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Original Research Article

A Hospital-Based Study Assessing the Association between various Preoperative Factors with Postoperative Mortality and Morbidity in Patients Operated for Peptic Ulcer Perforation

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Abstract

Aim: The aim of the present study was to evaluate the association between various preoperative factors with postoperative mortality and morbidity in patients operated for peptic ulcer perforation.

Methods: The present study was hospital based, retrospective study conducted in Department of General Surgery . Present study was approved by institutional ethical committee. 100 case records were studied. Case records of patients of either gender, age > 18 years, admitted, diagnosed with duodenal ulcer perforation and surgically treated at our hospital from last 4 years were evaluated.

Results: Majority was male (90%), most common age group was 51-60 years (38%) followed by 41-50 years (25%). Common clinical features at the time of admission were tachycardia (96%), abdominal rigidity (92%), abdominal tenderness (90%), absence of bowel sound (780%), dehydration (64%), abdominal distention (58%), anemia (32.58 %), fever (23%), manifestations of shock (16%). Duration from onset of symptoms to admission was 12-24 hours (33%) in majority of patients. Associated risk factors noted were smoking (54%), alcoholism (51%), previous history of PUD (18%), diabetes mellitus (16%), use of NSAIDs (15%) and stress (12%). Intra-operatively, perforation diameter was 1–5 mm in majority of cases (64%) followed by 6–10 mm (20%). Peritoneal contamination was < 1 litre in majority of cases (78%). Major postoperative complications in present study were respiratory complication (26%), paralytic ileus (20%), septicaemia (16%), wound infections (15%), burst abdomen (5%). Mortality in 6 months was noted in 15 cases (15%). In present study factors significantly associated with mortality were age > 60 years, septicemic shock on admission, size of perforation > 1 cm, delayed presentation > 24 hours, smoking, diabetes mellites and peritoneal contamination > 2 litre.

Conclusion: In present study factors significantly associated with mortality in patients with peritonitis due to duodenal ulcer perforation were age > 60 years, septicemic shock on admission, size of perforation > 1 cm, delayed presentation > 24 hours, smoking, diabetes mellites and peritoneal contamination > 2 litre.

Keywords: peritonitis, duodenal ulcer perforation, septicemic shock, peritoneal contamination

Introduction

Peptic ulcer disease (PUD) is a disease that results from an imbalance between aggressive factors such as stomach acid and pepsin and mucosa defense barriers. [1] Although the need for elective surgery has decreased as a result of advances in medical treatment, 10% of the patients require surgery. The choice of treatment for peptic ulcer perforation (PUP) remains to be surgery. Currently, the most preferred surgical method is simple closure and omental plug. Different techniques are also applied. [2-4] Factors that influence the prognosis of PUP are listed as follows: time to hospital presentation, large perforation diameter, age over 60 years, presence of shock, presence of concomitant diseases and localization of the perforation in the stomach. [5,6]

Perforated peptic ulcer is one of the most common surgical emergencies in South India. [7] Peptic ulcers occur due to mucosal damage and subsequent ulceration due to increased aggressive factors, decreased protective factors, or both. [8,9] The estimated prevalence of peptic ulcer disease in the

western population ranges from 5 to 15%, with a lifetime incidence of almost 10%. [8] With the introduction of H2 receptor antagonists and proton pump inhibitors, the incidence of elective surgery for peptic ulcer (PU) disease has decreased dramatically, although complications of peptic ulcer disease such as perforation and bleeding have remained fairly constant. [10]

Therefore, early identification of perforated peptic ulcer patients with a high risk of adverse outcomes following surgery is important for clinical decision-making. This can assist in risk stratification and triage, e.g. timing and extent of pre-operative respiratory and circulatory stabilization, post-operative admission to a high dependency unit (HDU), the level and extent of monitoring, and inclusion in specific perioperative care protocols. [11,12] Duodenal, antral and gastric body ulcers account for 60%, 20% and 20% ulcers among the peptic ulcer perforations respectively. [13] Mortality and morbidity following perforated peptic ulcer (PPU) are substantial, and mortality rates of up to 25-30% have been reported in population-based studies. [11] Some studies have shown that patient factors like shock on arrival, acute renal failure, low serum albumin, metabolic acidosis and preoperative delay > 24 hours are significantly associated with a higher rate of mortality. [14,15]

The aim of the present study was to evaluate the association between various preoperative factors with postoperative mortality and morbidity in patients operated for peptic ulcer perforation.

Materials and Methods

The present study was hospital based, retrospective study conducted in Department of General Surgery, Katihar Medical College and Hospital, Katihar, Bihar, India for two years .100 case records were studied.

Case records of patients of either gender, age > 18 years, admitted, diagnosed with duodenal ulcer perforation and surgically treated at our hospital from last 4 years were evaluated. Intraoperative patients diagnosed as gastric ulcer perforation were excluded. Patient details (age, sex, occupation, clinical presentation, duration of symptoms), clinical findings, paracentesis (if done), radiological investigations (plain X- ray of erect abdomen, ultrasonography, CT scan), laboratory investigations (CBC, LFT, RFT, urine microscopy, ABG, etc.) were noted in study proforma. Intraoperative details (site and size of perforation, amount of peritoneal contamination, complications) were noted. All cases were managed surgically by Graham's omentoplasty. Treatment, clinical course and postoperative complications were duly noted. Follow-up details till 6 months, if any upper GI endoscopy was done to rule out chronic duodenal ulcer were noted.

Data was collected and analysed using Microsoft Excel. Statistical analysis was done using descriptive statistics. Difference of proportions between qualitative variables was tested using chi-square test or Fisher exact test as applicable. P value less than 0.5 was considered as statistically significant.

Results

Table 1: Age wise distribution

Age in years	Male	Female	Total
19-30	2	0	2 (2 %)
31-40	5	0	5 (5)
41-50	23	2	25 (25%)
51-60	32	6	38 (38%)
61-70	18	2	20 (20%)
≥ 71	10	0	10 (10%)
Total	90 (90%)	10 (10%)	100 (100)

Majority was male (90%), most common age group was 51-60 years (38%) followed by 41-50 years (25%).

Table 2: Signs and symptoms on admission

Signs and symptoms	N	%
Tachycardia	96	96
Abdominal rigidity	92	92
Abdominal tenderness	90	90
Absence of bowel sound	80	80
Dehydration	64	64
Abdominal distention	58	58
Anemia	32	32
Fever	23	23
Manifestations of shock	16	16

Common clinical features at the time of admission were tachycardia (96%), abdominal rigidity (92%), abdominal tenderness (90%), absence of bowel sound (780%), dehydration (64%), abdominal distention (58%), anemia (32.58 %), fever (23%), manifestations of shock (16%).

Table 3: General characteristics

Characteristics	No. of Patients	Percentage (%)
Duration from onset of symptoms to admission (in hours)		
0-6	17	17
6-12	32	32
12-24	33	33
>24	18	18
Associated risk factors		
Smoking	54	54
Alcoholism	51	51
Previous history of PUD	18	18
Diabetes mellitus	16	16
Use of NSAIDs	15	15
Stress	12	12
Fasting	10	10
Steroids	7	7
Family history	7	7
Perforation diameter in mm		
1–5	64	64
6–10	20	20
11–15	8	8
16–20	6	6
>20mm	2	2
Peritoneal contamination		
< 1 litre	78	78
1–2 litre	14	14
> 2 litre	8	8
Postoperative complications		
Respiratory complication	26	26
Paralytic ileus	20	20
Septicaemia	16	16
Wound infections	15	15
Burst abdomen	5	5
Urinary tract infection	4	4
Renal failure	3	3
Intestinal obstruction	1	1
Mortality in 6 months	15	15

Duration from onset of symptoms to admission was 12-24 hours (33%) in majority of patients. Associated risk factors noted were smoking (54%), alcoholism (51%), previous history of PUD (18%), diabetes mellitus (16%), use of NSAIDs (15%) and stress (12%). Intra-operatively, perforation diameter was 1–5 mm in majority of cases (64%) followed by 6–10 mm (20%). Peritoneal contamination was < 1 litre in majority of cases (78%). Major postoperative complications in present study were respiratory complication (26%), paralytic ileus (20%), septicaemia (16%), wound infections (15%), burst abdomen (5%). Mortality in 6 months was noted in 15 cases (15%).

Table 4: Factors related to mortality

Factors	Survived (n=85)	Died (n=15)	p value
Male gender	80	15	0.48
Age > 60 years	16	12	<0.001
Septicemic shock on admission	3	10	<0.001
Size of perforation > 1 cm	4	9	<0.001
Delayed presentation > 24 hours	10	8	<0.001
Smoking	42	8	<0.001
Diabetes mellitus	5	7	<0.001
Peritoneal contamination > 2 litre	2	5	<0.001

In present study factors significantly associated with mortality were age > 60 years, septicemic shock on admission, size of perforation > 1 cm, delayed presentation > 24 hours, smoking, diabetes mellites and peritoneal contamination > 2 litre.

Discussion

Peritonitis due to peptic ulcer perforation constitutes one of the most common surgical emergencies worldwide and is associated with a high rate of morbidity and mortality. [16] Perforation was the cause of death in 70% of the patients with peptic ulcer and rate of mortality due to PPU is 10- fold higher than other acute abdominal factors such as acute appendicitis and acute cholecystitis. [17] The incidence of duodenal perforation is 7–10 cases/100,000 adults per year. 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%). [18]

Majority was male (90%), most common age group was 51-60 years (38%) followed by 41-50 years (25%). In a study by Kishore Babu [19] most common age group was 60–70 years and male to female ratio was 7:1. Common clinical features at the time of admission were tachycardia (96%), abdominal rigidity (92%), abdominal tenderness (90%), absence of bowel sound (780%), dehydration (64%), abdominal distention (58%), anemia (32.58 %), fever (23%), manifestations of shock (16%). Early presentation, prompt diagnosis, adequate resuscitation, emergency surgery and postoperative monitoring are useful for successful management and good outcome of perforated peptic ulcer. Similar findings were noted in present study Laishram OS [20] studied 110 patients, 96.3% were males and 41-50 years was the most common age group.

In study by Kassim Trayem [21], of the 100 cases, 96% were males and 4% were females with mean age of 43.13 years. The disease was more common in rural areas (58%), 55 % of patients had previous history of duodenal ulcer and 45% had no previous history of duodenal ulcer. The most common risk factors are smoking (32%) and NSIADs (25%). Most patients admitted to hospital between 19–24 hours (21%), (8%) admitted during 6 hours and (2%) admitted after 120 hours. Duration from onset of symptoms to admission was 12-24 hours (33%) in majority of patients. Associated risk factors noted were smoking (54%), alcoholism (51%), previous history of PUD (18%), diabetes mellitus (16%), use of NSAIDs (15%) and stress (12%). Intra-operatively, perforation diameter was 1–5 mm in majority of cases (64%) followed by 6–10 mm (20%). Peritoneal contamination was < 1 litre in majority of cases (78%). Major postoperative complications in present study were respiratory complication (26%), paralytic ileus (20%), septicaemia (16%), wound infections (15%), burst abdomen (5%). Mortality in 6 months was noted in 15 cases (15%). In present study factors significantly associated with mortality were age > 60 years, septicemic shock on admission, size of perforation > 1 cm, delayed presentation > 24 hours, smoking, diabetes mellites and peritoneal contamination > 2 litre.

The clinical presentation of gastroduodenal perforation is usually sudden onset of abdominal pain. Localized or generalized peritonitis is typical of perforated peptic ulcer, but may be present in only two-thirds of the patients. [22] G Bas et al [23] stated in their study that recognition of symptoms was significantly later in elderly patients thereby therapeutic delay increasing the mortality rate from 0–20%. Similar findings were noted in present study. The diagnosis is made clinically and confirmed by presence of gas under diaphragm on radiograph, but absence does not exclude the presence of perforation. When chest x-ray does not show pneumoperitoneum, or a relatively well-patient with a sealed perforation and uncertain diagnosis, a contrast enhanced computed tomography scan (CECT) of the abdomen is useful as it has a high diagnostic accuracy of 98%. [24]

Conclusion

In present study factors significantly associated with mortality in patients with peritonitis due to duodenal ulcer perforation were age > 60 years, septicemic shock on admission, size of perforation > 1 cm, delayed presentation > 24 hours, smoking, diabetes mellites and peritoneal contamination > 2 litre.

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