

FREQUENCY OF HIGH BOEY SCORE AND ITS ONE MONTH MORTALITY AFTER SURGERY FOR PERFORATED PEPTIC ULCER DISEASE

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ABSTRACT

Background: Peptic ulcer perforation is one of the commonest gastrointestinal perforations in Pakistan. The vast majority of peptic ulcer perforation require emergency operation and to facilitate its management to improve the outcomes, it is important to stratify patients into different categories based on the likelihood of morbidity and mortality, so that high risk patients can receive more appropriate treatment and greater intensive care. The objective of this study was to determine the frequency of high Boey's score and its one month mortality after surgery for perforated peptic ulcer disease in our population.

Material and Methods: This prospective cross sectional study was conducted in surgical department of Post Graduate Medical Institute Lady Reading Hospital, Peshawar from January 2010 to December 2012. All patients were immediately worked up with detailed history and clinical examinations and routine pre-operative baseline investigations were sent and were carefully evaluated to detect high Boey score. All patients were operated on the next immediate list after taking informed consent. All patients were kept in ward for 5th post operative days and were discharged on 6th post operative day if indicated. All patients who have high Boey score were regularly followed till one month after surgery to detect one month mortality. Data was collected on a set proforma and analyzed using SPSS version 16.

Results: A total of 130 patients of perforated peptic ulcer disease were included in the study. Male to female ratio was 2.17:1. Average age of the patients was 44.46 years \pm 10.65SD with range 18-68 years. The mortality in perforated peptic ulcer was observed in 33(25.38%).

Conclusion: The Boey's score was found in majority of mortality cases operated for perforated peptic ulcer and can assist in risk stratification and triage.

Key Words: Peptic ulcer, Boey Scoring, mortality, perforated.

INTRODUCTION

Perforated peptic ulcer is a serious condition with an overall reported mortality of 5%-25%, rising to as high as 50% with age¹. Being closely related to advanced age, increased burden of co morbidity may partially explain the higher mortality among elderly patients. Nevertheless, virtually no data exist on the influence of comorbidity on age-related increase in mortality of perforated peptic ulcer.^{1,2}

In spite of improved understanding of the multifactorial etiology of peptic ulcer disease (PUD),³⁻⁵ life-threatening complications including acute hemorrhage or perforation occur in a considerable proportion of patients. The mortality rate ranges from 10-40% among patients with perforation,^{6,7} and immediate

surgery is the treatment of choice in most patients with suspected perforated peptic ulcer (PPU)⁸.

Peptic ulcer perforation is one of the commonest gastrointestinal perforations in Pakistan. Due to rapidly spreading peritonitis, it is a life threatening complication of PUD⁹.

Perforated peptic ulcer (PPU) is the most common indication for emergency gastric operation. Perforation occurs in about 2-10% of peptic ulcers⁶. The vast majority of PPU patients require emergency operation. The incidence of recurrent ulcer after simple closure could be very low if patients receive appropriate treatment of HP infection. However, patients with PPU still have a high rate of morbidity and mortality, and surgical outcomes could vary among hospitals.^{9,10}

To facilitate management of PPU patients and to improve the outcomes, it is important to stratify patients into different categories based on the likelihood of morbidity and mortality, so that high-risk patients can receive more appropriate treatment and greater intensive care. Several risk scores for the prediction of outcomes in PPU patients have been developed. However, their accuracy in predicting mortality and morbidity is still questionable¹⁰⁻¹². Commonly utilized risk scores include Boey risk score, Peptic Ulcer Perforation (PULP) score,

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American Society of Anesthesiology (ASA) score¹³, Mannheim Peritonitis Index (MPI) 10 Mortality Probability Model (MPM) II¹⁴.

Boey score has determined a group of risk factors for mortality in perforated peptic ulcer, preoperative BP < 100 mmHg, delayed presentation > 24 h, and major medical illness present like Ischemic heart disease, Congestive heart failure, Chronic obstructive pulmonary disease, Long term steroid use and Recent cerebrovascular stroke¹⁵.

Boey's score, which is a score based upon above mentioned factors has been found to be a useful tool in predicting outcome with a mortality rate of 1.5%, 14.4%, 32.1% and 100% for Boey Score 0, 1, 2 and 3 respectively¹⁶⁻¹⁹ and a very helpful tool in decision making¹⁰. In another study, the reported pattern of mortality was 1%, 8%, 33% and 38% for Boey scores 0, 1, 2 and 3 respectively¹⁰ while another study reported by Saber A et al, the overall mortality was observed to be 20.8% among patients with high Boey score at presentation with PPU¹⁵.

The purpose behind doing this study is to determine the frequency high Boey score and its mortality after surgery for perforated peptic ulcer disease. This study is designed owing to variation present in literature regarding frequency of mortality after surgery for PPU with high Boey score and this study will provide us with statistics of mortality in our local population presenting with perforated peptic ulcer since the mortality and other surgical outcome varies from hospital to hospital.

OBJECTIVE

To determine the frequency of high Boey score and its one month mortality after surgery for perforated peptic ulcer disease.

MATERIAL AND METHODS

This descriptive prospective cross sectional study was conducted in the Department of Surgery, Lady Reading Hospital, Peshawar from January 2010 to December 2012. Consecutive (Non-probability) sampling. patients presenting with Perforated Peptic Ulcer and age group above 18 years and of either gender were included in the study. Patients with history of steroid intake in the last one month, Diabetes Mellitus with Fasting Blood Glucose of > 126mg/dl and history of intake of anti diabetic drugs, history of abdominal surgery in the last one month for any indication, gastric cancer diagnosed on the basis of medical records and Patients with American society of Anesthesia class IV and V, with re perforation on history and medical records were excluded.

The study was conducted after approval from hospitals ethical and research committee. All patients meeting the inclusion criteria and presenting with perforated peptic ulcer disease (as per criteria mentioned in

operational definition above) were included in the study through out patient/ emergency department and were immediately admitted in the surgical ward for further evaluation. The purpose and benefits of the study were explained to all patients and they were assured that the study is done purely for research and data publication and a written informed consent were obtained from patients attendants.

All patients were immediately worked up with detailed history and clinical examinations and routine pre operative baseline investigations were sent. All the patients were carefully evaluated to detect high Boey score.

All patients were operated on the next immediate OT list by single experienced general surgeon fellow of CPSP. The standard guidelines for surgery were followed for all patients including Perforation closure with Graham's patch omentoplasty were performed in all cases. Standard surgical cares were followed in all patients including antibiotic cover and fluid diet once the bowel sounds return. All patients were kept in ward for 5 post operative days and were discharged on 6th post operative day if indicated. All patients who have high Boey score were regularly followed till one month after surgery to detect one month mortality.

All the above mentioned information including name, age, gender and address were recorded in a pre designed proforma. Bias and confounding variables were controlled by strictly following exclusion criteria. All the data were entered and analyzed through SPSS version 10. Frequency and percentages were calculated for categorical variables like gender, high Boey score and one month mortality. Mean \pm SD will be calculated for numerical variables like age. High Boey score and its one month mortality were stratified among the age and gender to see the effect modifiers. All the results were presented as tables and charts.

RESULTS

A total of 130 patients of perforated peptic ulcer disease were included in the study. There were 89 (68.46%) were males and 41(31.54%) were females. Male to female ratio was 2.17:1.

Average age of the patients was 44.46 years \pm 10.65SD with range 18-68 years. Patient's age was

Table 1: Age wise distribution of the patients

	Frequency	Percent
≤ 30.00	10	7.7
31.00 - 45.00	60	46.2
46.00 - 60.00	54	41.5
61.00+	6	4.6
Total	130	100.0

Table 2: Age wise distribution of mortality

		Mortality		
		Yes	No	Total
age (in years)	<= 30.00	1 10.0%	9 90.0%	10 100.0%
	31.00 - 45.00	9 18.0%	51 82.0%	60 100.0%
	46.00 - 60.00	18 33.3%	36 66.6%	51 100.0%
	61.00+	3 50%	3 50%	6 100.0%
Total		31 23.84%	99 76.18%	130 100.0%

Table 3: Gender wise distribution of mortality

		Mortality		
		Yes	No	Total
Gender	Male	22 24%	68 76%	89 100.0%
	Female	9 21.9%	32 78.1%	41 100.0%
Total		31 23.84%	99 76.18%	130 100.0%

Table 4: Boye score wise distribution of mortality

		Mortality		
		Yes	No	Total
Base- line score	<2.00	7 7.07%	93 92.930%	99 100.0%
	2.00+	24 77.4%	7 22.6%	31 100.0%
Total		33 25.38%	97 74.6%	130 100.0%

divided in four categories, out of which most common age group for perforated peptic ulcer was 31-45 years. (Table 1)

The mortality in perforated peptic ulcer was observed in 31 (25.38%) while in 97 (74.62%) patients show no mortality.

Age wise distribution of mortality shows that mortality in old age was little bit high as that of younger age. The patients having age less than or equal to 30 years of age have mortality 20% while no mortality was also 80%, age group 31-45 years contain 26.7% mortality and 73.3% shows no mortality, 46-60 years age groups gave 22.2.8% mortality with 77.8% no mortality and patients having more than 60 years of age have 50% mortality while 50% have non mortality in per perforated peptic ulcer patients. (Table 2)

Gender wise mortality in perforated peptic ulcer shows that genders have a little bit roles over mortality. (Table 3)

Boye score wise mortality in perforated peptic ulcer patients showed that higher the boye score the mortality is more. (Table 4)

DISCUSSION

During the last decade, fast-track surgery and evidence based in-hospital care have been sought to be implemented in various fields of surgery, leading

to a reduction in morbidity and mortality²⁰. In patients with PPU, mortality has been reduced considerably by the implementation of a standardized evidence based in-hospital care protocol²¹. The limited number of ICU and high dependency unit beds emphasizes the importance of individual risk stratification²².

Early and accurate identification of patients with increased risk of adverse outcome is needed to plan and target the level of perioperative monitoring and treatment. Thus, a clinical scoring system should be able to predict adverse outcome with a high degree of precision. Furthermore, the score should be easy to calculate, preferably bedside. These characteristics have proven difficult to realize²³.

In the present study, perforated peptic ulcer disease were found to be most common in the fourth decade of life and tended to affect more males than females, with a male to female ratio of 1.3:1 which is comparable with other studies in developing countries²⁴⁻²⁷.

Our demographic profile is in sharp contrast to what is reported in developed countries where the majority of the patients are above 60 years and the incidence is higher in elderly females taking ulcerogenic medications²⁸.

The most well-known prediction rule in PPU patients is the Boey score, which seeks to predict mortality based on the presence of major medical illness, pre-operative shock, and perforation longer than 24 h²⁹. In the original study by Boey et al., the in-hospital mortality proportion increased progressively with the number of prognostic variables, being 0%, 10%, 45.5%, and 100% in patients with none, one, two, or all three variables, respectively. The Boey score has been re-evaluated in a number of relatively small (n <450) and single-centre studies, but neither Irvin,³⁰ Lee et al.,³¹ Chandra and Kumar,³² Makela et al.,³³ nor Lohsiriwat et al.³⁴ could fully replicate the convincing results found by Boey et al.

In the present study, the Boey score had the poorest discriminatory ability of survival. In the Boey score, in-hospital mortality increases progressively with the presence of major medical illness, preoperative shock, and perforation longer than 24 h 29. The Boey score has been re-evaluated in a number of single center studies³⁵⁻³⁸, though without being able to fully replicate the convincing results found by Boey et al. Mortality and morbidity following perforated peptic ulcer (PPU) is substantial, and mortality proportions of 25-30% have been reported in population based studies³⁹⁻⁴⁴.

Irvin⁴⁵ attempted to validate the Boey Score on a cohort of 265 consecutive patients who had operations for perforated peptic ulcer. 176 of these were 70 years or above, of which two-thirds were female. All 5 patients with three Boey Score risk factors died. At a cut-off of two risk factors the accuracy was less good,

with 13 patients surviving from 29 (false positive rate 45%) Mortality rates for the patients over 70 years are shown in Table 4. Higher mortality rates compared to Boey et al reflect the more severely-ill group of patients in this later study.

A large number of prognostic factors for morbidity and mortality following PPU have been characterized 39 and a number of clinical prediction rules proposed^{43,44}.

The Boey score does not comprise any prognostic factors related to patient age or concomitant medication use otherwise well-established prognostic factors in PPU,²¹ which could be one explanation for the lower accuracy of the Boey score. The most well-known prediction rule in PPU is the Boey score which seeks to predict mortality based on the presence of major medical illness, preoperative shock, and perforation longer than 24 h 29.

In the original study by Boey et al., the in-hospital mortality proportion increased progressively with the number of prognostic variables, being 0%, 10%, 45.5%, and 100% in patients with none, one, two, or all three variables, respectively.

The Boey score is crude, consisting of only three parameters. Consequently, it does not include many of the other existing and well-examined prognostic factors for adverse outcome in PPU, e.g. old age, tachycardia, and acute renal failure²¹. This might explain the inferior performance in the present study. On the other hand, it is simple to calculate and was created specifically for patients with PPU.

CONCLUSION

In patients surgically treated for PPU, the Boey score, gives mortality. Thus, in the clinical setting, the scores can rule out mortality within 30 days of surgery with a high degree of precision in a PPU cohort with a similar case mix. In order to be able to precisely predict adverse outcome in PPU patients, we suggest that a score developed within PPU patients and including both pre-morbid objective measures and current objective measures is used.

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