

Evaluation of Boey's Score in Perforated Peptic Ulcer at Patna Medical College and Hospital

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Abstract: Even with invent of modern medicine along with the use of sophisticated surgical and critical care instruments, peptic ulcer perforation continues to be a major surgical problem. In the present study, a simple scoring system, the Boey's score was evaluated in determining the associated risk factor along with to determine the predictability of the score for morbidity and mortality associated with peptic ulcer perforation. Altogether 39 patients meeting the inclusion criteria were incorporated in the study conducted at Patna Medical College and Hospital between July 2016 and June 2017. A higher incidence of morbidity along with significantly prolonged hospital stay was observed in patients with Boey's score of 2 and 3. The mortality rate was also found to be significantly higher in patients with higher Boey's score. For Boey's score 0, 1, 2 and 3 the mortality rate was found to be 0%, 12.5%, 33.33% and 66.67% respectively. Considering the simple scoring system based on easily obtained parameters at the time of admission, Boey's score can be helpful in prediction of postoperative morbidity and mortality in case of perforated peptic ulcers.

Keywords: Peptic ulcer perforation, Boey's score, Scoring system.

INTRODUCTION

Peptic ulcer disease (PUD) has been defined as the break in the lining of the stomach, first part of the small intestine or occasionally the lower oesophagus which results due to imbalance between stomach acid-pepsin secretion and mucosal defence barriers.

Worldwide approximately four million people are affected annually [1]. Annual incidence of PUD reported across several studies (one from USA and six from Europe) showed noteworthy consistency, ranging from 0.10% to 0.19% based on physician-diagnosed PUD and from 0.03% to 0.17% based on hospitalization data [2].

10%-20% of patients with PUD are associated with complications, and that includes bleeding, perforation, penetration and in the long run even obstruction [3]. Bleeding is the most frequent complication followed by perforation in 2 to 14% of the ulcers causing acute illness [4, 5]. With the advent of modern endoscopic and interventional radiological procedure though it has been found that outcome of bleeding ulcers have improved but the morbidity and mortality following ulcer perforation has remained nearly unchanged. Perforation being a serious complication of PUD presenting with acute abdomen, its lifetime prevalence in patients with PUD has been quoted to be about 5% and with mortality rate of around

27% and complication has been reported in up to 50% of patients [6-12].

Numerous scoring system for the prediction of outcome has been reported and that includes; APACHE score (Acute Physiologic and Chronic Health Evaluation), MOF Score (Multi Organ Failure), SAPS (Simplified Acute Physiology Score), MPI score (Mannheim Peritonitis Score), Boey Score, PULP score (Peptic ulcer perforation score) along with several other scoring systems which are cumbersome and difficult to use in all emergency setup and some even incorporating the intra operative and postoperative parameters. Amongst all Boey and PULP score are specifically proposed and designed for mortality prediction in patients with perforated peptic ulcers although both have their own shortcomings and pitfalls. Hence no single risk prediction system has been accepted universally and the optimal way of outcome prediction in these patients are not known. The present study was thus designed to evaluate Boey's Score in Perforated Peptic Ulcer at Patna Medical College and Hospital.

MATERIALS AND METHODS

The present prospective, observational, cohort study was conducted at the Department of Surgery, Patna Medical College and Hospital over a period of 12 months from July 2016 to June 2017.

Inclusion criteria

- Patients aged >14 years with diagnosis of peptic ulcer perforation undergoing emergency laparotomy on the even Wednesdays of the month.

Exclusion criteria

- Patients who left with incomplete treatment due to financial or other constraints.

- Cases with intra operative or histopathological diagnosis other than PPU.

The particular days of the month were such chosen to avoid variation in outcome due to different surgical units operating on different days of the week and hence to maintain uniformity of the team/unit under which the patients were managed. The diagnosis of perforated peptic ulcer was made based on clinical symptoms, past history of waxing and waning dyspepsia, epigastric pain, history of regular intake of NSAIDS, consumption of alcohol, smoking along with clinical sign of peritonitis. The detailed clinical evaluations were complemented with diagnostic and supportive investigations to achieve the diagnosis of perforated peptic ulcer.

Table-1: Boey's Score

Parameters	Defining Criteria	Boey's Score
Duration of perforation	Time interval between onset of severe abdominal pain and surgery at hospital	<24 hours : Score 0 >24 hours : Score 1
Concomitant severe medical illness	Heart disease, Pulmonary disease, Liver failure, Diabetes, Renal failure, Immuno compromised status	Absent : Score 0 Present : Score 1
Preoperative Shock	Systolic BP less than 90 mm of Hg Mean arterial pressure less than 60 Reduction in Systolic BP more than 40 mm of Hg from baseline.	Absent : Score 0 Present : Score 1

Boey's Score (Table-1) of individual patients were calculated and based, on which the patients were divided into four groups as below:

- Group 1: No risk factor with score of Zero
- Group 2: One risk factor with score of One
- Group 3: Two risk factor with score of Two
- Group 4: All three risk factor with score of Three

All patients underwent exploratory laparotomy with peritoneal lavage and modified Graham's patch repair of the perforation site was done. Intravenous antibiotics and opioid analgesics were used and patients were switched to anti helicobacter therapy for 10 days once the patients resumed oral feeding. Patients were routinely followed after 1 week of discharge in Surgical

OPD. Significant complication in the form of leak, surgical site infection, burst abdomen, respiratory compromise due to atelectasis/ pneumonia, renal failure requiring dialysis was measured as morbidity along with length of hospital stay. Mortality was defined as death of the patient during the period of hospital stay. The patients demographic profile, Boey's score, intra operative finding and the outcome were documented and analysed using appropriate statistical tools.

RESULTS

During the study period, altogether 39 patients meeting the inclusion criteria were included in the study.

Table-2: Patient demographics

	Total	Patient distribution amongst the group			
		Group 1: Boey Score 0	Group 2: Boey Score 1	Group 3: Boey Score 2	Group 4: Boey Score 3
Number of patients	39	8	10	12	9
Age Distribution (in years)	48.23±11.83	46.75±12.43	47.30±12.90	49.58±10.00	48.78±14.07
Sex Distribution	Male 28 Female 11	Male 5 Female 3	Male 7 Female 3	Male 9 Female 3	Male 7 Female 2

The age distribution of patients in the 4 groups were statistically similar (p value 0.952) and the age of

patients ranged between 24 to 71 years. Of the total 39 patients, 31 patients were referred from other health

centres and 8 patients came directly to our institution with complains of acute onset pain abdomen.

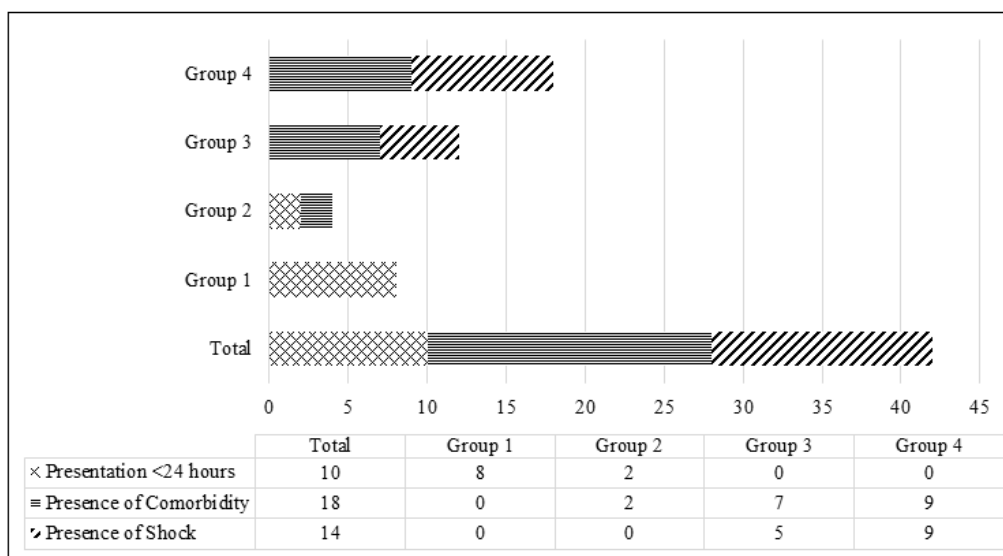


Fig-1: Boey's Score parameters in different groups

Amongst the 39 cases operated, 29 patients (74.36%) had intra operative finding of duodenal ulcer

perforation whereas 10 patients (25.64%) had the finding of pre pyloric perforation.

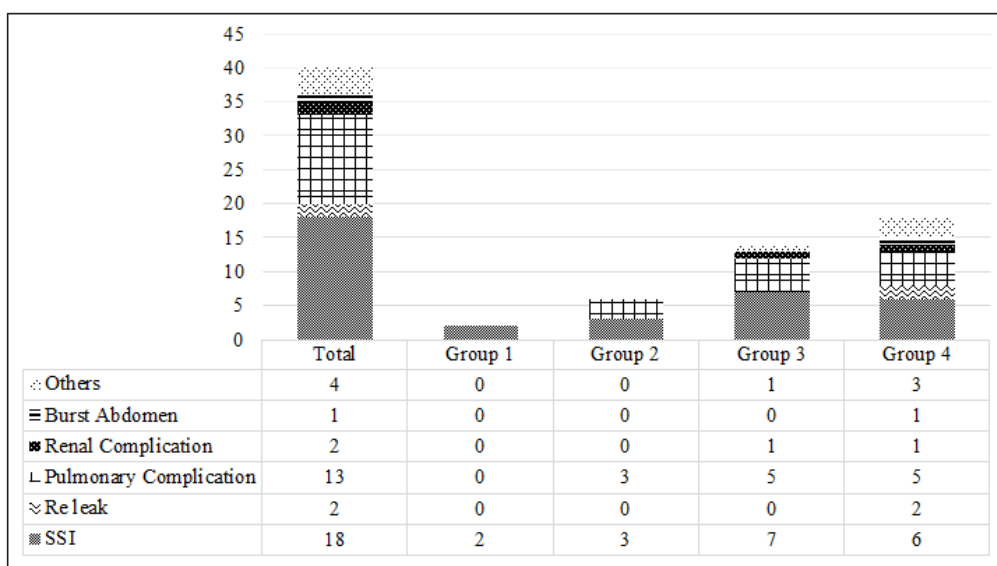


Fig-2: Complication in different groups

Overall comparison of morbidity/complication in the different study group revealed significantly higher percentage of morbidity in patients with Boey's Score 2 and 3.

During the study, there were 11 mortalities and 28 patients were discharged and followed up (Table-3).

Table-3: Comparison of morbidity amongst different groups

		Group				Total	p Value	Significance
		1	2	3	4			
Morbidity	No	6 (75)	4 (44.44)	0 (0)	0 (0)	10 (35.71)	0.006	Significant
	Yes	2 (25)	5 (55.56)	8 (100)	3 (100)	18 (64.29)		
Total		8 (100)	9 (100)	8 (100)	3 (100)	28 (100)		

Table-4: Mortality amongst different groups

	Total	Group 1	Group 2	Group 3	Group 4

No of Mortality	11	0	1	4	6
Percentage of total mortality	100%	0%	9.09%	36.36%	54.54%
Intra group percentage of mortality	28.21%	0%	12.5%	33.33%	66.67%

The difference in mortality amongst the 4 group of patients was statistically significant (p value

0.008), with higher percentage of mortality observed in patients with high Boey's score.

Table-5: Comparison of average length of stay in different groups (Excluding mortality)

	Group 1	Group 2	Group 3	Group 4
Average length of stay (in days)	7.88 ± 2.03	10.33 ± 2.45	15.63 ± 3.54	19.33 ± 2.08
P value	< 0.001			
Significance	Significant			

The mean duration of hospital stays of patients of different groups excluding mortality cases were found to be statistically significantly higher with higher Boey's score. Early discharge at 5th post-operative day was observed in patient with Boey's Score 0 (Group 1) and the maximum stay of 21 days was observed in a patient with Boey's Score 3 (Group 4). However, mortality was observed in patient as early as on post-operative day 1 and as delayed as on post-operative day 14, with both patients having Boey's Score 3 (Group 4).

DISCUSSION

Peptic ulcer disease (PUD) results from an imbalance between stomach acid-pepsin and mucosal defence barriers. The incidence of PUD has been estimated at around 1.5% to 3% [13]. By and large peptic ulcer disease remains a clinical entity associated with high morbidity and mortality. The study involved categorization of the patients into four groups based on individual Boey's score calculated at the time of admission. The scoring system based on three parameters (duration of perforation, associated comorbidity and preoperative shock) has proved to be a quick and simple tool to foresee the morbidity and to predict mortality amongst patients of peptic ulcer disease.

Altogether 39 patients were included in this prospective study done in a single surgical unit over a period of one year. The study reflected higher incidence of peptic ulcer disease in male population with 28 out of 39 patients being male, a finding that is in line with various other studies which have concluded higher incidence of PUD in male sex [13-16]. The mean age of patient included in our study was 48.23±11.83 years, reflecting higher incidence of PUD in elderly patients. Studies have revealed that patients tend to be young male smokers in developing countries whereas in developed countries, patients are more of elderly age group with multiple co-morbidities and with history of use of non-steroidal anti-inflammatory drugs (NSAIDs) or steroids [17-18]. A reason of our patients being of higher age group could be because most of the patients (18 out of 39) had associated co morbidities and a major number of patients (79.49%) were referral patients.

As reported in literature, comorbidities were found to be important prognostic factors in the present study [19, 20]. Of the three parameters of Boey's score, presence of comorbidity and preoperative shock was most frequently encountered with an incidence of 18 out of 39 and 14 out of 39 respectively. Comorbidities also correlated with mortality, which is in agreement with other studies [19, 21, 22]. Nine patients out of total eleven patients who succumbed to illness had associated comorbidity and seven out of these eleven were in a state of shock.

In literature, post-operative morbidity rate in patients undergoing surgery for peptic ulcer perforation ranges between 21–42% [16, 23-25]. Surgical site infection and pulmonary complications have often been the reason for post-operative morbidity. In the present study, the morbidity rate was found to be 64.29%, which was higher compared to other studies, but in line with the literature, surgical site infections (64.29%) and pulmonary complications (46.43%) were common cause of post-operative morbidity in this study. For individual group the morbidity was found to be 100% in patients of group 3 and 4 (Boey's score 2 and 3 respectively).

In our study the average length of hospital stay, excluding of those who succumbed to their illness was 12.11 ± 4.72 days. For patients with Boey's score zero and 1 the average stay was found to be 7.88 ± 2.03 and 10.33 ± 2.45 days respectively and for patients with Boey's score 2 and 3 it was 15.63 ± 3.54 and 19.33 ± 2.08 days respectively. This difference in average length of stay of patient was found to be statistically significant and it reiterates the fact observed in similar studies that patient with higher Boey's score require more duration to recuperate from illness and hence summing to overall morbidity of the patients.²⁶

11 mortalities were encountered in the study population with an overall mortality rate of 28.21%. On comparison with respective Boey's score, an increasing rate of mortality was observed with increase in Boey's score. There was 1 mortality in patient with Boey's score 1 (9.09% of total mortality and 12.5% amongst patient with similar score), 4 in patient with score 2

(36.36% of total and 33.33% amongst patient with similar score) and a total of 6 mortalities in patients of group 4 with Boey's score 3 (66.67% of total and 54.54% intra group). This increasing rate of mortality observed with increasing Boey's score was found to be statistically significant and parallel to findings of other studies [26, 27].

CONCLUSION

Despite the recent advances in modern medicine and goal directed and aggressive operative and post-operative management, the successful treatment of peptic ulcer perforation remains challenging for the clinician and it remains a serious surgical problem. A sensitive as well as specific preoperative prediction scoring system for patients with perforated peptic ulcer remains indispensable so that timely initiation of aggressive treatment be initiated for high risk patients determined using the scoring system.

Boey's score incorporating simple parameters which can be easily assessed at the time of admission, thus can be used as a simple and precise tool for prediction of postoperative morbidity and mortality in case of perforated peptic ulcers.

Conflict of interest: None to declare

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