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Original Research Article

A Clinical-Epidemiological Study Assessing Outcome of Patients with Acute Perforated Peptic Ulcer

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Abstract

Aim: The aim of the present study was to evaluate the different pattern of risk factors, clinical presentations, management and clinical outcome of patients with acute perforated peptic ulcer.

Methods: This was a hospital based prospective observational study conducted in the Department of General Surgery, Shri Ramkrishna Institute of Medical Sciences, Durgapur, West Bengal, India for the period of 1 year. Total 100 patients were included in this study.

Results: Among study subjects the mortality rate was 20% (20 cases) and 80 (80%) were survivors. The mean age of study subjects with perforated peptic ulcer was 52.68±16.44 years. The mean age of survivors was 48.82±14.66 years and for non survivors it was 68.62±12.68 years. Among study subjects 62 were males and 38 were females. Among non-survivors 12 were male and 8 were females. Whereas among survivors 50 were males and 30 were females. Among study subjects the most common risk factor seen was alcohol (68%) followed by smoking, peptic ulcer disease and NSAIDs ingestion whereas the most common presentation was abdominal pain (100%) followed by signs of peritonitis (88%), abdominal distension (84%), severe nausea (49%) and vomiting. In present study among cases most common Post operative complication was SSI (41%) followed by pulmonary infection (14%), post operative sepsis (10%), burst abdomen/wound dehiscence (5%) and fistula formation (2%). The relative risk is maximum in APACHE 2 score >25 (7.4) followed by in group with APACHE 2 score 21-25 (6.84), APACHE 2 score 16-20 (3.7), APACHE 2 score 6-10 (0.85), APACHE 2 score 11-15 (0.38), APACHE 2 score 0-5 (0.07).

Conclusion: The present study concluded that perforated PUD is a life- threatening disease with high morbidities and mortalities. Male predominance was seen due to smoking and alcohol consumption. Pain in abdomen and abdominal distention were the common symptoms. Hospitalization stay was high among survivors. Mortality was higher as the age increases and late presentation and initiation of treatment increases risk of mortality. Higher APACHE 2 score was useful in assessing the risk of mortality.

Keywords: Peptic ulcer disease, Perforated, APCHE 2 score, Abdominal pain, Smoking

Introduction

Peptic ulcer disease (PUD) affects 4 million people globally each year. The incidence of PUD has been estimated to be between 1.5 and 3%. Perforation occurs in roughly 5% of PUD patients during their lifetime. Perforated peptic ulcer is a common surgical emergency condition worldwide, which is associated with significant morbidity and mortality if early diagnosis and immediate surgical management were not carried out, having a mortality rate that ranges from 1.3 to 20%. [1] PUP is characterized by the classic triad of abrupt abdominal discomfort, tachycardia, and abdominal tenderness. "I hardly believe that anybody can fail in establishing a diagnosis," Edward Crisp mentioned in 1843. [2] Young age-group distribution is commonly seen in the developing world, which is mostly predisposed by smoking. With the advanced age in developed countries, these patients tend to be elderly with multiple comorbidities and associated use of NSAIDs, Helicobacter pylori, physiological stress, corticosteroids, and previous history of PUD are risks factors for PUP. [3,4]

Mortality risk was associated with age more than 60 years, shock (systolic pressure < 90 mmHg) at presentation, and delayed presentation (more than 24 h before surgery). Early diagnosis, prompt resuscitation, and urgent surgical intervention are essential to improve outcomes. [5] According to the

diagnostic value of radiological investigation, 75% of patients with perforated peptic ulcer free air under the diaphragm were detected on erect chest/abdominal X-ray. In comparison with a computed tomography scan which reveals superior diagnostic accuracy of 98%, a CT scan can help to distinguish other mimicking differential diagnoses of the acute abdomen like acute pancreatitis that would not require surgical intervention; the utility of this CT scan is justified when the clinical presentation is not specific to upper gastrointestinal pathology or malignancy is suspected and patients' hemodynamic is not deranged. [6]

Exploratory laparotomy and omental patch repair remain the gold standard. Laparoscopic surgery should be preserved in the early presentation of disease and diminished associated complications. Definitive anti-ulcer surgery is significantly associated with fatal outcomes in these patients, while it increases the length of the operation, exposes the patient to prolonged anesthetic time, and increases the chance of postoperative complications. Gastrectomy is recommended in patients with a large or malignant ulcer. [7,8]

The aim of the present study was to evaluate the different pattern of risk factors, clinical presentations, management and clinical outcome of patients with acute perforated peptic ulcer.

Materials and Methods

This was a hospital based prospective observational study conducted in the Department of General Surgery, Shri Ramkrishna Institute of Medical Sciences, Durgapur, West Bengal, India for the period of 1 year. Total 100 patients were included in this study. All the patients presenting Shri Ramkrishna Institute of Medical Sciences, Durgapur, West Bengal, India with symptoms and signs suggestive of Perforation peritonitis, confirmed to be perforated peptic ulcer intraoperatively were taken as study subjects. Cases of peptic perforation with associated trauma were excluded from the study.

Procedure

The diagnosis of generalized peritonitis was made from history and physical examinations alone, but in some cases, plain abdominal, chest radiographs as well as ultrasound scans of abdomen and pelvis was used as ancillary support to clinical findings. Diagnosis was confirmed on laparotomy.

Patient management

Preoperatively, blood samples were routinely taken for full blood count, electrolyte, urea and creatinine, grouping, ABG analysis, urinalysis and cross-matching and chest radiographs was also done. On admission, after confirmation of perforative peritonitis, adequate resuscitation was achieved with intravenous fluids, intravenous antibiotics (third generation cephalosporin plus metronidazole) and nasogastric tube suction to decompress the stomach. Urinary output of >30 ml/h indicated adequate hydration and resuscitation. After adequate resuscitation, laparotomy was performed utilizing a midline incision. Exploration was carried out to identify the site of perforation, to estimate the size and also the volume and nature of peritoneal exudate. In case of gastric perforation, Graham's omentopexy done and the duodenal perforation was closed with interrupted 2/0 vicryl sutures tied over pedicled omentum (Graham's omentopexy). Liberal peritoneal wash out was done with copious volumes of warm normal saline. Intra-abdominal drain was left in-situ and abdomen closed with mass suture utilizing No 2 Nylon sutures. Most of the surgical operations were performed by consultant surgeons, and others by senior Residents under the supervision of the consultant surgeons. All patients received intravenous fluids, continued nasogastric tube suction until bowel sounds returned and oral feeding commenced. In addition, all patients received intravenous antibiotics utilizing third generation cephalosporin and metronidazole infusion for a period ranging from four to six days postoperatively Patients were discharged home on omeprazole, metronidazole and amoxicillin in all H. pylori positive patients for 14 days. Patients were followed up for 3 weeks.

Data Collection

A specially designed proforma was used to collect information on patients' demographics, pattern of presentation which include duration of abdominal pain at presentation and other associated symptoms, previous history of dyspepsia, medical comorbidity, risk factors like cigarette smoking, alcohol intake and non-steroidal anti- inflammatory drugs (NSAIDs) use. The outcome measures included the duration of hospital stay, number of postoperative complications, number of patients discharged and mortalities.

Statistical Analysis

The data collected were analyzed using statistical package for social sciences (SPSS) version 20. Data was presented in frequency and percentages. Continuous and categorical variables were analyzed by student t test and chi-Square respectively. A p value <0.05 was considered statistically significant.

Results

Table 1: Age wise distribution among study outcomes

Age (years)		Non survivor	Survivor	Total	P value
20-30	N	0	15	15	0.086
31-40	N	2	20	22	0.31
41-50	N	0	14	14	0.07
51-60	N	4	16	20	0.5
61-70	N	4	6	10	0.46
>70	N	10	9	19	<0.001
Total	N	20	80	100	0.042
Sex					
Male	N	12	50	62	
Female	N	8	30	38	0.032
Total	N	20	80	100	

Among study subjects the mortality rate was 20% (20 cases) and 80 (80%) were survivors. The mean age of study subjects with perforated peptic ulcer was 52.68±16.44 years. The mean age of survivors was 48.82±14.66 years and for non survivors it was 68.62±12.68 years. Among study subjects 62 were males and 38 were females. Among non-survivors 12 were male and 8 were females. Whereas among survivors 50 were males and 30 were females.

Table 2: Risk factors, clinical presentations and post operative complications among study subjects

Parameters	N	%
Risk factors		
Peptic ulcer disease	35	35
NSAIDs	30	30
Alcohol	68	68
Smoking	52	52
Clinical presentation		
Abdominal pain	100	100
Severe nausea	49	49
Vomiting	27	27
Abdominal distension	84	84
Signs of peritonitis	88	88
Post operative complication		
None	50	50
SSI	41	41
Pulmonary infection	14	14
Post operative sepsis	11	11
Fistula formation	2	2
Burst abdomen/wound dehiscence	5	5

Among study subjects the most common risk factor seen was alcohol (68%) followed by smoking, peptic ulcer disease and NSAIDs ingestion whereas the most common presentation was abdominal pain (100%) followed by signs of peritonitis (88%), abdominal distension (84%), severe nausea (49%) and vomiting In present study among cases most common Post operative complication was SSI (41%) followed by pulmonary infection (14%), post operative sepsis (10%), burst abdomen/wound dehiscence (5%) and fistula formation (2%).

Table 3: APACHE 2 score and mortality assessment among study subjects

APACHE score	Not survived	Survived	P value
	N	N	
0-5	0	35	0.072
6-10	0	25	0.07
11-15	2	15	0.32
16-20	8	4	0.0065
21-25	6	1	<0.01
>25	4	0	<0.01
Total	20	80	-

The relative risk is maximum in APACHE 2 score >25 (7.4) followed by in group with APACHE 2 score 21-25 (6.84), APACHE 2 score 16-20 (3.7), APACHE 2 score 6-10 (0.85), APACHE 2 score 11-15 (0.38), APACHE 2 score 0-5 (0.07).

Discussion

Peptic ulcer disease (PUD) results from an imbalance between stomach acid-pepsin and mucosal defence barriers. It affects 4 million people worldwide annually. [9] The incidence of PUD has been estimated at around 1.5% to 3%. [10] Although 10%-20% of patients with PUD will experience complications, only 2%-14% of the ulcers will perforate causing an acute illness. [11,12] Perforation is a serious complication of PUD and patients with perforated peptic ulcer (PPU) often carries high risk for morbidity and mortality. [13]

Among study subjects the mortality rate was 20% (20 cases) and 80 (80%) were survivors. The mean age of study subjects with perforated peptic ulcer was 52.68±16.44 years. The mean age of survivors was 48.82±14.66 years and for non survivors it was 68.62±12.68 years. Among study subjects 62 were males and 38 were females. Similar picture is seen in other studies done on other populations, such as Dongo et al reported M:F ratio of 3.5:1, Afuwape et al reported 4.7:1 and Chalya et al reported M:F ratio of 1.3:1. [14-16] Among non-survivors 12 were male and 8 were females. Whereas among survivors 50 were males and 30 were females. The high incidence of perforated PUD amongst young males may be due to smoking and alcohol consumption. Most patients who smoked also abused alcohol. It also causes delay in duodenal ulcer healing. [17] Among study subjects the most common risk factor seen was alcohol (68%) followed by smoking, peptic ulcer disease and NSAIDs ingestion whereas the most common presentation was abdominal pain (100%) followed by signs of peritonitis (88%), abdominal distension (84%), severe nausea (49%) and vomiting. A study in a tertiary hospital in Tanzania 85.7% use alcohol and 64.3% were smokers. A study from eastern India by Ekka et al also reported 65.73% were known smokers while 42.86% patients were admittedly alcoholics. [16,18]

In present study among cases most common Post operative complication was SSI (41%) followed by pulmonary infection (14%), post operative sepsis (10%), burst abdomen/wound dehiscence (5%) and fistula formation (2%). This data is similar to studies done by Ugochukwu et al and Rohit et al. [19,20] The relative risk is maximum in APACHE 2 score >25 (7.4) followed by in group with APACHE 2 score 21-25 (6.84), APACHE 2 score 16-20 (3.7), APACHE 2 score 6-10 (0.85), APACHE 2 score 11-15 (0.38), APACHE 2 score 0-5 (0.07). This shows the lower mortality in this group which is statistically significant. Survivors in present study has lower mean score than that of study done by Kulkarni et al (9.88) and Schein et al (8.75) whereas mean APACHE 2 score of non survivors of our study (24.07) much higher than that of studies done by Kulkarni et al (19.25) and Schein et al (14.5). [21,22] Statistically, mean values are highly significant ($p<0.0001$) thus showing that higher APACHE 2 scores are associated with mortality. In present study patient with APACHE2 score >25 did not survive. When compared to other studies, Kulkarni et al study, patients above score 21 did not survive; Schein et al, patients above 21 did not survive. These scores may be cited as criterion to decide whether to operate or not operate. But, it has to be noted that APACHE 2 scoring system can be effectively used in assessment of outcome in similar type population but does not provides enough confidence to predict individual outcome. [23]

Conclusion

The present study concluded that perforated PUD is a life- threatening disease with high morbidities and mortalities. Male predominance was seen due to smoking and alcohol consumption. Pain in abdomen and abdominal distention were the common symptoms. Hospitalization stay was high among survivors. Mortality was higher as the age increases and late presentation and initiation of treatment increases risk of mortality. Higher APACHE 2 score was useful in assessing the risk of mortality.

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