perforation who were admitted in Sivagangai Medical College. A proforma was made including the signs and symptoms, investigations and management.

**Inclusion Criteria**

All cases of perforation reported in surgery causality of any age and duration of perforation.

**Exclusion Criteria**

Any history of trauma is excluded, and small bowel and large bowel perforation excluded.

**Study Period**

Study period is between January 2018 to December 2018.
All patients managed with emergency laparotomy through midline and contaminated peritoneal fluid aspirated and the exact location and the size of perforation noted. Biopsies taken from the 3, 6, 9 o’clock positions and subjected to the Giemsa staining. Closure was done with live omental patch and peritoneal wash given and drain kept in pelvis. Patients positive for \( H. \) pylori were put on medical treatment. Patients were followed up for a period of 6 months and medical therapy includes cap. lansoprazole 30 mg, tab. Tinidazole 500 mg, tab. clarithromycin 250 mg twice daily for 14 days.

RESULTS
Out of 50 patients 38 were found to be males and 12 were females, ratio being 3:1 which is comparable with Ng et al and Aman et al.\(^\text{10,11}\) Incidence is highest in age group of 41-50 yrs. Pain which is severe starts in epigastric region is the symptom. Of the 50 cases, 42 patients had duodenal ulcer perforation which is 84% and only 8 patients had gastric perforation which is 16%. Duodenal perforation is in the anterior wall of the first of the duodenum in all cases. Of the gastric perforation 5 patients had perforation in anterior wall 2 patients had perforation in posterior wall and 1 patient in the lesser curvature. 46 patients were found to be positive for \( H. \) pylori infection and all duodenal perforations were found to be positive which is 92% whereas Aman et al shows 85.1%\(^\text{11}\) and Ng et al shows 70%\(^\text{10}\) and 4 gastric perforations were positive.

<table>
<thead>
<tr>
<th>Age (Yrs.)</th>
<th>Sex</th>
<th>Total (%)</th>
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<tbody>
<tr>
<td></td>
<td>Male (%)</td>
<td>Female (%)</td>
</tr>
<tr>
<td>21-30</td>
<td>4(8)</td>
<td>0(0)</td>
</tr>
<tr>
<td>31-40</td>
<td>6(12)</td>
<td>0(0)</td>
</tr>
<tr>
<td>41-50</td>
<td>14(28)</td>
<td>4(8)</td>
</tr>
<tr>
<td>51-60</td>
<td>10(20)</td>
<td>6(12)</td>
</tr>
<tr>
<td>61-70</td>
<td>4(8)</td>
<td>2(4)</td>
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Table 1

<table>
<thead>
<tr>
<th>Type of Perforation</th>
<th>( H. ) pylori</th>
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<tbody>
<tr>
<td></td>
<td>Positive (%)</td>
</tr>
<tr>
<td>Gastric</td>
<td>6(12)</td>
</tr>
<tr>
<td>Duodenal</td>
<td>40(80)</td>
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<tr>
<td>Total</td>
<td>46(92)</td>
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Table 2

<table>
<thead>
<tr>
<th>( H. ) pylori</th>
<th>Giemsa</th>
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<tbody>
<tr>
<td></td>
<td>Present</td>
</tr>
<tr>
<td>Present</td>
<td>42(84)</td>
</tr>
<tr>
<td>Absent</td>
<td>0(0)</td>
</tr>
<tr>
<td>Total</td>
<td>42(84)</td>
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</tbody>
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Table 3

\( H. \) pylori was detected by Giemsa stain which showed 91.3% sensitivity and 100% specificity.\(^\text{12}\) Kumar et al found that rapid urease test as most sensitive diagnostic method.\(^\text{13}\) All cases came for 8 weeks follow up after 2 weeks of medical management for \( H. \) pylori infection and reviewed with improvement in dyspeptic symptoms and endoscopic examination. 4 patients got persistent of symptoms and incomplete healing in endoscopic examination and rest showed improvement in symptoms and complete healing in endoscopic examination. 4 patients continued with second course of \( H. \) pylori regimen for another 14 days. Chu et al concluded that recurrent ulcers with perforated duodenal ulcer is related to \( H. \) pylori infection.\(^\text{14}\)

DISCUSSION
In this study of 50 cases of gastroduodenal perforation most cases were middle aged and male to female cases were 3:1 which is comparable to Ng et al and Aman et al. Prevalence of \( H. \) pylori infection is 92% whereas in Aman et al it is only 85.1%. Association of duodenal perforation with \( H. \) pylori is 95% in our study and in Ng et al this was found to be 70%. In this study, Giemsa stain had high validity in detecting the \( H. \) pylori infection. Lofeld et al found 70% accuracy in detecting \( H. \) pylori by Giemsa staining of the biopsy sample. Kumar et al found rapid urease test as the most sensitive diagnostic method with prevalence of 70%. Patients positive for \( H. \) pylori were given anti- \( H. \) pylori treatment by administering standard triple therapy for 14 days. There was significant decrease in postoperative symptoms in patients in anti- \( H. \) pylori treatment.

Ng et al found that ulcer relapse was significantly reduced in patients treated with anti- \( H. \) pylori regimen. Chu et al concluded that recurrent ulcer diseases is related to \( H. \) pylori infection.

CONCLUSIONS
Our study reveals the high prevalence of \( H. \) pylori infection in patients with perforated duodenal as well as gastric ulcers. The high positive predictive value of 100% of Giemsa stain indicates the potential for it being a screening test.

REFERENCES
[10] Ng EK, Lam YH, Sung JJ, et al. Eradication of \( Helicobacter pylori \) prevents recurrence of ulcer after


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