

# Clinical Analysis of Lethality in Perforated Peptic Ulcer

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## Abstract

**Background:** Worldwide, variations in demography, socio-economic status, *Helicobacter pylori* prevalence, prescription of drugs, and different food habits make difficult to identify the definitive factors causing lethality for this condition. The objective of this study was to find the cause and contributing risk factors in rural India, which affect prognosis in terms of morbidity and mortality of patients.

**Methods:** It is an analytical prospective study of 60 cases of perforated peptic ulcers with peritonitis, which are seen and treated over a period of 3-year.

**Results:** The results show older patients above 65 are with more morbidity (87.5% vs. 42.3%) and more mortality (25% vs. 1.9%). Morbidity is more in females (66.7% vs. 46.3%) and mortality is more in males (5.6% vs. 0.0%). Shock on admission has mortality (7.7%) and morbidity (76.9%). Timing of surgery after 24 h is associated with high morbidity (73.7%) and mortality (7.9%). Purulent peritoneal collection has got mortality (11.1%) and morbidity (85.2%), duodenal site perforation mortality (6.7%) and morbidity (44.4%). 4 non-steroidal anti-inflammatory drug patients (6.7%) with more morbidity (50% vs. 25%) and more mortality (5.4% vs. 0.0%). Smoking patients 35 (58.3%) with more morbidity (57.4% vs. 36%) and more mortality (5.7% vs. 5.4%). Alcoholics patients 32 (53.3%) with more morbidity (50% vs. 46.4%) and less mortality (5.7% vs. 4%). Comorbid conditions are with more morbidity (80.0% vs. 45.5%) and more mortality (20.0% vs. 3.6%).

**Conclusions:** In our study, age 65 years and more, presence of shock on admission, higher anesthesiologists grade, duration of perforation of more than 24 h before surgery and purulent peritoneal collection were statistically significant predictors of morbidity and/or mortality.

**Key words:** After 24 h, Co-morbid condition, Perforated peritonitis, Prognostic factor, Shock

## INTRODUCTION

Perforated peptic ulcer is the most common cause among all causes of gastrointestinal (GI) tract perforations which is an emergency condition of the abdomen that requires early recognition and timely surgical management.<sup>1</sup> It allows entry of gastric and duodenal contents into the peritoneal cavity resulting in initial

chemical peritonitis and further bacterial contamination which lead to suppurative peritonitis. There is a changing trend in the occurrence of complications in peptic ulcer disease from morbid gastric outlet obstruction to lethal perforation of peptic ulcer which is a major life-threatening complication. The mainstay of management of perforated peptic ulcer peritonitis is surgery. Endoscopic, laparoscopic, and laparoscopic-assisted procedures are now increasingly being performed instead of conventional laparotomy and simple closure of perforation with the omental patch.<sup>2,3</sup> In spite of advanced surgical techniques, antimicrobial therapy, and intensive surgical care, the management of peritonitis has high lethality in terms of morbidity and mortality. The spectrum of this disease in India is different from that of the western world.<sup>4</sup> Hence, the study was undertaken

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to evaluate the causes and contributing risk factors which influence the outcome of the patient.

**METHODS**

This is an analytical prospective study of 60 cases operated for perforated peptic ulcer peritonitis admitted to Mahatma Gandhi Memorial Hospital, Kakatiya Medical College, Warangal, Telangana State, located in South India. This study was mainly conducted to evaluate the cause and contributing risk factors, which affect prognosis in terms of mortality and morbidity of the patient.

**Inclusion Criteria**

Patients with peptic ulcer perforation of age >14 years, who will undergo simple closure with the omental patch as a standard operative procedure.

**Exclusion Criteria**

Pediatric patients of age <14 years presenting as peptic ulcer perforation, patients presenting as recurrent perforation or stomal ulcer perforation, who will undergo other than simple closure of perforation.

**Study Design and Methods**

This study was an analytical prospective study of 60 patients of perforated peptic ulcer peritonitis who were admitted in surgery department over a period of 3-year from March 2014 to April 2016 after institutional ethical committee approval and patient consent. All patients were interviewed, examined, findings were documented under following headings: (a) Demographical data (age, gender), (b) clinical features (duration of disease, before 24 h or after 24 h shock with grade at time of admission, (c) history of (dyspepsia, alcoholism, smoking, non-steroidal anti-inflammatory drugs [NSAIDs] usage), (d) associated comorbid conditions (hypertension and diabetes), and (e) operative findings (gastric, duodenal, bilious, and purulent).

All the diagnosed peptic ulcer perforations were operated as simple closure with omental patch. Patients were followed up every day with continuous bedside monitoring of vital data in the immediate post-operative period. After satisfactory improvement, patients were discharged from the hospital with advice regarding diet, antiulcer drugs and quitting of smoking/alcohol, etc., All the patients were instructed to come for regular follow-up. The results were analyzed and compared with available published literature in the form of tables and charts.

**RESULTS**

The results show older patients above 65 are with more morbidity (87.5% vs. 42.3%) and more mortality (25% vs. 1.9%). Morbidity is more in females (66.7% vs. 46.3%) with  $P = 0.6$  and mortality is more in males (5.6% vs. 0.0%) with  $P = 0.72$ . Shock on admission has mortality (7.7%) and morbidity (76.9%). Timing of surgery after 24 h is associated with high morbidity (73.7%) and mortality (7.9%). Purulent peritoneal collection has got mortality (11.1%), morbidity (85.2%), duodenal site perforation mortality (6.7%), and morbidity (44.4%). Associated risk factors are NSAID usage in 4 patients (6.7%) with more morbidity (50% vs. 25%) with  $P = 0.19$  more mortality (5.4% vs. 0.0%) with  $P = 0.77$ . Smoking in 35 patients (58.3%) more morbidity (57.4% vs. 36%) with  $P = 0.1$ , more mortality (5.7% vs. 5.4%) with

**Table 1: Various factors affecting morbidity in patients with PUP**

Parameter	N	Morbidity	Percentage	P
Sex				
Males	54	25	46.3	0.6
Females	6	4	66.7	
Age (years)				
<65	52	22	42.3	0.02
≥65	8	7	87.5	
Drug (NSAID+steroid)				
Present	4	1	25.0	0.19
Absent	56	28	50.0	
H/O smoking				
Present	35	20	57.1	0.1
Absent	25	9	36.0	
H/O alcohol				
Present	32	16	50.0	0.78
Absent	28	13	46.4	
Associated illness				
Present	5	4	80.0	0.14
Absent	55	25	45.5	
Time of surgery (hrs)				
≤24	22	1	4.5	<0.001
>24	38	28	73.7	
Shock				
Present	26	20	76.9	<0.001
Absent	34	9	26.5	
H/O PUD				
Present	7	3	42.9	0.75
Absent	53	26	49.1	
ASA Grade				
I	0	0	0.0	<0.001
II	41	13	31.7	
III	16	13	81.3	
IV	3	3	100.0	
Hb				
<11	10	4	40.0	0.56
>11	50	25	50.0	
Peritoneal collection				
Bilious	33	6	18.2	<0.001
Purulent	27	23	85.2	
Site				
Duodenal	45	20	44.4	0.29
Gastric	15	9	60.0	

$P = 0.77$ , alcohol in 32 patients (53.3%) more morbidity (50% vs. 46.4%) with  $P = 0.78$ , less mortality (5.7% vs. 4%) with  $P = 0.7$ , history of dyspepsia in 7 patients (11.7%) are with less morbidity (42.9% vs. 49.1%) with  $P = 0.75$ , less mortality (0.0% vs. 5.7%) with  $P = 0.68$ , associated comorbid conditions are with more morbidity (80.0% vs. 45.5%) with  $P = 0.14$  and with more mortality (20.0% vs. 3.6%) with  $P = 0.23$ . They are hypertension in 2 patients, diabetes in 1 patient, and congestive cardiac failure in 1 patient (Tables 1 and 2).

## DISCUSSION

This prospective analytical study shows lethality of the patient in the form of mortality and morbidity. The present

**Table 2: Various factors affecting mortality in patients with PUP**

Parameter	N	Morbidity	Percentage	P
Sex				
Males	54	3	5.6	0.6
Females	6	0	0.0	
Age (years)				
<65	52	1	1.9	0.001
≥65	8	2	25.0	
Drug (NSAID+steroid)				
Present	4	0	0.0	0.77
Absent	56	3	5.4	
H/O smoking				
Present	35	2	5.7	0.7
Absent	25	1	4.0	
H/O alcohol				
Present	32	1	3.1	0.41
Absent	28	2	7.1	
Associated illness				
Present	5	1	20.0	0.23
Absent	55	2	3.6	
Time of surgery (h)				
≤24	22	0	0.0	0.24
>24	38	3	7.9	
Shock				
Present	26	2	7.7	0.39
Absent	34	1	2.9	
H/O PUD				
Present	7	0	0.0	0.68
Absent	53	3	5.7	
ASA grade				
I	0	0	0.0	-
II	41	0	0.0	
III	16	0	0.0	
IV	3	3	100.0	
Hb				
<11	10	0	0.0	-
>11	50	3	6.0	
Peritoneal collection				
Bilious	33	0	0.0	-
Purulent	27	3	11.1	
Site				
Duodenal	45	3	6.7	-
Gastric	15	0	0.0	

ASA: Anesthesiologists

study was with 5% mortality and 48.3% morbidity. The various studies show 6-10% mortality.<sup>4</sup> The present study mortality is at the lower limit. In the study by Testini *et al.* (2003), male-female ratio was 2.9:1 and that in a study by Sharma *et al.* (2006)<sup>8</sup> was 18.2:1. The present study matches with Kocer *et al.* (2007) with ratio of 8:1. In our study, 90% were males and 10% were females, and the male-female ratio being 9:1. The identified prognostic factors are age of the patient, timing of surgery, shock on admission, purulent peritoneal collection (11.1%), and duodenal site perforation (6.7%). In a study by Kocer *et al.*, in 2007, patients older than 65 years had a higher morbidity rate (56.6% vs. 16.2%) and mortality rate (37.7% vs. 1.4%) when compared to younger patients. In a study by Dakubo *et al.*, in 2009, patients older than 60 years had a higher mortality rate (26.5% vs. 6.8%) when compared to younger patients, the compared results were represented in Table 3. In our study also, 25% mortality with significant  $P = 0.001$ . Timing of surgery after 24 h associated with high mortality (7.9%) which revealed in other studies (Dakubo 11.8%, Kocer 20%, and Testini 9.8%) has got higher mortality. Shock on admission has 7.7% mortality compared with other studies (Dakubo 20.6%, Kocer 68.8%, and Testini 55.5%) has got higher mortality which was compared in Table 4. In the study by Kocer *et al.*, in 2007, each increase in anesthesiologists (ASA) score increased morbidity 2 times and mortality 4.5 times in their patients.<sup>6</sup> The post-operative complication rate of the present study is 87.5% in above 65 age, 85% in purulent peritoneal fluid patients, and 76.9% in patients with shock. This signifies morbidity of the patient with comparing to other studies (Kocer 56.6%, Dakubo 20.6%) has got age-related morbidity. Alcohol intake,<sup>9</sup> smoking, NSAID usage, and history of dyspepsia have lethal effect on both mortality and morbidity of the patient. Associated comorbid condition has definitive lethal effect on the patient.

In our study, 45% patients had purulent peritoneal collection and 55% patients had bilious peritoneal collection. 85% of patients with purulent peritoneal collection developed

**Table 3: Morbidity and mortality in patients with PUP in different age groups**

Parameter	Morbidity and mortality	Age of patients	
		<65 years	≥65 years
Kocer <i>et al.</i> (2007)	Number of patients	216	53
	Mortality <i>n</i> (%)	35 (16.2)	30 (56.6)
	Mortality <i>n</i> (%)	3 (1.4)	20 (37.7)
Dakubo <i>et al.</i> (2009)*	Number of patients	220	34
	Mortality <i>n</i> (%)	55 (25.0)	7 (20.6)
	Mortality <i>n</i> (%)	15 (6.8)	9 (26.5)
Present study	Number of patients	52	8
	Mortality <i>n</i> (%)	22 (42.3)	7 (87.5)
	Mortality <i>n</i> (%)	1 (1.9)	2 (25.0)

\*Age >60 years

**Table 4: Mortality depending on time of surgery and shock on admission in patients with PUP**

Parameter	Time of surgery n (%)	Shock			
		≤24 hrs	>24 hrs	Present	Absent
Testini <i>et al.</i> <sup>5</sup>	Number of patients	41	108	9	140
	Mortality	5 (1.9)	11 (9.8)	5 (55.6)	1 (0.7)
Kocer <i>et al.</i> <sup>6</sup>	Number of patients	189	80	16	253
	Mortality	7 (3.7)	16 (20.0)	11 (68.8)	12 (4.7)
Dakubo <i>et al.</i> <sup>7</sup>	Number of patients	118 (8)	136 (16)	34 (7)	220
	Mortality	8 (6.8)	16 (11.8)	7 (20.6)	14 (6.4)
Present study	Number of patients	22	38	26	34
	Mortality	0 (0)	3 (7.9)	2 (7.7)	1 (2.9)

post-operative complications, i.e., 5 times more compared to patients with the bilious peritoneal collection. Wound infection was common post-operative complications in patients with the purulent peritoneal collection.

### CONCLUSION

In the analysis of 60 patients, age above 65 years, duration of perforation of more than 24 h before surgery, the presence of shock on admission with high ASA grade and purulent peritoneal collection were statistically significant predictors of mortality and morbidity. Each increase in ASA status caused an increase in the morbidity risk by 2 times. Shock on admission increased morbidity 3 times, delayed surgery (after 24 h) increased morbidity 15 times, and patients with purulent peritoneal collection had 5 times increased the risk. Duodenal perforation more lethal than gastric.

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