

Study of Incidence of *Helicobacter pylori* Infection in Patients of Peptic Ulcer Perforation

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Abstract

Background: Peptic ulcer disease (PUD) is a common disorder that affects millions of individuals each year. PUD has a major impact on our health-care system by accounting for roughly 10% of medical costs for gastrointestinal diseases. *Helicobacter pylori* infection and the use of nonsteroidal anti-inflammatory drugs are the predominant causes of PUD overall, PU mortality and hospitalization rates have declined for the past two decades, but complications such as PU perforation and bleeding remain a substantial health-care problem.

Materials and Methods: A prospective 1-year study conducted in 116 cases of peptic perforation admitted in surgical wards of Sanjay Gandhi Memorial Hospital, Rewa, M.P., during the study period June 2016–May 2017. All patients suspected of peptic perforation were admitted to surgery ward and underwent emergency exploratory laparotomy. Post-operatively, *H. pylori* serological test to detect IgG antibody was done with patients' blood serum. Their findings were recorded in a pro forma and master chart. The information obtained was tabulated and analyzed.

Results: The incidence of *H. pylori* infection in our study was found to be 31.03%, i.e., 36 cases of 116 cases.

Conclusion: Tobacco chewing, smoking, alcohol, inadvertent use of analgesics, and *H. pylori* infection are the most common predisposing factors for PUD, and patients' inability to get proper and complete treatment is responsible for peptic perforation. Early hospitalization and urgent surgical intervention can significantly reduce the post operative morbidity and mortality in peptic ulcer perforation patients. Post-operative *H. pylori* eradication therapy and follow-up endoscopic facilities in patients found positive for *H. pylori* can reduce recurrence rates and subsequently the burden of this disease.

Key words: *Helicobacter pylori*, Incidence, Peptic ulcer perforation

INTRODUCTION

Peptic ulcers (PUs) are defects in the gastric or duodenal mucosa that extends through the muscularis mucosa. Every year, PU disease (PUD) affects 4 million people around the world.^[1] Complications are encountered in 10–20% of these patients and 2–14% of the ulcers perforate.^[2,3] Perforated PU (PPU) is relatively rare but life-threatening with the mortality varying from 10% to 40%.^[2,4-6] Moreover, studies have confirmed the strong association between gastric antral infection with

Helicobacter pylori and peptic ulceration. More than 90% of patients with PUD are infected with *H. pylori*, and eradication of this infection not only heals most uncomplicated ulcers but also significantly decreases the likelihood of recurrent ulceration. Although the frequency of ulcer disease in general has declined, the number of patients affected by bleeding and perforation has not changed significantly. Causes for peptic perforation are many, and knowledge about the occurrence of different etiology of peptic perforation is important as preventive measures can be undertaken. Perforation is one of the most important complications of a PU. In spite of modern management, it is still a life-threatening catastrophe. The sudden release of gastric or duodenal contents into the peritoneal cavity through a perforation leads to a devastating sequence of events, causing life threatening complications. Among abdominal emergencies, perforations of PU are third in frequencies, acute appendicitis, and acute intestinal obstruction being

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more common. Prompt recognition of the condition is very important, and only by early diagnosis and treatment, it is possible to reduce the still relatively high mortality.

MATERIALS AND METHODS

The present study “study of incidence of *H. pylori* infection in patients of PU perforation” was carried out in 116 cases admitted in surgical wards of the Department of Surgery, Shyam Shah Medical College, and associated Sanjay Gandhi Memorial Hospital Rewa during June 1st, 2016–May 31st, 2017.

Patients of peptic perforation were admitted through casualty department, surgical OPD, or transferred from other departments. Patients were diagnosed on clinical grounds with classical symptoms such as epigastric pain, distension, vomiting, fever, not passing flatus and stools, and not passing urine. Patients examined for signs of shock and dehydration. General examination was done for vital status, pallor, jaundice, edema, and nutritional status, and abdomen was examined for distension, tenderness, rigidity and guarding, obliteration of liver dullness, free fluid, and absence of bowel sounds. Furthermore, complete personal history was obtained which includes smoking, alcoholism, tobacco chewing, analgesic abuse, and history of other comorbidities. All findings were recorded in details.

Investigations such as complete blood counts, liver function test, renal function test, random blood sugar, coagulation profile, blood grouping, serum electrolytes, X-ray chest, and abdomen erect view was done. After resuscitation and stabilization of vitals, patient is prepared for surgery - exploratory laparotomy was done to deal with pathology. Post-operatively, *H. pylori* serological test to detect IgG antibody was done with patients' blood serum. Patients were managed in wards post-operatively. After recovery, patients who tested positive for *H. pylori* were given anti-*H. pylori* drug therapy and those who tested negative were advised to take PPIs. Regular follow-up was done in SOPD.

All these data were recorded meticulously in pro forma and in master chart for further systematic tabulation for observations and analysis. Summary and conclusions were drawn after discussion with the review of the literature.

RESULTS

The incidence of *H. pylori* infection was found to be 31.03%, i.e., 36 cases of 116 cases of PPU [Table 1].

Most of the *H. pylori*-positive cases belong to 41–60 years of age group (72.2%) [Table 2].

In the present series, peptic perforation was more common in males with male-to-female ratio of 13.5:1.

H. pylori-positive cases in peptic perforation were more common in males (94.44%). Male-to-female ratio was 17:1 [Table 3].

H. pylori-positive cases in peptic perforation were more common in patients belonging to rural background (91.66%) [Table 4].

H. pylori-positive cases were more common in patients belonging to lower socioeconomic status (94.44%) [Table 5].

In the present series, among *H. pylori* positive cases, 26 cases (72.2%) had a history of dyspepsia and 10 cases (27.8%) had a history of analgesic abuse [Table 6].

Serology for *H. pylori* was positive in 25 cases (41%) of duodenal perforation and in 11 cases (22.44%) of pre-pyloric perforation.

Among *H. pylori*-positive cases, in 69.4% of cases, the site of perforation was first part of duodenum, and in 30.6%, site of perforation was pre-pyloric area of the stomach [Table 7].

DISCUSSION

Although the number of hospital admissions for uncomplicated PU has decreased dramatically with advances in medical therapy for PUD, there is an increasing trend toward hospitalization for its complications such as hemorrhage and perforation.^[7] PPU is a serious complication of PUD with potential risk of grave complications.

It is now widely accepted that infection with *H. pylori* is one of the most important factors in the development of peptic ulceration.^[8,9] *H. pylori* infection and the accompanying inflammation disrupt the inhibitory control of gastrin release by decreasing antral somatostatin.^[10] The resulting increase in gastrin release and gastric acid secretion is a key mechanism by which the *H. pylori* infection induces PUD.^[10] In most instances, infection with *H. pylori* seems to be acquired in early childhood. In contrast to many other infections, the immune system does not contribute to the healing.^[11,12] Another problem with eradicating *H. pylori* is that it is not only located on the surface of the gastric mucosa but also in the layer of mucus protecting it. In the present series, *H. pylori* antibody was positive in 36 cases of PU perforation (31.03%) which is similar to that of Dhar,^[13] Kumar *et al.*,^[14] and Khanna *et al.*^[15]

Table 1: Distribution of cases according to the presence of *H. pylori* antibody in patients serum

| <i>H. pylori</i> antibody | Number of cases (%) |
|---------------------------|---------------------|
| Present | 36 (31.03) |
| Absent | 80 (68.96) |
| Total | 116 (100) |

*H. pylori: Helicobacter pylori***Table 2: Distribution of *H. pylori*-positive cases of peptic perforation according to age group**

| Age group | Number of cases (%) |
|-----------|---------------------|
| 0–20 | 4 (11.1) |
| 21–40 | 13 (36.2) |
| 41–60 | 15 (41.6) |
| 61–80 | 4 (11.1) |
| Total | 36 (100) |

*H. pylori: Helicobacter pylori***Table 3: Distribution of *H. pylori*-positive cases according to gender**

| Gender | Cases of peptic perforation Number of cases (%) |
|--------|--|
| Male | 34 (94.44) |
| Female | 2 (5.36) |

*H. pylori: Helicobacter pylori***Table 4: Distribution of *H. pylori*-positive cases according to residence**

| Residence | Cases of peptic perforation Number of cases (%) |
|-----------|--|
| Rural | 33 (91.66) |
| Urban | 3 (8.34) |

H. pylori: Helicobacter pylori

The disease affects middle and young age groups in this country. In this study, 36.2.1% were below 40 years of age unlike western data with a tendency of the disease to affect older age group.^[16,17] *H. pylori*-positive cases were most common in 41–60 years of age group (41.6%), followed by 36.2% in 21–40 years of age. The population with gastric ulcers tends to be older, (so higher mortality than duodenal ulcer), this is due to the increasingly common use of nonsteroidal anti-inflammatory drugs including aspirin in this elderly cohort, many of whom also have *H. pylori* infection.^[18]

PUD is more prevalent in low socioeconomic groups and considerably more common in the developing world than in the west.^[18,19] *H. pylori*-positive cases in peptic perforation were more common in patients belonging to rural background (91.66%). This can be explained on the basis that patients of the rural area are of low socioeconomic group and they do not get opportunity for the treatment of their illness either in proper time or they fail to receive the full course of treatment.

Table 5: Distribution of *H. pylori*-positive cases according to socioeconomic status

| Socioeconomic status | Cases of peptic perforation Number of cases (%) |
|----------------------|--|
| Lower | 34 (94.44) |
| Middle | 2 (5.36) |
| Upper | 0 (0) |

*H. pylori: Helicobacter pylori***Table 6: Distribution of *H. pylori*-positive cases according to history**

| Past history | Cases of peptic perforation Number of cases (%) |
|-----------------|--|
| Dyspepsia | 26 (72.2) |
| Analgesic abuse | 10 (27.8) |

*H. pylori: Helicobacter pylori***Table 7: Incidence of *H. pylori*-positive cases in peptic perforation according to site of perforation**

| Site of perforation | Total cases | Number of positive cases (%) |
|-----------------------------|-------------|------------------------------|
| First part of duodenum | 61 | 25 (41) |
| Pre-pyloric area of stomach | 49 | 11 (22.44) |

H. pylori-positive cases were more common in patients belonging to lower socioeconomic status (94.44%) which is similar to that of AM Al-Marousmi (2012).^[20]

In the present series, peptic perforation was more common in males with male-to-female ratio of 13.5:1. A possible explanation for these findings may be that some behaviors, such as tobacco chewing, smoking, and drinking alcohol, are more frequent among men, thus increasing the risk of PUD and perforation, especially in young- and middle-aged adults.

Dyspepsia for 3 months or more was present in 72.2% of the study group denoting chronicity of the disease and negligence of dyspepsia in young people leading to such a serious complication.

Among *H. pylori*-positive cases, 26 patients had a history of dyspeptic symptoms for 3 months or more.

This is the reason for need of early detection and eradication of *H. pylori* to reduce the complication like PPU.

The perforation site usually involves the anterior wall of the duodenum (60%) although it might occur in antral (20%) and lesser-curvature gastric ulcers (20%).^[21] Among *H. pylori*-positive cases, in 69.4% of cases, the

site of perforation was first part of the duodenum, and in 30.6%, the site of perforation was pre-pyloric area of the stomach.

Timely diagnosis of peptic ulcer with detection and eradication of *H. pylori* can reduce the burden on healthcare infrastructure and can also improve the quality of life for thousands of patients..

CONCLUSION

PPU is a disease of middle-aged adults. More commonly affects males than females. More often the patients are from low socioeconomic status and rural background. Tobacco chewing, smoking, alcohol, inadvertent use of analgesics, and *H. pylori* infection are the most common predisposing factors for PUD, and patients' inability to get proper and complete treatment is responsible for peptic perforation. Delay in hospitalization due to initial treatment by homemade medicines and non-availability of essential surgical care further complicates the perforation in this region.

Peptic perforation is diagnosed on clinical grounds immediately as patient reaches emergency department, yet due to delayed hospitalization, time lost in resuscitation of the patient affects the outcome of standard surgical procedure. Early diagnosis of PUD and detection of *H. pylori* infection, prompt eradication therapy, and avoidance of various predisposing factors can help to reduce the morbidity and mortality associated with this global disease.

Post-operative *H. pylori* eradication therapy follow-up endoscopic facilities in patients found positive for *H. pylori* can reduce recurrence rates and subsequently the burden of this disease.

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