

Clinical Study on Peptic Ulcer Perforation and its Correlation with *H. Pylori* Infection, *H. Pylori* Eradication Therapy and Follow up Endoscopy at A Tertiary Care Teaching Hospital

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Abstract

Introduction: Peptic ulcer disease is one of the most common disorders of the gastrointestinal system. A number of factors are found to initiate the progress the disease like *H. Pylori* infection, stress, NSAID use, smoking and alcoholism. Peptic ulcer perforation is an acute emergency complication when the contents of the stomach spill into the peritoneum. Aim of the study is to observe the prevalence of *H. Pylori* in peptic ulcer perforation cases and the rationale of *H. Pylori* eradication therapy post operatively in *H. Pylori* positive cases and follow up endoscopic biopsy at six weeks to confirm eradication and to investigate other factors associated with peptic ulcer perforation.

Materials and Methods: This study was done as a prospective observational study, in patients who present in surgery casualty undergoing surgery for peptic ulcer perforation for a period of one year in a tertiary care teaching hospital. This study included 100 patients who present in surgery casualty undergoing surgery for peptic ulcer perforation. *H. Pylori* infection is confirmed by mucosal biopsy at the time of surgery using rapid urease test. *H. Pylori* eradication regimen is given to positive cases for 14 days. Follow up endoscopy done at 6 weeks and biopsy taken from gastric antrum and rapid urease test performed to confirm eradication.

Results: The site of perforation was; in gastric antrum in 93% (n=93) of the cases in duodenum in 7% (n=7) of the cases. Out of 100 patients, 63% (n=63) were rapid urease test positive. 37% (n=37) were rapid urease test negative Out of 100 patients, rapid urease test was positive in 63% (N=63) cases. *H. Pylori* treatment was given for 62 patients out of the 63 cases. One of rapid urease positive patients was not treated with *H. Pylori* regimen. Out of 62 patients treated for *H. Pylori*, around 92% (n=57) turned out negative while around 8% (n=5) were positive.

Conclusion: Routine endoscopic examination of such patients should also form a part of the follow-up to look for ulcer healing postoperatively. There is a change in the trend of the management of peptic ulcer perforation with the advent of newer and less invasive techniques, such as laparoscopic or endoscopic perforation sealing technique. A multidisciplinary approach for perforated peptic ulcer management is of utmost importance and help in early recovery of the patient.

Keywords: Peptic ulcer, Perforation, *H. Pylori*.

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Introduction

Peptic ulcer disease is one of the most common disorders of the gastrointestinal system[1]. The ulcer develops when there is an imbalance between the damaging and protective factors[2]. When there is an excessive damage to the mucosa, it leads to the ulceration and manifests as gastric and duodenal ulcers[3]. A number of factors are found to initiate the progress the disease like H. pylori infection, stress, NSAID use, smoking and alcoholism[4]. The drug treatment focuses on reducing these damaging factors and increase the protective factors[5, 6].

Around 5% of the global population is affected by peptic ulcer. In most of these cases, H. Pylori infection is found to be the causative agent. NSAIDs are other major causative factors. In most of the cases, both the agents may be involved in the development of peptic ulcer. When there is perforation and bleeding, it is an acute medical emergency leading to more than 3 lakh hospital admissions in the United States. An estimated 15,000 deaths annually are attributed to peptic ulcer disease. Increased age has a higher correlation with incidence; 29.7% at <30 years of age vs. 63% at 55-65 years of age. In most of the cases, it is associated with H. pylori infection[7].

The normal mucosal barrier is protected by the prostaglandins which are converted from Arachidonic acid through the cyclooxygenase system. This system is inhibited by NSAIDs[9]. Other factors include cigarette smoking[10], stress[11], and acid-pepsin secretions[12]. The treatment is by non-pharmacological management which involves lifestyle changes, pharmacological management which involves anti H. pylori treatment, surgical management- When the medical management is not sufficient or when there are acute emergencies like peptic ulcer perforation.

Peptic ulcer perforation is an acute emergency when the contents of the stomach spill into the peritoneum. There is a sudden onset of symptoms; Acute generalised abdominal pain, Tachycardia, Abdominal guarding and rigidity, abdominal distension, Obstipation, Fever and Hypotension. Radiological evaluation shows air under the diaphragm. Surgical management is the treatment of choice. It is considered an acute abdomen. Open laparotomy is done with omental patch closure.

Based on this aim of the study is to observe the prevalence of H. Pylori in peptic ulcer perforation cases and the rationale of H. Pylori eradication therapy post operatively in H. Pylori positive cases and follow up endoscopic biopsy at six weeks to confirm eradication and to investigate other factors associated with peptic ulcer perforation.

Materials and methods

This study was done as a prospective observational study, in patients who present in surgery casualty undergoing surgery for peptic ulcer perforation for a period of one year in a tertiary care teaching hospital. This study included 100 patients who present in surgery casualty undergoing surgery for peptic ulcer perforation. All patients admitted in emergency department with signs and symptoms of peptic ulcer perforation and undergoing surgery for peptic ulcer perforation are included in the study. While patients who were haemodynamically unstable at the time of laparotomy or refused for H. Pylori test and suspected cases of malignant perforation were excluded.

Cases admitted to GMKMC hospital Salem after getting written consent from the patient with perforated peptic ulcer, resuscitation and laparotomy is performed in the emergency department. H. Pylori

infection is confirmed by mucosal biopsy at the time of surgery using rapid urease test. H. Pylori eradication regimen is given to positive cases for 14 days. Follow up endoscopy done at 6 weeks and biopsy taken from gastric antrum and rapid urease test performed to confirm eradication.

All data were recorded in structured questionnaires, coded and entered in Microsoft Excel. The data was analysed using SPSS v23

Results

In our study of 100 patients the mean age of the participants is 55.68 years with a standard deviation of 10.7 years. The median age is 54.5 years ranging between 34 and 84 years. Out of 100 patients; Males were 81% (n=81) and females were 19% (n=19). The patients present with abdominal pain as the main complaint in all the cases. The mean duration of abdominal pain is 1.9 days (S.D=1.03 days) ranging between 1-5 days and a median of 2 days. The other chief complaints include fever, obstipation and vomiting. After abdominal pain, vomiting was the second most commonly quoted complaint with around 98% (n=98) being affected.

The mean duration of these complaints is 1.13 days (S.D=0.3 days) ranging between 1-2 days and a median of 1 day. Other complaints like decreased urine output was also present. Abdominal distension was the third commonly reported symptom in 82% (n=82) of the patients. The mean duration of other complaints is 1.19 days

(S.D=0.4 days) ranging between 1-3 days and a median of 1 day. The other chief complaints include fever, obstipation and vomiting. After abdominal pain, vomiting was the second most commonly quoted complaint with around 98% (n=98) being affected. Abdominal distension was the third commonly reported symptom in 82% (n=82) of the patients.

Out of 100 patients, 51% (n=51) had diabetes mellitus, one patient had TB, three patients had epilepsy and two of them had malaria. None of them had any history of previous surgeries, no jaundice or cirrhosis. Out of 100 patients, 39% (n=39) of them were smokers while 41% (n=41) were alcoholics. Around 36% (n=36) had NSAID usage. The mean duration of hospitalisation is 14.3 days with a standard deviation of 2.03 days. The median duration is 14 days ranging between 8 and 19 days.

All the patients were diagnosed with hollow viscous perforation. The patients were treated with emergency laparotomy proceeded with live omental patch closure. The site of perforation was; in gastric antrum in 93% (n=93) of the cases in duodenum in 7% (n=7) of the cases.

Out of 100 patients, 63% (n=63) were rapid urease test positive. 37% (n=37) were rapid urease test negative. Out of 100 patients, rapid urease test was positive in 63% (N=63) cases. H. Pylori treatment was given for 62 patients out of the 63 cases. One of rapid urease positive patients was not treated with H. Pylori regimen.

Table 1: H.Pylori positivity before treatment

S. No	H. Pylori Treatment regimen	Frequency	Percentage
1	Given	62	62.0
2	Not given	38	38.0
	Total	100	100

Rapid Urease Test after 6 weeks

Out of 62 patients treated for H. Pylori, around 92% (n=57) turned out negative while around 8% (n=5) were positive.

Table 1: H. Pylori positivity after treatment

S. No	Rapid Urease Test after 6 weeks (n=62)	Frequency	Percentage
1	Positive	5	8.06
2	Negative	57	91.94
	Total	100	100

Discussion

Peptic ulcer disease is one of the most common disorders of the gastrointestinal system¹. The ulcer develops when there is an imbalance between the damaging and protective factors^[2]. When there is an excessive damage to the mucosa, it leads to the ulceration and manifests as gastric and duodenal ulcers^[3]. A number of factors are found to initiate the progress the disease like H. pylori infection, stress, NSAID use, smoking and alcoholism^[4]. The drug treatment focuses on reducing these damaging factors and increase the protective factors^[5,6].

Around 5% of the global population is affected by peptic ulcer. In most of these cases, H. Pylori infection is found to be the causative agent. NSAIDs are other major causative factors. In most of the cases, both the agents may be involved in the development of peptic ulcer. When there is perforation and bleeding, it is an acute medical emergency leading to more than 3 lakh hospital admissions in the United States. An estimated 15,000 deaths annually are attributed to peptic ulcer disease. Increased age has a higher correlation with incidence; 29.7% at <30 years of age vs. 63% at 55-65 years of age. In most of the cases, it is associated with H. pylori infection^[7]. This is the most common agent in the initiation and progress of peptic ulcer disease^[8]. The normal mucosal barrier is protected by the prostaglandins which are converted from Arachidonic acid through the cyclooxygenase system. This system is inhibited by NSAIDs^[9]. Other factors include cigarette smoking^[10], stress^[11], and acid-pepsin secretions^[12],

Peptic ulcer perforation is an acute emergency when the contents of the stomach spill into the peritoneum. There is a sudden onset of symptoms; Acute generalised abdominal pain, Tachycardia, Abdominal guarding and rigidity, abdominal distension, Obstipation, Fever and Hypotension. Radiological evaluation shows air under the diaphragm. Surgical management is the treatment of choice. It is considered an acute abdomen. Open laparotomy is done with omental patch closure^[13].

The mean age of the participants is 55.68 years with a standard deviation of 10.7 years. The median age is 54.5 years ranging between 34 and 84 years. This is in accordance with the studies conducted by Mathur et al^[14] and Alegbeleye et al.^[15] Out of 100 patients; Males were 81% (n=81) and females were 19% (n=19). Which is in accordance with studies conducted by Thorsen et al^[16] and Jhobta et al.^[17]

The patients present with abdominal pain as the main complaint in all the cases. The mean duration of abdominal pain is 1.9 days (S.D=1.03 days) ranging between 1-5 days and a median of 2 days. The other chief complaints include fever, obstipation and vomiting. After abdominal pain, vomiting was the second most commonly quoted complaint with around 98% (n=98) being affected.

The mean duration of these complaints is 1.13 days (S.D=0.3 days) ranging between 1-2 days and a median of 1 day. Other complaints like decreased urine output was also present. Abdominal distension was the third commonly reported symptom in 82% (n=82) of the patients. The mean duration of other complaints is 1.19 days

(S.D=0.4 days) ranging between 1-3 days and a median of 1 day.

Out of 100 patients, 51% (n=51) had diabetes mellitus, one patient had TB, three patients had epilepsy and two of them had malaria. None of them had any history of previous surgeries, no jaundice or cirrhosis. Out of 100 patients, 39% (n=39) of them were smokers while 41% (n=41) were alcoholics. A study by Asefa and Geyesus[18] demonstrated history of smoking in 82.8% of their study population. Kamsir et al.[19] provided definite conclusion regarding the relation between alcohol consumption and peptic ulcer perforation. Around 36% (n=36) had NSAID usage. The mean duration of hospitalisation is 14.3 days with a standard deviation of 2.03 days. The median duration is 14 days ranging between 8 and 19 days.

All the patients were diagnosed with hollow viscous perforation. The patients were treated with emergency laparotomy proceeded with live omental patch closure. The site of perforation was; in gastric antrum in 93% (n=93) of the cases in duodenum in 7% (n=7) of the cases. Results of the study by Mathur et al.[14] also show an increase in the incidence of pyloro-duodenal perforation.

Out of 100 patients, 63% (n=63) were rapid urease test positive. 37% (n=37) were rapid urease test negative. Out of 100 patients, rapid urease test was positive in 63% (N=63) cases. H. Pylori treatment was given for 62 patients out of the 63 cases. One of rapid urease positive patients was not treated with H. Pylori regimen.

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Out of 62 patients treated for H. Pylori, around 92% (n=57) turned out negative while around 8% (n=5) were positive. The findings from this study corroborate with the academic literature. In a study by Gupta et al., [20] all patients were given postoperative anti-H. Pylori treatment and none had active ulcer at follow-up endoscopy.

Conclusion

Postoperative treatment with H₂ blockers or proton pump inhibitors along with anti-*Helicobacter pylori* regimen should be prescribed for all patients with peptic ulcer perforation. Routine endoscopic examination of such patients should also form a part of the follow-up to look for ulcer healing postoperatively. There is a change in the trend of the management of peptic ulcer perforation with the advent of newer and less invasive techniques, such as laparoscopic or endoscopic perforation sealing technique. A multidisciplinary approach for perforated peptic ulcer management is of utmost importance and help in early recovery of the patient.

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