(International Print/Online Journal)

SJIF IMPACT FACTOR: 4.617
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume2, Issue 6, Page No: 200-207
November-December 2019

Factors Affecting Mortality and Morbidity in Peptic Ulcer Perforation

Mahapatra S K[1], Roul Saroj Kumar[2], Mahapatra Srimant[3]
[1.] Professor, [2.]Junior Resident, [3.]Data Scientist
Department of General Surgery,VIMSAR,Burla,Odisha,India.

***Corresponding Author:**

Roul Saroj Kumar
Junior Resident
Department of General Surgery,VIMSAR,Burla,Odisha,India

Type of Publication: Original Research Paper
Conflicts of Interest: Nil

ABSTRACT

AIMS: Study of risk factors like age, sex, use of NSAIDs, smoking and other associated illnesses in predicting morbidity and mortality in patients with perforated PU.Assessing the importance of time frame to surgery,ASA grading regarding outcome of surgery and postoperative complications in operated cases of peptic ulcer perforation like wound dehiscence,ARDS,renal failure,leak and chronic(persistent) peritoneal sepsis etc.

MATERIALS AND METHODOLOGY: 65 patients with peptic ulcer perforation who were fulfilling the inclusion and exclusion criteria were taken into the study done in Department of Genereal Surgery,VIMSAR,BURLA,ODISHA from November 2017 to October 2019.The following factors has been analysed in terms of morbidity and mortality: gender; age >60 years; associated medical illness; chronic ingestion of non-steroidal anti- inflammatory drugs, aspirin, corticosteroids or immunosuppressant; ; alcohol ingestion and smoking habits; American Society of Anesthesiologists (ASA) status ;delayed operation; site and size of perforation, shock on admission, type and amount of peritoneal fluid, serum albumin, whole blood transfusion and chronic (persistent) peritoneal sepsis..

RESULTS: Peptic ulcer perforation was common in the age group of 30-50 years with mean age 44 years in our study and the male-female ratio being 7.1:1. In our study, age 60 years and more (p-value 0.021), presence of shock on admission (p-value <0.001), higher ASA grade (p-value <0.001), duration of perforation of more than 24 hours before surgery (p-value <0.027) , amount of peritoneal collection(p value -0.029) , type of peritoneal collection-purulent collection (p-value <0.001) and serum albumin(p value -<0.01) were statistically significant predictors of morbidity and/or mortality.

CONCLUSION: Age more than 60 years, duration of perforation of more than 24 hours before surgery, presence of shock on admission, ASA grading of patients, amount and type of peritoneal collection. Serum albumin levels (<3.5g/dl) are factors significantly associated with fatal outcomes in patients. Therefore, proper resuscitation from shock improving ASA grade, decreasing delay in surgery, thorough peritoneal toileting and improving patient's nutritional status is needed to reduce overall mortality and mortality.

Keywords: Peptic ulcer perforation, risk factors, morbidity, mortality, chronic (persistent) peritoneal sepsis, ASA grading, peritoneal collection.

INTRODUCTION

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)1. Most commonly, ulcers occur in the duodenum and stomach. This illness affects nearly 10% of people in India. 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, diet rich in chilies, coffee, colas and rice. However recent research has shown that most important factor is the

presence of a spiral shaped bacteria called Helicobacter pylori.1

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 H2antagonist drugs. Prompt 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 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. Thus therapeutic priorities include treatment of peritonitis and securing the closure of perforation, which may be achieved with surgical procedure.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, attempt has been made to analyse the various factors15, which are affecting the morbidity/mortality of patients with peptic ulcer perforations.

AIMS AND OBJECTIVES

- The purpose of this study was to identify the risk factors like age, sex, use of NSAIDs, smoking and other associated illnesses that predict morbidity and mortality in patients with perforated PU.
- To assess importance of time frame to surgery and ASA13 grading regarding outcome of surgery.
- To assess postoperative complications in operated cases of peptic ulcer perforation like wound dehiscence, septicaemia, renal failure, leak, chronic (persistent) peritoneal sepsis etc.

MATERIALS AND METHODS

METHODOLOGY

PLACE OF STUDY

Department of General Surgery, VIMSAR ,Burla, Sambalpur,Odisha

DURATION OF STUDY

24Months (November 2017 To October 2019)

SAMPLE SIZE & STUDY POPULATION

For this study which is a hospital based prospective, observational study of a single center, a convenience sample of all maximum possible/potential subjects available at VIMSAR,Burla was taken as available during the study period. Total of 65 patients studied.

Inclusion criteria:

a. Patients with peptic ulcer perforation of age > 14 years.
b. Patients with duodenal or gastric perforation of peptic ulcer origin.
c. Patients who undergone simple closure with omental patch as a standard operative procedure.2

Exclusion criteria:

a) Patients with perforation of peptic ulcer origin at jejunum, ileum adjacent to Meckel‘s diverticulum.
b) Patients treated with conservative management and those patients treated with source control by only putting bilateral flank drains
c) Patients who had undergone vagotomy with gastrojejunostomy with simple closure or partial gastrectomy or pyloroplasty.
d) Paediatric patients of age < 14 years presented as peptic ulcer perforation.
e) Patients presented with recurrent perforation or stomal ulcer perforation.

METHODS OF STATISTICAL ANALYSIS:

Data entry was done by Microsoft Excel 2010 version, Data was presented in percentages and proportions and comparative figures (e.g. bar diagrams), to know the association of different factors in mortality and morbidity in peptic ulcer perforation and to compare the obtained data with that of standard literature.P value is calculated by using chi square test. Data is analysed by SPSS version 22 software.

Volume 2, Issue 6; November-December 2019; Page No.200-207

METHODS

Peptic ulcer perforation diagnosis was made on the basis of history, physical examination, routine laboratory studies and radiologic imaging. This study comprised of prospective analysis of all patients diagnosed with perforated peptic ulcer disease. Written informed consent has been taken from each patient who agrees to take part in the study. Patient evaluation done by history taking and clinical examinations. The following factors has been analyzed in terms of morbidity and mortality: age >60 years; gender; associated medical illness; chronic ingestion of non-steroidal anti- inflammatory drugs, aspirin, corticosteroids or immunosuppressant's; alcohol ingestion and smoking habits; American Society of Anesthesiologist (ASA)13 status; Hb% status,TLC,serum Albumin,delayed operation; site and size of ulcer perforation; and shock on admission and type of operation, type of peritoneal collection(bilious/purulent),amount of peritoneal collection and chronic (persistent) peritoneal sepsis16.Patient has kept for close observation and in case of any deterioration in the form of hypotension, fall in Hb, signs of peritonitis, increased requirement of blood transfusions, grade IV-V injury or associated coagulopathies, surgical intervention was taken. Hemodynamic instability at the time of presentation was defined as a systolic blood pressure less than 90 mmHg.A delay in treatment was defined as an interval of more than 24 hours until surgery from the suspected time of perforation.

METHODOLOGY

Immediate resuscitation was done with nasogastric suction, intravenous fluids, antibiotics, and urine output monitoring. All patients of peptic ulcer perforation were explorated, thorough peritoneal toileting, operated as simple closure with omental patch (Graham's patch) and bilateral ADK drains given in pelvis and Morison's pouch. 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. Suitable and appropriate treatment was instituted from time to time according to the needs of the patients. Patients with clinically moderate to severe pallor were treated with blood transfusion.

Postoperative complications10 like wound infection, wound dehiscence, leak from closed perforation site, fistula, peritonitis, intra-abdominal abscess, septicemia, respiratory infections, renal failure and chronic(persistent) peritoneal sepsis were assessed.

After satisfactory improvement, patients were discharged from the hospital with advice regarding diet, anti-ulcer drugs (H.Pylori kit/PPI) and quitting of smoking/alcohol etc. All the patients were instructed to come for regular follow-up.

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.

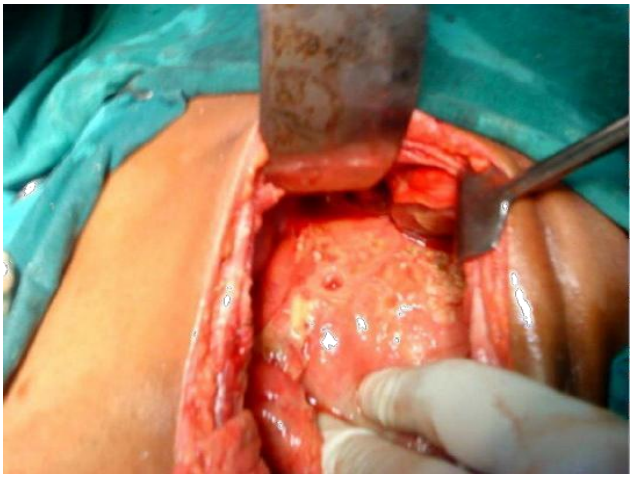

Figure 1: Perforated Gastric Ulcer

Volume 2, Issue 6; November-December 2019; Page No.200-207

Figure 2: Perforated Duodenal Ulcer

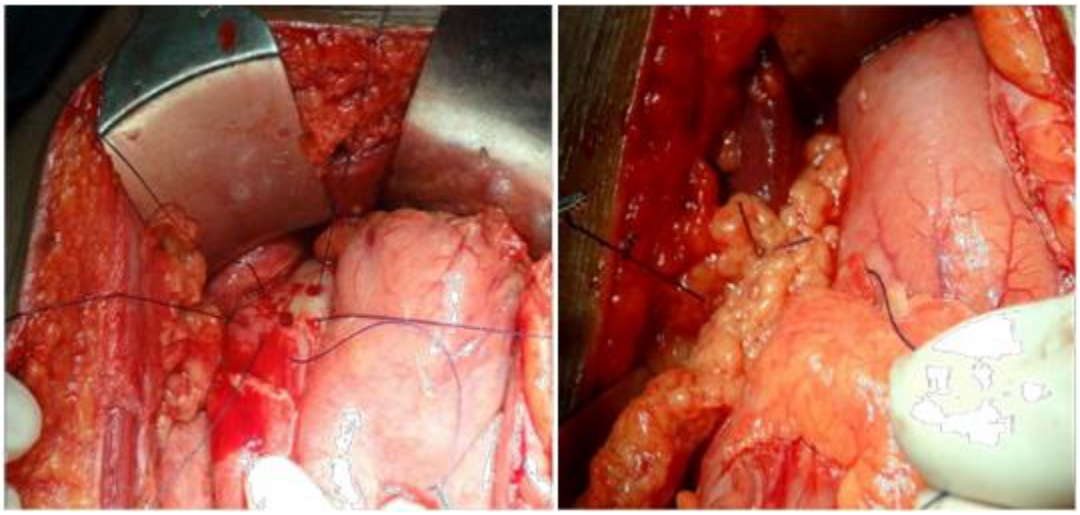

Figure 3: Simple Closure with omental patch

OBSERVATIONS AND RESULTS

From November 2017 to October 2019, a total of 65 patients with peptic ulcer perforations were studied in the Department of General Surgery, VIMSAR, Burla.

Table 1: Post operative complications in patients with PUP

Complications	No. of Patients
Wound Infection	*24*
Renal Failure	6
Respiratory failure	1
Septicemia	4
Leak	2
Chronic (persistent) peritoneal sepsis	7

Volume 2, Issue 6; November-December 2019; Page No.200-207

Table 2: Various factors affecting morbidity in patients with PUP

Parameter		N	Morbidity	%	p value
Sex	Male	57	21	36.8	0.075
	Female	8	1	12.5	
Age	<60 Years	51	16	31	0.562
	>60 Years	14	6	42	
Associated Illness	Present	5	3	60	0.041*
	Absent	60	19	31.6	
Smoking	Present	37	14	37.8	0.365
	Absent	28	8	28.5	
Alcohol	Present	33	13	39.4	0.711
	Absent	32	9	28.1	
Pepticulcer disease	Present	8	1	12.5	0.62
	Absent	57	21	36.8	
NSAID Usage	Present	5	1	20	0.219
	Absent	60	21	35	
Time of Surgery	<24 Hours	32	1	3.1	0.007*
	>24 Hours	33	21	63.6	
Shock	present	24	19	79.1	<0.001**
	Absent	41	3	7.3	
ASA Grade[13]	I	1	0	0	<0.001**
	II	26	12	46.1	
	III	32	8	25	
	IV	6	2	33.3	
Site	Duodenal	48	19	39.5	0.071
	Gastric	17	3	17.6	
Size of perforation	<1 cm	45	12	26.67	0.06
	>1 cm	20	10	50	
Peritoneal Collection	Bilious	37	5	13.5	<0.001**
	Purulent	28	17	60.7	
nount of peritoneal colle	<1 L	49	13	28.89	<0.029*
	>1 L	16	9	56.25	
Hemoglobin %	<11	10	3	30	0.8
	>11	55	19	34.5	
TLC	<11000	31	0	0	<0.001**
	>11000	34	22	64.7	
S Albumin g/dL	<3.5	24	21	87.5	<0.0001**
	>3.5	41	1	2.44	
ıronic (persistent) perito sepsis	Present	7	4	57.1	0.167
	Absent	58	18	31.03	

**-Statistically highly significant (p<0.01), *-Statistically Significant (p<0.05)

Volume 2, Issue 6; November-December 2019; Page No.200-207

Table 3: Various factors affecting mortality in patients with PUP

Parameter		N	Mortality	%	P Value
Sex	Male	57	4	7	0.4
	Female	8	0	0	
Age	<60 Years	51	0	0	0.021*
	>60 Years	14	4	28.5	
Associated illness	Present	5	1	20	0.075
	Absent	60	3	5	
Smoking	Present	37	2	5.4	0.8
	Absent	28	2	7.1	
Alcohol	Present	33	1	3	0.6
	Absent	32	3	9.3	
Peptic ulce Disease	Present	8	0	0	0.117
	Absent	57	4	7	
NSAID usage	Present	5	0	0	0.219
	Absent	60	4	6.66	
Time of surgery	<24 hours	32	0	0	0.089
	>24 hours	33	4	12.1	
Shock	present	24	3	12.5	0.61
	absent	41	1	2.4	
ASA Grade[13]	I	1	0	0	-
	II	26	0	0	
	III	32	0	0	
	IV	6	4	66.6	
Site	Duodenal	48	3	6.25	0.9
	Gastric	17	1	5.8	
Size of perforatior	< 1 cm	45	0	0	-
	>1 cm	20	4	20	
Peritoneal collectio	Bilious	37	1	2.7	0.183
	Purulent	28	3	10.7	
Amount of periton collection	<1 L	49	1	2.04	0.015
	>1 L	16	3	18.75	
Hemoglobin %	<11	10	0	0	-
	>11	55	4	7.2	
TLC	<11000	31	0	0	-
	>11000	34	4	11.76	
S Albumin	<3.5	24	3	12.5	0.103

Volume 2, Issue 6; November-December 2019; Page No.200-207

g/dL	>3.5	41	1	2.43	
Chronic (persister peritoneal sepsis	Present	7	3	42.85	<0.01**
	Absent	58	1	1.72	

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. Peptic ulcer perforation was common in younger male patients in age group of 30-50 years. In our study smoking and alcohol consumption were important risk factors in peptic ulcer perforation but these factors did not affect postoperative morbidity and mortality. Patients older than 60 years had a higher mortality rate (28% vs 0%) when compared to younger patients. Hence age 60 years and more is statistically significant in predicting postoperative morbidity and mortality in our study.

Risk of postoperative complications are closely related to the duration of perforation and shock on admission..33 patients underwent surgery 24 hours after the onset of symptoms.Out of them 63.6% patients developed postoperative complications, i.e. 20 times more compared to patients who underwent surgery before 24 hours. Most of our patients were referred to our hospital from rural area, probably be the reason for the delay in admission.24 patients presented with shock at the time of admission. Out of them 79.1% patients developed postoperative complications, that is 10 times more compared to patients without shock. The presence of shock on admission delay in the postoperative recovery of the patient due to renal, respiratory complications and sepsis. This also affects wound healing because of decreased perfusion.4 patients expired in our study. Mortality was 12.1% in patients who underwent surgery 24 hours after the onset of symptoms and 12.5% in patients with shock on admission.

Delay in surgery caused increased bacterial peritonitis and led to septicemic shock and renal failure in postoperative period.

There were only 4 deaths and all of them were ASA13 grade IV patients. Hence ASA grade is also important predictor of postoperative morbidity and mortality..43% patients had purulent peritoneal collection and 57% patients had bilious peritoneal collection.

24.6% had peritoneal collection of more than 1 litre, which means one among every 4 patient had a peritoneal collection of more than 1 litre. 56.25% had morbidity and 18.75% had mortality when the amount of peritoneal collection was more than 1 litre. The morbidity associated with more than 3.5g/dL levels of serum albumin was 2.44% whereas the morbidity was 87.5% when the serum albumin levels was less than 3.5g/dL. The mortality was 12.5% when the serum albumin levels was less than 3.5g/dL , and the mortality was 2.43% when the serum albumin levels was more than 3.5g/dL.In our study, age 60 years and more (p-value 0.021), presence of shock on admission (p-value <0.001), higher ASA grade (p-value <0.001), duration of perforation of more than 24 hours before surgery (p-value <0.027) and purulent peritoneal collection (p-value <0.001) were statistically significant predictors of morbidity and/or mortality. Most common complication was wound infection in 24 patients (36.9%) followed by 6 patients (9.2%) renal failure, septicaemia 4 patients (6.1%) and chronic (persistent) peritoneal sepsis 7(10.56%). Number of postoperative deaths was 4 (6.1%).

CONCLUSION

Perforated peptic ulcer disease is emerging as a frequent cause of acute abdomen in 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, presence of shock on admission, amount of peritoneal collection more than 1 litre, serum albumin levels less than 3.5g/dL and the presence of chronic (persistent) peritoneal sepsis are 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 33.8% and mortality rate is 6%.Age more than 60 years, duration of perforation of more than 24hours before surgery, presence of

Volume 2, Issue 6; November-December 2019; Page No.200-207

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.

References

1. Yamada‘s Textbook of Gastroenterology. 5th ed. Wiley Blackwell Publishing; 2008. pp. 1054-1070.
2. Oliver McAnena, Myles Joyce. Operative management of upper gastrointestinal disease. M. Farquharson M, Moran B. Farquharson's Textbook of Operative General Surgery. 9th ed. London: Hodder Arnold; 2005. pp. 285-315.
3. Lau WY, Leung KL, Zhu XL, Lam YH, Chung SCS, Li AKC. Laparoscopic repair of perforated peptic ulcer. Br J Surg. 1995;82(6):814–816.
4. Siu WT, Leong HT, Law BK, Chau CH, Li AC, Fung KH, et al.
5. Laparoscopic repair for perforated peptic ulcer: a randomized controlled trial. Ann Surg. 2002 Mar;235(3):313-9.
6. Dakubo JC, Naaeder SB, Clegg-Lamptey JN. Gastro-duodenal peptic ulcer perforation. East Afr Med J. 2009 Mar;86(3):100-9.
7. Dilip choksi , Pratik s shah. A Study of Factors Affecting Morbidity and Mortality in Patients of Peptic Perforation. International Journal of Current Medical And Applied Sciences. 2014;3(1): 10-15.
8. Dimple patel , Hardik dodia. Pre-Operative Factors Affecting Outcome in Cases of Peptic Perforation . International Journal of Science and Research. 2015;4(8): 181- 185.
9. Kocer, Belma et al. "Factors Affecting Mortality And Morbidity In Patients With Peptic Ulcer Perforation". Journal of Gastroenterology and Hepatology 22.4 (2007): 565-570. Web
10. Noguiera, Carlos et al. "Perforated Peptic Ulcer: Main Factors Of Morbidity And Mortality".World Journal of Surgery 27.7 (2003): 782-787. Web.
11. Parmar, Hiren, Moolchand Prajapati, and Rashmikant Shah. "Recent Trends In Peptic Perforation". International Journal of Medical Science and Public Health 2.1 (2013): 110. Web.
12. "Perforated Peptic Ulcer Disease: Factors Predicting The Mortality And Morbidity In A Tertiary Care Centre In Southern India.". The Internet Journal of Surgery 27.2 (2011): n. pag. Web.
13. Fischer SP, Bader AM, Sweitzer B. Preoperative evaluation. Miller RD,
14. Eriksson LI, Fleisher LA, Wiener-Kronish JP, Young WL. Miller‘s anesthesia. 7th ed. Philadelphia: Churchil Livingstone Elsevier, 2009, p 1027.
15. Wakayama T, Ishizaki Y, Mitsusada M, Takahashi S, Wada T, Fukushima Y, et al. Risk factors influencing the short term results of gastroduodenal perforation. Surg Today. 1994;24(8):681-7.
16. Gupta A,Brahnbhatt S, Kapoor R,Loken L, Sharma AC. Chronic peritoneal sepsis:myocardial dysfunction, endothelin and signaling mechanisms. Front Biosci. 2005Sep1;10:3183-205.

Volume 2, Issue 6; November-December 2019; Page No.200-207