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RISK FACTORS AFFECTING PEPTIC ULCER PERFORMATION

General Surgery

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ABSTRACT

Introduction: Peptic ulcer is a sore in the lining of stomach or the first part of the duodenum. Peptic ulcer perforation with subsequent peritonitis is commonest complication of peptic ulcer disease and is a surgical emergency. It carries with it great morbidity and mortality. **AIMS:** To study the risk factors associated with peptic ulcer perforation in our setting. **Objectives:** To Assess the role of various risk factors like age, sex, previous use of NSAIDS, Smoking & other associated illness. To study the risk factors that affect operative outcome in peptic perforation peritonitis. **Materials & Methods**: All patients of peptic ulcer with perforation peritonitis on laparotomy are included in the study.Patients with peptic ulcer Perforation of age > 14 years. **Results**: Duodenal perforations were present In 69 cases out of 100 cases (69%). Gastric perforation was present in 31 cases (31%). In gastric cases 30 perforations were present on lesser curvature and pyloric Antrum and one perforation was present on posterior wall of stomach. **Discussion:** Present clinical study of peptic perforation has been carried out to find out various risk factor associated with It's occurrence, investigation, clinical picture, preoperative findings and post operative outcome and recurrence of perforation after taking Anti H. pylori regime was observed. **Conclusion:** In my study that H.pylori infection, smoking, use of NSAID's is significant risk factor on peptic perforation

KEYWORDS

Peptic perforation, Omental patch, Laparotomy

INTRODUCTION

Peptic ulcer is a sore in the lining of stomach or the first part of the duodenum. Peptic ulcer perforation with subsequent peritonitis is commonest complication of peptic ulcer disease and is a surgical emergency. It carries with it great morbidity and mortality.

Peptic ulcer diseases result from a imbalance of acid secretion & mucosal defence that resist acid digestion. In the eighteenth century peptic ulcer was a rare occurrence. Thus Albertus mentioned; perforation as a cause of sudden death is a rare condition, but now peptic perforation is quite a common surgical emergency.

The incidence of ulcer perforation is 7 to 10 in 100,000 populations per year. Pyloro-duodenal perforations are 6 to 8 times more common than gastric perforations. The site of pyloro-duodenal perforation is usually the anterior wall, where as the majority of gastric perforation are located on the lesser curvature[5].

In addition to these common sites perforation can also occur at the stoma after gastro jejunostomy.

Risk factor that increase the chances of peptic ulcer disease and subsequent perforation:

1) Helicobacter pylori bacterial infection.
2) Non steroidal anti-inflammatory drugs - which hinder the body's ability to protect the stomach lining.
3) Disease that causes an increase in acid production such as Zollinger Ellison syndrome.
4) Other causes- Cigarette smoking, alcohol abuse, trauma, head injury, shock and burns.

Perforation is more common in men than in women (4.8:1), although this ratio appears to be changing as the frequency of gastric perforation is increasing due to non steroidal anti Inflammatory drugs use in elderly women.

The most common presentation is an abrupt onset of severe abdominal pain followed rapidly by sign's of peritoneal inflammation. The pain typically begins in the epigastrium and rapidly spreads throughout the abdomen. The abruptness, severity, and rapid progression of symptoms convince the patient that some thing bad has happened, and there is usually little delay in seeking medical attention.

The age and condition of the patient at the time of admission or operation are the primary determinants of survival.

Prospective studies have confirmed that major medical disease, preoperative shock, and a perforation present for more than 48 hours are independent risk factors, all predicting poor outcome. Those with all risk factors have markedly high risk of dying.

Old age, extensive peritoneal contamination, and a short history of ulcer before surgery are also important but are not independent factors. An elevated serum creatinine in patients without chronic renal failure is also a sign of poor prognosis. The mortality rate for high risk patients under going surgery is extremely high[35].

AIMS

1. To study the risk factors associated with peptic ulcer perforation in our setting.

OBJECTIVES

1. To Assess the role of various risk factors like age, sex, previous use of NSAIDS, Smoking & other associated illness.
2. To study the risk factors that affect operative outcome in peptic perforation peritonitis.
3. To assess postoperative complications in operated cases of peptic ulcer perforation.

MATERIALS & METHODS

Study Design : Hospital based observational Study
Period of Study : January 2017 to June 2018
Place of study : Department of Surgery, Mahatma Gandhi Medical College & Hospital, Jaipur (Rajasthan)
Study Group : All patients of peptic Perforation admitted from January2017 – June 2018.

INCLUSION CRITERIA

- All patients of peptic ulcer with perforation peritonitis on laparotomy are included in the study.
- Patients with peptic ulcer Perforation of age > 14 years.
- Patients who will undergo simple closure with Omental Patch as standard operative procedure.

EXCLUSION CRITERIA

- Patients with Perforation of peptic ulcer origin at jejunum , ileum

adjacent to Meckel's diverticulum.
- Patients treated with conservative management
- Patients who will undergo Vagotomy with Gastrojejunostomy with simple closure or partial Gastrectomy or Pyloroplasty.
- Patients presenting as recurrent Perforation or Stomal ulcer Perforation.

Patients are given general anesthesia. A midline laparotomy incision is given and the operative findings are noted. Degree of contamination, size and site of the perforation are noted. A simple suture repair with Grahm's omental patch is done in all cases. A gastro-jejunostomy and feeding jejunostomy is added if the margins of perforation are oedematous or not likely to hold sutures strongly. Peritoneal cavity is irrigated withnormal saline and abdominal drains inserted through separate stab wounds into pelvis and morrison's pouch. Abdomen is closed in layers.

Appropriate Statistical test will be used to find Significant bservation. p value< 0.05 will be considered Statistically Significant.

RESULTS

Type of perforation	No. of cases	Percentage
Duodenal perforation	69	69%
Gastric perforation	31	31%
a) On Lesser curvature including pyloric antrum	30	30%
b) On posterior wall	1	1%

Duodenal perforations were present In 69 cases out of 100 cases (69%). Gastric perforation was present in 31 cases (31%). In gastric cases 30 perforations were present on lesser curvature and pyloric Antrum and one perforation was present on posterior wall of stomach.

Relation with the H. pylori bacterial infection

Type of Perforation	Total no. of cases	H. pylori positive	H. pylori negative
Duodenal perforation	69	58 (84.06%)	11 (15.94%)
Gastric perforation	31	20 (64%)	11 (36%)
Total	100	78 (78%)	22 (22%)

Above table shows that H. pylori was positive in 78% cases of peptic perforation and in 22% cases in H. pylori was negative. In our case series the ratio is 3.5:1.

In duodenal perforation the H. pylori positive vs. H. pylori negative ratio is 5.6:1 (H. pylori positive cases are more prone to duodenal perforation)

In gastric perforation the H. pylori positive versus H. pylori negative ratio is 1.8:1 (H. pylori positive cases are less prone to gastric perforation as compared to duodenal perforation).

Relation with the Smoking

Type of Perforation	Total no. of cases	History of Smoking	No History of Smoking
Duodenal perforation	69	47 (68.11%)	22 (31.89%)
Gastric perforation	31	23 (77.41%)	8 (22.49%)
Total	100	70 (70%)	30 (30%)

The above table Depicts that smoking is an important contributing factor in peptic perforation the ratio is

	Smoker	:	Non Smoker
Duodenal	2.3	:	1
Gastric	3.44	:	1
TOTAL	2.30	:	1

The peptic perforation is more common in smoker as compared to the non smoker. The ratio of smoker: non smoker is 2.3:1 in our series of peptic perforation cases.

The relation to non steroidal anti inflammatory drugs (NSAID's)

Type of Perforation	Total no. of cases	History of NSAID's Present	No History of NSAID's
Duodenal perforation	69	51(73.91%)	18(26.09%)
Gastric perforation	31	25 (80.64%)	6 (19.35%)
Total	100	76 (76%)	24 (24%)

NASID is an important contributing factor in the occurrence of peptic perforation. It is scene from the above table that 76% of cases were taking NSAID, the ratio is.

	NSAID's Group	:	Non NSAID's Group
Duodenal	2.83	:	1
Gastric	4.16	:	1
TOTAL	3.16	:	1

The perforation is higher in NSAID's users as compared to patients not taking NSAID's. The NSAID's user group and non NSAID group ratio is 3.16:1 in our series of peptic perforation cases.

Relation with the Socioeconomic status

Type of perforation	Total No. of cases	Low socioeconomic group	High socioeconomic group
Duodenal	69	52 (75.36%)	18 (24.64%)
Gastric perforation	31	18 (58.06%)	13 (38.94%)

The above table shows the percentage of cases in relation to socioeconomic status in the society.

Low socioeconomic group	:	High socioeconomic group
Duodenal - 2.88	:	1
Gastric - 1.38	:	1

Above table show duodenal perforation is more common in lower socioeconomic group as compared to gastric perforation. This is a biased study because in our institution most of the cases belong to lower socioeconomic status at large.

Factor which is affect the peptic ulcer perforation

Factor	Total no. cases	Factor present	Percentage
H. pylori+ NSAID's + smoking	100	30	30
H. pylori + NSAID's	100	22	22
H. pylori + smoking	100	17	17
Smoking + NSAID's	100	15	15
NSAID's alone	100	8	8
H. pylori alone	100	6	6
Smoking alone	100	1	1
None	100	1	1

This table'shows comparative study of different risk factor which may lead to perforation. It was seen that 30% of the perforation cases had all three factors present like H.pylori infection NSAID's intake and history of smoking. In 22% cases only H.pylori and intake of NSAID's was present. In 17% H.pylori and smoking was present. In 15% cases only intake of NSAID's and history of smoking will present.while in 8% cases only history of NSAID's intake was present. In 6% cases only H.pylori infection was present while in 1% cases only history of smoking was there. But in 1% cases there was no history of the above risk factors.

Size of peptic perforation

Type of perforation	Total patients	Size of perforation		
		< 0.5 cm.	0.5 to 1 cm.	>1 cm.
Duodenal	69	40 (57.97%)	24 (34.78%)	5(7.24%)
Gastric	31	15 (48.38%)	12 (38.70%)	4 (12.90%)
Total	100	55 (55%)	36 (36%)	9 (9%)

In our study 9% cases had peptic perforation of more than 1 cm. Size and 36% cases were between 0.5 to 1 cm. size and 55% cases were less than 0.5 cm. size.

H. pylori infection incidence of Mortality and Morbidity

H. pylori infection	Total patients	Mortality		Morbidity (leakage)	
		No. of patients	Percentage	No. of patients	Percentage
Positive	78	6	7.69%	2	2.56%
Negative	22	1	4.54%	0	0%

In our study 78% patients were of H. pylori positive group and 22% patients were of H. pylori negative group. Mortality rate was much higher (7.69%) in the H. pylori positive group in comparison to H. pylori negative group 4.45%. the morbidity leakage was also more higher 2.56% in H pylori positive group in comparison to H. pylori negative group 0%.

Morbidity (leakage) in relation between sizes of perforation

Size of Perforation	No. of Leakage Peptic perforation	Percentage
<0.5 cm.	0/55	0%
0.5 to 1 cm.	0/36	0%
> 1 cm	2/9	22.22%

Figure Left to oblique line, denotes no. of leakage and figure right to oblique line shows no. of peptic perforation cases.

This table shows that the leakage rate increased with the increase in the size of peptic perforation

Age: - incidence of Mortality and Morbidity

Age in Year	Incidence	Mortality		Morbidity	
		No. of Petients	Percentage	No. of patients	Percentage
< 60 yrs	14	3	21.4	6	42.8
< 60 yrs	86	4	4.7	16	19.2

In our study 14% patients were more than 60 years of age and the rest 86% patient of the patient were less than 60 years of age. The Mortality rate was much higher (21.4%) in the age group of more than 60 year age compared to less than 60 year of age group (4.7%). The Morbidity was also two time more higher in age group of more than 60 year (42.8%) as compared to patient of less than 60 year of age (19.2%).

Shock:- Related Mortality and Morbidity

Clinical parameters	No. of patients	Mortality		Morbidity	
		No. of patients	Percentage	No. of patients	Percentage
Preoperative shock systolic BP < 100mmHg	20	5	25%	8	40%
Systolic BP > 100mmHg	80	2	2.4%	14	8%

In our study 20% patients preoperative systolic BP was < 100 mmHg while in 80% of the patients systolic BP was > 100 mmHg.

Mortality rate was higher in patients whose systolic BP was < 100 mmHg 25% in comparison to patient whose systolic BP was > 100 mmHg 2.4%.

Morbidity rate was also higher (40%) in patients whose systolic BP was < 100 mmHg in comparison to patients whose systolic BP was > 100 mmHg to 8%.

Table show the post operative complication

Complication	Peptic perforation	Percentage
Wound infection	8	8
Respiratory	5	5
Post operative intestinal obstruction SAIO	2	2
Renal failure	1	1
Leakage of perforation-	2	2
Thrombophlebitis	1	1
Hypoxic encephalopathy	1	1
Bed sore	1	1
Urinary incontinence	1	1
Brust abdomen	-	-
Foecal fistula	-	-
Total	22	22

The most common complication was wound infection in 8% patient. This was followed by respiratory complication in 5% cases post operate intestinal obstruction 2% cases, leakage of perforation in 2% cases, renal failure in 1% cases rest o the complications were thrombophlebitis, bed sores, and urinary incontinence and hypoxic encephalopathy.

DISCUSSION

Present clinical study of peptic perforation has been carried out to find out various risk factor associated with It's occurrence, investigation, clinical picture, preoperative findings and post operative outcome and recurrence of perforation after taking Anti H. pylori regime was observed.

Peptic perforation is an important and common abdominal emergency affecting human beings from the time immemorial. As far as incidence is concerned it comprises of about 33% of all acute abdominal emergencies (Som 1953).

In our series 100 cases of peptic perforation were study the perforation was located at duodenal in 69% cases and 31% cases it was gastric. The same findings were observed by Ball et al in 1989 he found 72.22% of perforations in duodenum and rest in the stomach.

In our study occurrence of peptic perforation was maximum in the age group above 50 years (34%). This is not similar to previous studies Udwadia (1963) and Bhanshali (1967) and Budhraja (1973). The maximum incidence was in fourth decades. In our study the high incidence in older age group could be due to long duration of associated risk factors like smoking and NSAID' s use.

In our study peptic perforation is more common in males as compared to female we have observed M:F ratio is 11.50:1. Gillium Alfaca et al 1992 reported that 93%of the cases of peptic perforation were male and Salley S Matingly et al 1980reported that the incidence in male was 88%and Johon Boey et al (1982) also had an incidence of 85% in male in case of peptic perforation peritonitis. The higher incidence in male could be because of relatively stressful life of males as compared to females. The incidence of acid peptic disease was also more common in males. Gastric perforation were more common in females (out of 8 females 3 females were having gastric perforation).

In our study the peptic perforation is more common (78%) in previously H. pylori positive patients as compared to H. pylori negative (22%) patients.

In our study Prevalence of H. pylori infection in patient with perforated peptic ulcer was 78% this finding is almost comparable to Sebashin et al 1995 (83%) and Ng 18 et al 1996 (70%) and Ng (4) et al 2000 (81%). This is in contras to Chaudhary et al 1998 (0%) and Chu et al 1999 (47%).

The prevalence of H. pylori infection is more common (84.06%) in duodenal perforation as compared the gastric perforation 64%.

Gastric ulcerogenesis is as a result from the action of bacterial urease, which generates ammonia and protease, which breaks down glycoprotein in the gastric mucosa. Damage to protective mucous layer exposes the underlying epithelial cell to the damaging influence of acid peptic digestion and may thus lead to inflammation. The chronically inflamed mucosa is more susceptible to acid peptic injury and is thus more prone to peptic ulceration. This sequence of events may explain why gastric ulcers are so frequently located in the sites of chronic inflammation, such as the antrum. Gastric ulcers frequently occur at the junction of antral and body-fundic mucosa that is, the division between inflamed antral mucosa and normal acid secreting mucosa. In case of pan gastritis the more extensive gastritis the more proximal is the gastric ulcer. Proximal gastric ulcers also occur with increased frequency in elderly. Coinciding with the proximal migration of the antral body mucosal junction with age.

In our study peptic perforation was more common (70%) in smokers as compare to non smoker (30%). The gastric perforation was more common (77.41%) then the duodenal perforation (68.11%) in smokers. Smoking impairs healing of ulcer and favor recurrence of ulcer and subsequent perforation possibly by suppression of mucosal prostaglandin synthesis.

In our study peptic perforation was more common (76%) in NSAID's uses as compare to non NSAID's user is 24%. These finding almost comparable to Tayside et al 1998 (74%) and Odense et al 2001 (75%). The incidence in our state is similar to western countries. The gastric perforation was more common (80.64%) than the duodenal perforation (73.91%) in NSAID's users.

In our study peptic perforation is common with the association of risk factor. It was seen that 30% of the perforation cases had all three factors present like H.pylori infection NSAID's intake and history of smoking. In 22% cases only H.pylori and intake of NSAID's was present.In 17% cases H.pylori infection and smoking present. In 15% cases only intake of NSAID's and history of smoking will present while in 8% cases only history of NSAID's intake was present in 6% cases only.

In our study 9% cases had peptic perforation of more than 1 cm size and 36% cases were between 0.5 to 1Cms size and 55% cases were less than 0.5 cm size.

In our study 78% patients were of H. pylori positive group and 22% patients were of H. pylori negative group. Mortality rate was much higher (7.69%) in the H. pylori positive group as comparison to H. pylori negative group 4.45%. the morbidity leakage was also more higher 2.56% in H pylori positive group as comparison to H. pylori negative group 0%.

In our study shows that the leakage rate increase with the increase in the size of peptic perforation this was highest (22.22%) when the size of perforation s was more than 1 cm and lowest 0% when the size of perforation less than 0.5 cm.

In our study mortality rate was (21.4%) in older age group patients (> 60 years) table no. 9 John J. Ferrare (1985) reported 52% mortality rate. Coustojoides (1926) reported 22% mortality rates in patients > 60 years of age. This disparity probably reflects varying proportion of risk factor that patient has in individual series. In our study operative mortality is about 5 times higher in older patient as compared to younger patients. This finding similar to other worker's studies (David V. Felliciano et al 1984, John J. Farrare et al 1985).

In our study operative morbidity was 42.8% in patients' age more than 60 years. This is slightly differ from other workers study of 31% (John Boey et al 1982) and 28% morbidity reported by (Som S. Salley et al 1980) in patient of > 60 years of age. This view has supported by John Boey (1982) who reported that age did not affected mortality and morbidity in absence of independent risk factor like (preoperative shock, major medical illness and duration of perforation > 48 hours).

Our finding that operative mortality and mortality increases with old age is almost similar to other studies.

CONCLUSION

In my study that H.pylori infection, smoking, use of NSAID's is significant risk factor on peptic perforation.

Use of NSAIDs was seen in 71% cases, smoking in 65% cases & H.pylori infection was seen in 60% cases.

Low socioeconomic status, old age, pre-operative shock, duration of perforation > 48 hours is significant risk factor that enhances the operative mortality and morbidity in peptic perforation peritonitis.

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