

FACTORS AFFECTING MORTALITY AND MORBIDITY OF PEPTIC ULCER PERFORATIONSudhir Suresh Bhat¹, Avinash Patil²¹General Surgeon, Department of General Surgery, J. J. M. Medical College, Davangere.²General Surgeon, Department of General Surgery, J. J. M. Medical College, Davangere.**ABSTRACT****BACKGROUND**

Objectives- Peptic Ulcer Disease (PUD) refers to the underlying tendency to develop mucosal ulcers at sites that are exposed to peptic juice (acid and pepsin). Among abdominal emergencies, perforations of peptic ulcer are third in frequencies; acute appendicitis and acute intestinal obstruction being more common. Prompt recognition of the condition is very important and only by early diagnosis and treatment it is possible to reduce the mortality.

This study was mainly conducted to assess the risk factors affecting mortality and morbidity in peptic ulcer perforation.

MATERIALS AND METHODS

This is a case series study of 60 cases operated for peptic ulcer perforation admitted to Chigateri General Hospital and Bapuji Hospital, attached to J. J. M. Medical College, Davangere from June 2009 to May 2011. A detailed history of suspected patients of peptic ulcer perforation regarding age, sex, previous use of NSAIDs, smoking and other associated illnesses was taken. Post-operative complications were assessed. The results were discussed and analysed for significance with available published literature.

RESULTS

Peptic ulcer perforation was common in the age group of 30 - 50 years with mean age of 44 years. Elderly patients (≥ 65 years) had increased morbidity (p-value 0.02) and mortality (p-value < 0.001). Peptic ulcer perforation was common in males than females in ratio of 9:1. Regular ingestion of NSAIDs and/or steroids was not an important risk factor in causation of peptic ulcer perforation. Smoking (58.3%) and alcohol beverage consumption (53.3%) were commonly seen in patients with peptic ulcer perforation.

CONCLUSION

Perforated peptic ulcer disease is emerging as a frequent cause of acute abdomen in South India. The perforation is common between age group of 30 - 50 years. It is more common in males. The duration of perforation more than 24 hours and presence of shock on admission is associated with increased morbidity and mortality in patients with peptic ulcer perforation. Early diagnosis and prompt management of shock and septicaemia is important for better prognosis of patients.

KEYWORDS

Peptic Ulcer Disease.

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BACKGROUND

The term peptic ulcer disease is used broadly to include ulcerations and erosions in the stomach and duodenum due to number of causes.

Peptic Ulcer Disease (PUD) refers to the underlying tendency to develop mucosal ulcers at sites that are exposed to peptic juice (acid and pepsin). Most commonly, ulcers occur in the duodenum and stomach, but they may also occur in the oesophagus, in the small intestine, at gastroenteric anastomoses and rarely in areas of ectopic gastric mucosa, for example in Meckel's diverticula.¹

This illness affects nearly 10% of people in our country. It is commonly found in young people at the prime of their age and has been said to be associated with "hurry, worry and curry." The factors responsible for causing ulcers include-

- Cigarette smoking.
- Use of painkiller drugs.
- Physical and mental stress.
- A diet rich in chillies, coffee, colas and rice.

However, recent research has shown that the most important factor is the presence of a spiral shaped bacteria in the stomach called *Helicobacter pylori*. This bacterium enters the stomach by the oral route and is usually acquired at a young age. The organism may be present in about 40% of healthy people, but transformation into disease like peptic ulcer and stomach cancer occurs only in few.

The complications of peptic ulcer include haemorrhage, perforation and pyloric stenosis. Perforation of duodenal peptic ulcer is a common surgical emergency.

There is decline in incidence of peptic ulcers and elective surgery for peptic ulcers, which is attributed to the era of H₂ blockers and proton pump inhibitors, which provides symptomatic relief to patient. But the percentage of patients with perforation has not declined, probably due to increased inadvertent use of NSAIDs, corticosteroids and because of irregular use of H₂ antagonist drugs.

Among abdominal emergencies, perforations of peptic ulcer are third in frequencies, acute appendicitis and acute intestinal obstruction being more common. Prompt

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recognition of the condition is very important and only by early diagnosis and treatment it is possible to reduce the mortality.

The treatment of perforation still continues to be controversial. Just closure of perforation may save life, but chance of recurrence of ulcer is too high and patient may not turn up for a second curative surgery.

When acute or chronic duodenal ulcer perforates into the peritoneal cavity three components require treatment, viz. the ulcer, the perforation and the resultant peritonitis. The perforation and resultant peritonitis are immediate threats to the life; the ulcer in itself is not. The therapeutic priorities thus are treatment of peritonitis and securing the closure of perforation, which may be achieved with surgical procedure.²

In spite of better understanding of disease, effective resuscitation and prompt surgery under modern anaesthesia techniques, there is high morbidity (36%) and mortality (6%). Hence, an attempt has been made to analyse the various factors, which are affecting the morbidity/mortality of patients with peptic ulcer perforations.

MATERIALS AND METHODS

This is a case series study of 60 cases operated for peptic ulcer perforation admitted to Chigateri General Hospital and Bapuji Hospital, attached to J. J. M. Medical College, Davangere from June 2009 to May 2011.

This study was mainly conducted to assess the risk factors affecting mortality and morbidity in peptic ulcer perforation.

Inclusion Criteria

1. Patients with peptic ulcer perforation of age > 14 years.
2. Patients with duodenal or gastric perforation of peptic ulcer origin.
3. Patients who will undergo simple closure with omental patch as a standard operative procedure.

Exclusion Criteria

1. Patients with perforation of peptic ulcer origin at jejunum, ileum adjacent to Meckel's diverticulum.
2. Patients treated with conservative management.

A detailed history of suspected patients of peptic ulcer perforation regarding age, sex, previous use of NSAIDs, smoking and other associated illnesses was taken. The diagnosis was made on clinical findings supported by investigations like plain x-ray erect abdomen. Relevant investigations were performed on the patient. Preoperatively, ASA grading of patients and time frame to surgery were assessed.

Immediate resuscitation was done with nasogastric suction, intravenous fluids, antibiotics and urine output monitoring. All patients of peptic ulcer perforation were operated as simple closure with omental patch. Gastric biopsy was done to rule out perforations due to malignancy of stomach.

Patients were followed up every day with continuous bedside monitoring of vital data in the immediate post-operative period. Due attention was paid to note the development of any complication. Suitable and appropriate treatment was instituted from time to time according to the needs of the patients.

Postoperative complications like wound infection, wound dehiscence, leak from closed perforation site, fistula, peritonitis, intra-abdominal abscess, septicaemia, respiratory infections and renal failure were assessed.

After satisfactory improvement, patients were discharged from the hospital with advice regarding diet, anti-ulcer drugs and quitting of smoking/alcohol, etc. All the patients were instructed to come for regular followup.

A detailed structured proforma was used to collect this information.

The results were discussed and compared with available published literature in the form of tables and charts. Significance is assessed at 5% level of significance. Spearman correlation and chi square were used as statistical methods.

RESULTS

The peptic ulcer perforation is one of the most common surgical emergencies, third only to acute appendicitis and road traffic accidents. From June 2009 to May 2011, a total of 60 patients with peptic ulcer perforations were studied.

Age and Sex

Age (Years)	Males		Females		Total	
	No.	%	No.	%	No.	%
15 - 19	1	1.9	0	0.0	1	1.7
20 - 29	10	18.5	0	0.0	10	16.7
30 - 39	11	20.4	2	33.3	13	21.7
40 - 49	10	18.5	2	33.3	12	20.0
50 - 59	9	16.7	2	33.3	11	18.3
60 - 69	9	16.7	0	0.0	9	15.0
70 - 79	2	3.7	0	0.0	2	3.3
80 - 89	2	3.7	0	0.0	2	3.3
Total	54	100.0	6	100.0	60	100.0
Mean +/- SD	44.7 +/- 16.5		42.3 +/- 8.4		44.4 +/- 15.9	

Table 1. The Age and Sex Incidence in Patients with Peptic Ulcer Perforation

The highest incidence was observed in fourth decade of life. The youngest patient was 19 years old and oldest was 85 years old.

Perforation was more common in males compared to females, the ratio being 9:1. Out of 60 cases, 54 were males.

The mean age (SD) of the patients was 44.4 (15.9) years. The mean ages (SD) were for males 44.7 (16.5) years and for females 42.3 (8.4) years.

Postoperative Complications

Complications	No.
Wound Infection	23
Renal Failure	5
Respiratory Failure	4
Septicaemia	3
Leak	2
Intra-abdominal Abscess	1

Table 2. Postoperative Complications in Patients with PUP

29 (48.3%) patients had postoperative complications. Most common postoperative complication was wound infection in about 23 patients followed by renal failure in 5

patients, which was managed conservatively. Respiratory failure in 4 patients and septicaemia in 3 patients.

4 patients with respiratory failure required ventilator support in postoperative period; 3 patients improved with ventilator support and 1 patient expired due to associated septicaemia.

2 patients had bilious leak through drain in postoperative period. Patients were reexplored and leak was identified from previously closed perforation site. Both patients underwent simple omental patch closure of the perforation.

One patient had residual intra-abdominal abscess, which was managed by ultrasound-guided aspiration.

Parameter	No.	Morbidity	%	P-Value	Mortality	%	P-Value
Sex	Males	54	25	0.6	3	5.6	0.72
	Females	6	4		0	0.0	
Age	< 65 yrs.	52	22	0.02	1	1.9	0.001
	≥ 65 yrs.	8	7		2	25.0	
Drug (NSAID + Steroid)	Present	4	1	0.19	0	0.0	0.77
	Absent	56	28		3	5.4	
H/O Smoking	Present	35	20	0.1	2	5.7	0.7
	Absent	25	9		1	4.0	
H/O Alcohol	Present	32	16	0.78	1	3.1	0.41
	Absent	28	13		2	7.1	
Associated Illness	Present	5	4	0.14	1	20.0	0.23
	Absent	55	25		2	3.6	
Time of Surgery	≤ 24 hrs.	22	1	< 0.001	0	0.0	0.24
	> 24 hrs.	38	28		3	7.9	
Shock	Present	26	20	< 0.001	2	7.7	0.39
	Absent	34	9		1	2.9	
H/O PUD	Present	7	3	0.75	0	0.0	0.68
	Absent	53	26		3	5.7	
ASA Grade	I	0	0	<0.001	0	0.0	-
	II	41	13		0	0.0	
	III	16	13		0	0.0	-
	IV	3	3		3	100.0	
Hb	< 11	10	4	0.56	0	0.0	-
	> 11	50	25		3	6.0	
Peritoneal Collection	Bilious	33	6	< 0.001	0	0.0	-
	Purulent	27	23		3	11.1	
Site	Duodenal	45	20	0.29	3	6.7	-
	Gastric	15	9		0	0.0	

Table 3. Factors affecting Morbidity and Mortality in Patients with PUP

In the analysis of 60 patients, only factor, viz. age of 65 years and more (p-value < 0.001) was a statistically significant predictor of mortality.

Parameter		Total No.	Wound Infection		Renal Failure		Respiratory Failure		Septicaemia		Leak		Intra-abdominal abscess		Death	
			No	%	No	%	No	%	No	%	No	%	No	%	No	%
Age	< 65	52	17	32.7	3	5.8	2	3.8	1	1.9	2	3.8	1	1.9	1	1.9
	≥ 65	8	6	75.0	2	25.0	2	25.0	2	25.0	0	0.0	0	0.0	2	25.0
Time	≤ 24 hrs.	22	1	4.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	> 24 hrs.	38	22	57.9	5	13.2	4	10.5	3	7.9	2	5.3	1	2.6	3	7.9
Shock	Present	26	16	61.5	5	19.2	2	7.7	2	7.7	2	7.7	0	0.0	2	7.7
	Absent	34	7	20.6	0	0.0	2	5.9	1	2.9	0	0.0	1	2.9	1	2.9
ASA Grade	II	41	10	24.4	0	0.0	2	4.9	0	0.0	0	0.0	1	2.4	0	0.0
	III	16	10	62.5	3	18.8	1	6.3	0	0.0	2	12.5	0	0.0	0	0.0
	IV	3	3	100.0	2	66.7	1	33.3	3	100.0	0	0.0	0	0.0	3	100.0
Peritoneal Collection	Bilious	33	6	18.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Purulent	27	17	63.0	5	18.5	4	14.8	3	11.1	2	7.4	1	3.7	3	11.1

Table 4. Main Risk Factors and Postoperative Complications seen in Our Study

DISCUSSION

Peptic ulcer perforation is one of the commonest surgical emergencies. Although, incidence of surgery for peptic ulcer

diseases has reduced drastically with advent of H₂ receptor antagonist and proton pump inhibitors, but surgery for perforation has not changed.

Age Incidence

Study	Mean Age
Boey et al (1987) ³	51
Irvin (1989) ⁴	70
Wakayama et al (1994) ⁵	52
Noguiera et al (2003) ⁶	53
Testini et al (2003) ⁷	52
Sharma et al (2006) ⁸	33
Kocer et al (2007) ⁹	43
J. C. Dakubo et al (2009) ¹⁰	41
Present Study	44

Table 5. Mean Age of Patients with PUP in Various Studies

Sex Incidence

Study	Male : Female Ratio
R. B. Satwakar et al (1978)	9:1
J. Boey et al (1982) ³	6.6 : 1
Noguiera et al (2003) ⁶	2.5:1
Testini et al (2003) ⁷	2.9:1
Sharma et al (2006) ⁸	18.2:1
Kocer et al (2007) ⁹	8:1
J. C. Dakubo et al (2009) ¹⁰	4.5:1
Present Study	9:1

Table 6. Sex Incidence in Patients with PUP in Various Studies

Parameter		Kocer et al (2007)		J. C. Dakubo et al (2009)		Present Series	
		No.	%	No.	%	No.	%
Drug (NSAID + Steroid)	Present	24	8.9	92	36.2	4	6.7
	Absent	245	91.1	162	63.8	56	93.3
H/O Smoking	Present	197	73.2	32	12.6	35	58.3
	Absent	72	26.8	222	87.4	25	41.7
H/O Alcohol	Present	33	12.3	124	48.8	32	53.3
	Absent	236	87.7	130	51.2	28	46.7

Table 7. History of use of NSAIDs, Smoking and Alcohol Consumption in Patients with PUP in Various Studies

Study	Parameter		Age of Patients		Time of Sx		Shock	
			< 65 Yrs.	≥ 65 Yrs.	< 24 Hrs.	> 24 Hrs.	Present	Absent
Kocer et al (2007) ⁹	No. of Patients		216	53	189	80	16	253
	Morbidity	No.	35	30	30	35	15	50
		%	16.2	56.6	15.9	43.8	93.8	19.8
	Mortality	No.	3	20	7	16	11	12
%		1.4	37.7	3.9	20.0	68.8	4.7	
J. C. Dakubo et al (2009) ¹⁰	No. of Patients		220	34	118	136	34	220
	Morbidity	No.	55	7	17	45	13	39
		%	25.0	20.6	14.4	33.1	38.2	17.7
	Mortality	No.	15	9	8	16	7	14
%		6.8	26.5	6.8	11.8	20.6	6.4	
Present Study	No. of Patients		52	8	22	38	26	34
	Morbidity	No.	22	7	1	28	20	9
		%	42.3	87.5	4.5	73.7	76.9	26.5
	Mortality	No.	1	2	0	3	2	1
%		1.9	25.0	0	7.9	7.7	2.9	

Table 8. Morbidity and Mortality in Different Age Groups, Time of Surgery and Shock

CONCLUSION

Perforated peptic ulcer disease is emerging as a frequent cause of acute abdomen in South India. The perforation is common between age group of 30 - 50 years. It is more common in males.

The duration of perforation more than 24 hours and presence of shock on admission is associated with increased morbidity and mortality in patients with peptic ulcer perforation.

Early diagnosis and prompt management of shock and septicaemia is important for better prognosis of patients.

Patients with purulent peritoneal collection have increased morbidity and mortality.

Morbidity rate in our study is 48.3% and mortality rate is 5%.

Age more than 65 years, duration of perforation of more than 24 hours before surgery, presence of shock on admission, ASA grade and purulent peritoneal collection are factors significantly associated with fatal outcomes in patients undergoing emergency surgery for perforated peptic ulcer. Therefore, proper resuscitation from shock, improving ASA grade and decreasing delay in surgery is needed to improve overall results.

Summary

In this study, 60 cases of peptic ulcer perforation were studied during the period from June 2009 to May 2011 at Chigateri General Hospital and Bapuji Hospital, attached to J. J. M.

Medical College, Davangere, admitted in all units of General Surgery.

Peptic ulcer perforation was common in the age group of 30 - 50 years with mean age of 44 years. Elderly patients (≥ 65 years) had increased morbidity (p-value 0.02) and mortality (p-value < 0.001).

Peptic ulcer perforation was common in males than females in ratio of 9:1.

Smoking (58.3%) and alcohol beverage consumption (53.3%) were commonly seen in patients with peptic ulcer perforation. But these factors were less significant in postoperative morbidity and mortality.

Regular ingestion of NSAIDs and/or steroids was not an important risk factor in causation of peptic ulcer perforation. It was also not a significant risk factor in postoperative mortality and morbidity (p-value 0.19).

Previous history of peptic ulcer disease was not an important risk factor in causation peptic ulcer perforation, as sizeable number of patients did not give positive history of dyspepsia or peptic ulcer symptoms. It was also not a significant risk factor in postoperative mortality and morbidity (p-value 0.75).

8.3% patients had associated co-morbid conditions. But these conditions did not significantly affect postoperative mortality and morbidity.

Presence of gas under the diaphragm in plain x-ray erect abdomen confirms the diagnosis, but their absence does not exclude the diagnosis. In our study, all patients had gas under the diaphragm.

Shock on admission was a strong determinant of morbidity and mortality in peptic ulcer perforation. In this study, shock on admission was a significant risk factor (p-value < 0.001) for morbidity in peptic ulcer perforation. Shock is a correctable variable that must be treated before surgery to minimise morbidity and mortality rate.

73.7% patients who underwent surgery 24 hours after the onset of symptoms developed postoperative complications, i.e. 15 times more compared to patients who underwent surgery before 24 hours. So delayed surgery (> 24 hours) is associated with increased morbidity and mortality in postoperative period.

ASA score serves as a valuable predictor of mortality and morbidity in the management of perforated peptic ulcer. Each increase in ASA status caused an increase in the morbidity risk by 2 times. In our study, mortality was 100% in patients with ASA grade IV.

Resuscitation and preoperative management of the patient were as important as the surgical procedure. The surgical

management of peptic ulcer perforation was mainly by simple closure of perforation with omental patch.

Purulent peritoneal collection was a significant risk factor (p-value, < 0.001) for morbidity in PUP. All 3 expired patients had purulent peritoneal collection.

Postoperative morbidity was seen in 48.3% of patients and mortality in 5%. Most common postoperative complication was wound infection (59%) followed by renal failure (13%) and septicemia (8%).

Risk factors for morbidity and mortality in perforated peptic ulcer were aged 65 years and more, duration of perforation more than 24 hours before surgery, presence of shock on admission, higher ASA grade and purulent peritoneal collection.

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