Study on Incidence of Helicobacter Pylori in Patients of Gastroduodenal Perforation Admitted in Tertiary Care Center - Hamidia Hospital Bhopal

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ABSTRACT

Introduction: Acid-reduction surgery has been strongly advocated in past for perforated peptic ulcers because of the high incidence of ulcer relapse after simple closure. Since Most patients with Gastroduodenal perforation are associated with Helicobacter pylori (H. pylori) infection, Simple oversewing procedures either by an open or laparoscopic approach together with H. pylori eradication appear to supersede definitive ulcer surgery.

Material and Methods: Total number of 70 patients were included in this prospective study with diagnosis of perforation peritonitis admitted in emergency ward. These patients were operated in emergency by simple closure of perforation with omental patch repair. Peroperative biopsy sample was taken from margin of perforation and sent for staining by H & E and Giemsa staining for H. pylori. After 15 days endoscopic biopsy was taken from gastric antrum for H. pylori staining. Anti H. Pylori Eradication Therapy (Triple therapy--1 PPI + 2 antibiotic) for 14 days was given to the positive cases. These patients were followed for 1 year for recurrence of ulcer.

Results: Out of 70 consecutive patients (mean age = 47 years, range 15-75) of perforation H. pylori was seen in 48 patients (68.57%). Total 28 patients (40%) were having h/o use of NSAIDS in recent past. Male to female ratio was about 3:1 and most common age group was 46-55 years. In the H. pylori positive patients, Anti H pylori eradication therapy was given. These all patients are in follow up and are asymptomatic in 3 months.

Conclusions: H. pylori is strongly associated with Gastro duodenal perforation, (48/70) 68.57% were positive for H. pylori. Gastric perforation was more common than duodenal perforation and prepyloric region was commonest site. For H. pylori detection, biopsy and staining is a good method. Early Anti H. pylori therapy for patients of Gastro duodenal perforation who were positive for H. pylori, provide an excellent cure after simple closure of perforation.

Key words: H. pylori, gastroduodenal perforation, peptic ulcers

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INTRODUCTION

Perforated gastric and duodenal ulcer remains a dramatic surgical

emergency and is a formidable complication of ulcer disease associated with significant morbidity and mortality. It requires immediate surgical intervention because of fatal outcome due to sepsis. Gastric perforation is common sequel of peptic ulcer disease. The annual incidence of ulcer is 1.8 % or roughly 500000 thousand new cases per year. About 9000 patients die from complications of their Peptic Ulcer Disease (1).

Roughly 75% gastric ulcer and 90% of duodenal ulcer are associated with the H. pylori infection (2). The 2nd most common cause of PUD is NSAID ingestion. NSAIDS induced ulcer are more common in stomach than duodenum (3). Smoking, alcohol, stress and steroid are other important risk factors for peptic perforation. It is widely believed that it is silent chronic ulcer that perforates specially in patients who are being treated with steroid or NSAIDS for one or another reason, usually symptoms of perforation occur with dramatic suddenness.

Exact determination between H. pylori and peptic perforation is not available, mostly because exact data are not available from developing countries but this organism must make the major contributor to the etiology of the disease and in the maintenance of chronicity of the ulcer (4). If this infection is cured, ulcers and their complications rarely occur (5).

Current scientific evidence points to a strong association between H. pylori and gastro duodenal perforation (6). Cure of the infection results in a marked reduction in ulcer recurrence. Permanent cure of the peptic ulcer can be achieved (7).

The gold standard for diagnosis of H. pylori infection has been biopsy-obtained during endoscopy-followed by testing of urease and/or histologic staining with heamatoxylin and eosin (8). However, no single test has yet emerged as definitive in daily clinical practice for several reasons.

Gastric antrum is commonly involved in chronic active gastritis caused by H. pylori (9) Endoscopic gastric biopsies stained by variety of histological stains is gold standard in the diagnosis of H. pylori (10). The pyloric antrum has been the site of biopsy in many studies with single distal antral biopsy having a sensitivity of 97% for H. pylori detection (11).

As gastro duodenal perforation is a common problem in our emergency surgical ward and there are not much studies on the association between Helicobacter pylori and gastro duodenal perforation. So with these things keeping in mind present study was carried out to see the incidence of H. pylori in peptic perforation.

AIMS AND OBJECTIVES

1. To determine the incidence of H. pylori in gastro duodenal perforation patients admitted in Hamidia Hospital Bhopal.
2. To give anti H pylori regime for H. pylori positive patients to prevent the recurrence of ulcer.
3. To study various risk factors associated with gastro-duodenal perforation.

MATERIALS AND METHODS

The present study was carried out in Gandhi Medical College and Associated Hamidia Hospital Bhopal from October 2011 to October 2012. Study entitled "*Incidence of Helicobacter Pylori in Gastroduodenal Perforation Patients Admitted in Hamidia Hospital Bhopal*". Total 70 patients were included in this study with diagnosis of perforation peritonitis admitted in emergency ward. It was a prospective study.

Case selection

Inclusion criteria

All patients of gastroduodenal perforation admitted in Hamidia Hospital Bhopal.

Exclusion criteria

Patients age < 12 years are not included in this study. Patients of perforation peritonitis due to blunt injury or penetrating injury were not included

Methodology

A total number of 70 patients were included in this study, all were admitted in emergency wards with a clinical diagnosis of perforation peritonitis. Patient's history was taken. Relevant clinical, biochemical and radiological examinations were done to establish the diagnosis of peptic ulcer perforation. All of the patients were operated. Intraoperatively the site and size of the ulcer (*fig. 1*), condition of surrounding duodenum and omentum, and also any other additional finding was noted. In all patients surgical procedure performed in emergency was simple closure of perforation with omental patch repair. Per operative biopsy sample was taken from the margin of perforation and sent for staining by Hematoxylin-eosin and Giemsa staining for H. pylori. (*fig. 2*) Postoperatively patient were managed by nil by mouth, ryle's tube insertion till bowel sounds were heard and flatus appreciated by the patient. Drains were taken out according to the amount of drainage, Ryles tube was removed after 3-5 days. After

Figure 1 - Intraoperative picture of gastric perforation

Figure 2 - Appearance of H. pylori with H & E staining in microscope

15 days, six biopsy samples were taken endoscopically from gastric antrum for H. pylori staining. (fig. 3) By cumulative data incidence of H. pylori was determined. H. pylori Eradication Therapy (triple therapy 1PPI +2 antibiotics) was given for 14 days to the positive cases. These patients will be followed for 1 year for recurrence of ulcer or perforation.

OBSERVATIONS AND RESULTS

(TABLES 1-10, CHARTS1-14)

DISCUSSION

Helicobacter pylori ever since its isolation from

Figure 3 - Endoscopic view of repaired gastric perforation

Table 1 - Patients with different size of perforation

Size of perforation	Total	%
< 1 cm	24	34.28
1-2 cm	42	60
>2 m	4	5.72

Table 2 - Patient with the different site of perforation

Site	Total	%
Prepyloric	38	54.28
Pyloric	18	25.71
Duodenal	14	20

Table 3 - Posivity of Helicobacter pylori in peroperative and postoperative biopsy

Biopsy	Positive (IN 70)	%
Per-operative (marginal biopsy)	25/70	35.7
Post-operative (endoscopic antral biopsy)	48/70	68.57

Table 4 - Number of patients with observed risk factors

Risk factors	=n	%age
Helicobacter pylori	48/70	68.57 %
Smoking	22/70	31.42 %
Stressful life style	9/70	12.85 %
Family history of proved DU	8/70	11.42 %
NSAIDs abuse	28/70	40 %
Steroid abuse	6/70	8.57%
Alcohol intake	19/70	27.14%

Table 5 - Comparison of patients with perforated gastroduodenal ulcer found to be positive or negative for Helicobacter pylori

	Helicobacter pylori positive 48 (68.57%)	Helicobacter pylori negative 22 (31.42%)	Total 70 (100%)
Gastric ulcer	40 (71.42%)	16 (28.57%)	56 (80%)
Duodenal ulcer	8 (57.14%)	6 (42.85%)	14 (20%)
Sex: M/F	38 / 10 (79% / 21%)	16 / 6 (72% / 28%)	54 / 16 (77% / 23%)
Mean age (yr)	45.5	45.7	45.56
Range (yr)	15-68	18-70	45-70
Past history of peptic ulcers	6 (12.5%)	2 (9.1%)	8 (11.4%)
Current NSAIDs	12 (25%)	16 (72%)	28 (40%)

Table 6 - Patients with different food habits

Food Habit	Total	%
Vegetarian	38	54.28
Non Vegetarian	32	45.72

Table 8 - Patients with different life style

Life Style	Total	%
Active Workers	43	61.42
Sedentary Workers	27	38.58

Table 7 - Patients with medical illness

DISEASE	PRESENT	%
Ischaemic Heart Disease	4/70	5.71
Diabetes Mellitus (DM)	2/70	2.85
Tuberculosis	5/70	7.15%
Hypertension	8/70	11.42

Table 9 - Patients with different occupation

Residential Living	Total	%
Rural	55	78.58
Urban	15	21.42

Age (years)	Duo.perfo.	Gast.perfo.	Total(70)	%
15 - 25	0	6	6	8.5%
26 - 35	2	5	7	10%
36 - 45	3	9	12	17.1%
46 - 55	4	19	23	32.85%
56 - 65	4	10	14	20%
66 - 75	1	7	8	11.4%

Chart 1 - Age wise distribution

Sex	DP (14)	GP (56)	Total (70)	%
Male	12	42	54	77.14 %
Female	2	14	16	22.85 %

Chart 2 - Sex wise distribution

Number of cases	Total (70)	%
GP	56	80%
DP	14	20%

Gas. Perfo. - Vs - Duo. Perfo.

Chart 3 - Patients with duodenal perforation & gastric perforation

Size of perforation	Total	%
< 1 cm	24	34.28
1-2 cm	42	60
>2 m	4	5.72

Chart 4 - Patients with different size of perforation

Gastric biopsy in 1983 has been gaining increasing significance. The organism is now considered to play an important role in etiopathogenesis of gastroduodenal ulcer, perforation, atrophic gastritis and lymphoma and adenocarcinoma. So the present study was done to find

out association and incidence of *H. pylori* in gastro-duodenal perforation.

We found 68.57 % (48 out of 70 cases) patients of peptic perforation were positive for *H. pylori*. (table 3)

Out of 70 cases of perforated ulcers the highest

SITE	TOTAL	%
PREPYLORIC	38	54.28
PYLORIC	18	25.71
DUODENAL	14	20

Chart 5 - Patient with the different site of perforation

Results	No. of patients(in 70)	%
H pylori positive	48	68.58
H pylori negative	22	31.42

Chart 6 - Results of biopsy test in study (staining of H. pylori by Giemsa and H & E stain)

incidence was between 46 to 55 years (32.85%). (chart 1) The mean age of presentation was 45.5 years. (table 5) Various case series in India and abroad have mean age of presentation between 40-60 years, and in our study between 46-55 years. I.G Medical College, Shimla, India in 1983-92, showed the mean age of presentations between 41-50 years, this is nearly consistent with that of our study. A study on perforated peptic ulcer done in JLN Medical College Ajmer Rajasthan India, showed the maximum age incidence between 30-40 years. Kirkpatrick et al (1980) reported the mean age of 49 and 51.3 in his two series presented in 1982 and 1986 respectively (12). Hamby et al (1993) reported the mean age of 59 years. This might be due to the different trends of this entity in the Western countries where the elderly patients are the primary victims.

Out of 70 patients, 54 (77%) were male and 16 (23%) were female. (chart 2) Male to female ratio was 3:1. Kirkpatrick et al (1980) and Boey et al (1982) reported the incidence of males to be 91% and 85 % respectively. While Hamby et al (1993) reported the incidence of 69% for males (13). A study in I.G. Medical College Shimla over the period of 10 years from 1983-1992, showed male to female ratio of 17:1.

Use of NSAID is one of the factors generally considered to be important in the development of perforated ulcers. In our study 40 % patients (28 out of 70) were taking NSAIDS. (chart 9) Jorgensen et al in a study of 195 patients with acute perforation, found that 18 % had taken NSAID (14). The association between

PERFORATION	POSITIVE FOR H PYLORI	%
GASTRIC	40/56	71.42
DUODENAL	8/14	57.14

Chart 7 - Positivity of H. pylori in gastroduodenal perforation

aspirin and perforated peptic ulcer was addressed by Duggan in a prospective study of 118 patients with acute perforation.

In our study 31.42% patients were smokers and were smoking 20 bidi/day and 68.58% were non-smoker. (chart 10) Although erratic, it seems that disease incidence is increasing among non-smokers. Spencer found that 90.47% (171 in out of 189) of patients were

Positivity of biopsy for H pylori is approximately double in endoscopic antral biopsy as compared to open marginal biopsy (23 patients whom peroperative marginal biopsy was negative having positive biopsy when taken endoscopically)

BIOPSY	POSITIVE (IN OUT OF 70)	%
PER-OPERATIVE (marginal biopsy)	25/70	35.7
POST-OPERATIVE (endoscopic antral biopsy)	48/70	68.57

Chart 8 - Positivity of H. pylori in per operative and postoperative biopsy

smokers (15). It has been conclusively shown that smoking delays healing and promotes recurrence of previously healed ulcer (Bailey & Love).

Out of 70 patients 19 (27.14%) patients were drinker

and 51 (72.86%) patients were non drinker. (chart 11) Although alcohol is always mentioned as a cause of peptic ulcer no study so far shows any definite association between alcohol intake and peptic ulcer disease

H/O NSAIDS	NUMBERS	%
NEGATIVE	42	60
POSITIVE	28	40

History Of NSAIDS Intake

Chart 9 - Patients with H/O NSAIDS Intake

H/O SMOKING	NUMBER	%
PRESENT	22	31.42
ABSENT	48	68.57

Chart 10 - Patients with cigarette smoking

H/O ALCOHOL	Total	%
NON ALCOHOLIC	51	72.85%
ALCOHOLIC	19	27.14%

Chart 11 - Patients with alcohol drinking

Economic status	Total	%
High	4	5.71%
Middle	20	28.57%
BPL	46	65.71%

% of patients with different socioeconomic classes

Chart 12 - Patients with different economic status

(Shwartz 8th ed, 958). Walker Hall and Wolf both have reported that third of patients gave history of alcohol consumption (16). In our study there is no increased incidence of peptic ulcer perforation in alcoholic group than non-alcoholic group, so we could not ascribe a cause for this in our study.

Out of 70 patients 46 (65.71%) patients were belonging to poor economic status and 20 (28.57%) were belonging to Middle Class and only 4 (5.71%) patients were belong to high class. (Chart 12) So, in our study it seems that peptic ulcer perforation are more common among poor socioeconomic group patients. This fact is validated from other studies, which have shown similar association. Harrison says that poor socio economic status and low education promote higher colonization rate of H. pylori.

In our study 38 (54.28%) patients out of 70 patients were vegetarian and 32 (45.72%) out of 70 patients were non vegetarian (table 6), so no conclusive evidence can be drawn from these data. As mentioned in Harrison 16th ed. 1751, no diet relation has been established with peptic ulceration. In our study 43 (61.42%) patients were active workers and 27 (38.58%) out of 70 were sedentary workers. (table 8) So we can conclude that peptic perforation is more common in active workers. Ingrain and Ervin found that 59.9% (79 of 132 patients) were hard labourers (17).

In our study only 18 patients were educated above

10th class rest 52 patients (74.28%) were poorly educated. So from these data it seems that perforated peptic ulcer is more common in poorly educated. In our study 55 (78.58%) were rural and rest of 15 (21.42%) were urban residents. (table 9) So, from above data's can be safely said that in Bhopal region the perforation is more common in rural areas with poor economic status and poor education status.

In our study only 4 (5.7%) patients suffering from tuberculosis, rest were non tubercular. In this study 8 (11.4%) patients were hypertensive and 62 (88.6%) patients were normotensive. In study 4 patients were suffering from Ischemic heart disease and 2 from

Table 10 - Complications which were seen in the study

Complication	Incidence (no of pt /70)
Wound infection	15
Wound dehiscence	11
Urinary tract infection	9
Pneumonia	8
Suture leak	3
Sepsis	2
Fistula	1
Biliary leak	1
Abscess formation	0
Bleeding	0
Stroke	0
Death	0

Life Style	Total	%
Active Workers	43	61.42
Sedentary Workers	27	38.58

Active Workers Vs Sedentary Workers

Chart 13 - Patients with different life style

Number of cases	Total (70)	%
GP	56	80%
DP	14	20%

Gas. Perfo. - Vs - Duo. Perfo.

Chart 14 - Patients with duodenal perforation & gastric perforation

Diabetes mellitus. (table 7) So from above mentioned data's it seems that these disease have nothing to do with perforated peptic ulcer then from general population.

Out of 70 patients, size of perforation in patients is less than 1 cm 24 (34.28%) patients, 1 to 2 cm is 42 (60%) and only 4 (5.72%) patients have size of perforation is more than 2 cm. (table 1)

In this study all the cases were having gas under diaphragm in there, X-ray abdomen erect view. In one study conducted in J.L.N Medical College Ajmer 8 of 25 patients plain skiagram abdomen in erect view did not demonstrated free gas under diaphragm.

The demonstration of pneumoperitonium following perforated viscous is however not invariable and most series show that in only 75-80% of perforation free gas is demonstrated (18).

We found 68.57 % (48 out of 70 cases) patients of peptic perforation were positive for H. pylori. The positivity of H pylori in Gastric perforation was 71.42% (40 in out of 56) and in Duodenal perforation the positivity of H pylori was 57.14% (8 out of 14).

Highly variable percentage is reported in literature ranging from 0-92%.

Reinbach et reported 47% positivity for H. pylori

(19), Sebastian et al reported 83 % (20), Debonjie et al reported 56 % (21), Chowdhary et al reported 0 % (22), Chu et al reported 47% (23), Sharma et al reported 61% (24), Metzger et al reported 73 % (25) Kumar et al reported 50% (26) Papaziogas B, Pavlidis T, et al reported 62.5% (27) and Ng, Enders K.W.MD, LAM, Y.H. MD et al reported a prevalence of 81% in perforated peptic ulcer.

Discrepancy between H. pylori infection rate found in different studies may be attributed in part to different population studied.

Enderson et al (2000) also found that simple closure with H. pylori eradication is a useful as any of the definitive surgery in preventing recurrence of ulcer. Donovan et al recommended H. pylori eradication to those who are infected with H. pylori along with simple closure. In our study results are different form the other mentioned studies, quoted above.

So it can be stated that perforated Gastro duodenal ulcer are clearly associated with H. pylori infection as a strong etiological factor and H. pylori infection status should be assessed at the initial endoscopy or operation, regardless of concomitant NSAID intake. If H. pylori infection is found, an appropriate eradication therapy should be initiated as soon as possible as not

only it is beneficial for eradication of H. pylori but it is also valuable in prevention of ulcer recurrence.

SUMMARY AND CONCLUSION

1. Most common perforation was Gastric perforation (80%) and commonest age of perforation was 46-55 years, men were more affected than females with the ratio of 3:15. Most common size of perforation was between 1-2 cm in 60% patients and most common site of perforation was prepyloric region in 38 (54.28%) patients followed by pyloric region then Duodenum.
2. Most of the patients were from poor economic status 46 (65.71%) and only 4 (5.71%) patient from high class. Most of the patients were residing in rural area 55 (78.58%) and mostly poorly educated (74%).
3. According to study 28 patients (40 %) were taking NSAIDS, (31.42%) were smokers, 19 patients (27.14%) were taking alcohol. So smoking, alcohol, NSAIDS & steroids all are considered as risk factors for ulcer perforation.
4. In study 38 (54.28%) patients were vegetarian and most of the patients (61.42%) were active workers. Family history was not significant in any patient.
5. Only 4 (5.72%) patient were tubercular and only 2 (2.86) patients were diabetic. Most of the patients - 62 (88.6%) were normotensive and 8 (11.4) patients were hypertensive. So these factors are not much related with perforation.
6. On abdomen erect X-Ray film - Gas under the diaphragm was a significant finding.
7. The most common complications were wound infection, wound dehiscence, UTI, and chest complications.
8. The mortality rate and complications increased with increasing age, presence of other co-morbid conditions, presence of shock at time of admission and delay in surgery after perforation. The average period of hospitalization was 9 days for perforation patients.
9. Most of the patients - 48 (68.57%) were having H. pylori, detected on biopsy staining by H & E and Giemsa stain. Positivity of H. pylori in gastric perforation was 71.42% and in duodenal perforation it was 57.14%. So it can be concluded that H. pylori may be the causative factor for gastro-duodenal perforation.
10. Study shows that in all factors studied H. pylori

was most closely associated factor with perforation.

11. Less than 10% of patients, who on discharge were prescribed Anti H. pylori kit, had recurrence of ulcer. Thus, H. pylori eradication helps ulcer healing and reduces the incidence of perforation and ulcer recurrence after simple closure of the perforation.

So by the end of this study following conclusion was drawn

H. pylori is strongly associated with gastroduodenal perforation, (48/70) 68.57% patients were positive for H. pylori. Gastric perforation was more common than duodenal perforation and prepyloric region was commonest site in this study. Male to female ratio was about 3:1 and most common age group was 46- 55 years. NSAIDS, smoking, alcohol, steroids and stress were the other important risk factors associated with gastroduodenal perforation. For H. pylori detection, biopsy and staining was a good method. Early Anti H. pylori therapy (triple eradication therapy) for patients of gastroduodenal perforation who were positive for H. pylori, provide a excellent cure after simple closure.

In summary our study clearly shows that perforated gastroduodenal ulcer are associated with H. pylori infection as a strong etiological factor and H. pylori infection status should be assessed at the initial endoscopy or operation, regardless of concomitant NSAID intake. If H. pylori infection is found, an appropriate eradication therapy should be initiated as soon as possible, as not only it is beneficial for eradication of H. pylori but it is also valuable in prevention of ulcer recurrence.

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