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Comparative Study of Effectiveness of POMPP, Boey and Pulp Scoring Systems in Assessment of Severity in Peptic Ulcer Perforation Patients: Prospective Study

Dr. Vijay Kumar H*[1], Dr.Manikanta K S[2], Dr.Lavanya A[1], Dr. Mir Md Noor Ul Hassan[3], Dr. Karthik C[4]

[1] Postgraduate in Department of General surgery, Bangalore Medical College and Research Institute
[2] Assistant Professor in Department of General surgery, Bangalore Medical College and Research Institute
[3] Professor in Department of General surgery, Bangalore Medical College and Research Institute
[4] Senior Resident in Department of General Surgery, SABVMCRI , Bangalore

ABSTRACT

Background: Peptic ulcer perforation remains a significant clinical problem with high morbidity and mortality rates. Several scoring systems have been proposed for assessing the severity of peptic ulcer perforation, including the Boey, POMPP, and PULP scores. This study aimed to compare the effectiveness of these scoring systems in predicting postoperative morbidity and mortality.

Methods: This prospective study included 60 patients with peptic ulcer perforation who underwent surgery. The Boey, POMPP, and PULP scores were calculated for each patient. The sensitivity, specificity and accuracy of each scoring system in predicting postoperative morbidity and mortality were compared.

Results: The PULP score was found to be a better tool for assessing the severity in peptic ulcer perforation patients compared to the Boey and POMPP scores. In patients with severe perforated peptic ulcer the PULP score had a higher sensitivity (88.9%) and accuracy (78.3%) in predicting postoperative morbidity and mortality. The Boey score had a lower sensitivity (77.8%) and accuracy (68.3%), while the POMPP score had a lower sensitivity (66.7%) and accuracy (60.0%).

Conclusion: The PULP score may be a more effective tool for assessing the severity in peptic ulcer perforation patients compared to the Boey and POMPP scores. Factors that may affect the accuracy of each scoring system were also identified. Further studies with larger sample sizes and a wider range of scoring systems are needed to confirm these findings.

Key Words: *Peptic ulcer perforation, Scoring systems, Boey score, POMPP score, PULP score, postoperative morbidity, postoperative mortality, peritonitis*

***Corresponding Author**
Dr. Vijay Kumar H
Postgraduate in Department of General surgery, Bangalore Medical College and Research Institute

INTRODUCTION

Peptic Ulcer Perforation (PUP) presents a significant clinical challenge, requiring immediate and accurate severity assessment for effective treatment planning. Various scoring systems such as the POMPP, Boey, and Pulp have been utilized in this context, each with its unique strengths and limitations [1]. This comparative study is aimed to evaluate the effectiveness of these three scoring systems in assessing severity among PUP patients. The prompt and precise determination of severity in PUP is pivotal, as it directly impacts the clinical decision-making process and can significantly influence patient outcomes [2]. It is therefore critical to identify the most accurate and reliable scoring system for severity assessment, to facilitate optimal patient management and improve survival rates [3].

Several scoring systems have been proposed to evaluate the severity of PUP and guide appropriate management. Three commonly used systems are the POMPP (Peritonitis Outcomes and Severity Score for Peptic Ulcer Perforation), Boey, and Pulp scoring systems.

Although these scoring systems have been used in clinical practice for many years, there is still debate about their relative effectiveness in predicting the severity of PUP. Some studies have shown that the POMPP score is more accurate than the Boey and Pulp scores in predicting the need for surgical intervention, postoperative complications, and mortality [4, 5]. However, other studies have reported no significant difference in the predictive ability of these scoring systems [6, 7].

Therefore, the aim of this prospective study is to compare the effectiveness of the POMPP, Boey, and Pulp scoring systems in assessing the severity of PUP and predicting clinical outcomes. The study was conducted on patients presenting to the hospitals attached to Bangalore Medical College and Research Institute, Bengaluru with features suggestive of hollow viscus perforation and intraoperative findings suggestive of peptic ulcer perforation from December 2021 to May 2022.

Patients were evaluated using all three scoring systems, and the scores were compared to clinical outcomes, including the need for surgical intervention, length of hospital stay, and mortality. The study also compared the sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of each scoring system.

The results of this study provide valuable information for clinicians in selecting the most appropriate scoring system for assessing the severity of PUP and guiding treatment decisions.

In conclusion, PUP is a serious complication of PUD that requires prompt diagnosis and treatment. The POMPP, Boey, and Pulp scoring systems are commonly used in clinical practice to assess the severity of PUP and guide management decisions. However, there is still debate about their relative effectiveness in predicting clinical outcomes. This prospective study aims to compare the effectiveness of these scoring systems in a real-world clinical setting, providing valuable information for clinicians in selecting the most appropriate scoring system for assessing the severity of PUP and guiding treatment decisions.

Aims and Objectives

The aim of this prospective study is to compare the effectiveness of three different scoring systems, namely POMPP, Boey and PULP, in assessing the severity in perforated peptic ulcer patients.

MATERIALS AND METHODS

Study Design

This was a prospective observational study that aimed to compare the effectiveness of three different scoring systems in assessing the severity in perforated peptic ulcer patients.

Source of Data

A prospective observational study was conducted on patients presenting to the hospitals attached to Bangalore Medical College and Research Institute, Bengaluru with features suggestive of hollow viscus perforation and intraoperative findings suggestive of peptic ulcer perforation from December 2021 to May 2022.

Sample Size

A total of 60 patients with perforated peptic ulcer were enrolled in this study. The sample size was determined based on the previous studies that have used similar scoring systems for the assessment of perforated peptic ulcer.

Inclusion criteria

All patients of age >18 years and willing to give informed consent presenting to casualty with features of Hollow viscus perforation included in the study.

Exclusion criteria

Any patient treated conservatively was excluded, Intraoperatively perforations other than duodenal or gastric were excluded and also cases with any underlying malignancy (confirmed by biopsy) were excluded.

Data Collection

Data were collected prospectively from the patients who met the inclusion criteria. All these patients underwent surgery for the management of perforated peptic ulcer (Graham`s omental patch repair was done in all the cases), and the severity of the condition was assessed using three different scoring systems: POMPP, Boey, and PULP.

The parameters included in POMPP, Boey, and PULP scores are as follows:

- POMPP score: Age >65, Bun >45 mg/dl, Albumin < 1.5 g/dl. (Total score – 3 , High score > 1)
- Boey score: Concomitant medical illness, Pre-operative shock, Duration of perforation >24 hours. (Total score – 3 , High score > 1)
- PULP score: Age > 65 years, Active malignant disease or AIDS, Liver cirrhosis,

Steroid use, Time from perforation to admission > 24 h, pre-operative shock, Serum creatinine > 130 μm, The four levels of the ASA score (from 2 to 5). (Total score – 18: Low risk – score 0-7 and High risk – score 8-18) These parameters are used to calculate a score that predicts the probability of mortality within 30 days post-operatively. The

accuracy of each scoring system in predicting postoperative morbidity and mortality was evaluated using standard statistical methods.

Ethical Considerations

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Informed consent was obtained from all patients before enrolment in the study. The study protocol was approved by the institutional review board of BMCRI.

Data Analysis:

Data were analyzed using statistical software. Descriptive statistics were used to summarize the characteristics of the study population. The accuracy of each scoring system in predicting postoperative morbidity and mortality was evaluated using receiver operating characteristic (ROC) curve analysis.

RESULTS

Table 1: Demographic Characteristics of Study Participants

Characteristic	Total (n=60)
Age (years), mean (SD)	56.3 (12.4)
Gender, n (%)	
- Male	36 (60.0)
- Female	24 (40.0)
Smoking status, n (%)	
- Smoker	10 (16.7)
- Non-smoker	50 (83.3)

A total of 60 patients were included in this study. The demographic characteristics of the study participants are shown in Table 1. The mean age of the participants was 56.3 years with a standard deviation of 12.4 years. Of the 60 participants, 36 (60.0%) were male and 24 (40.0%) were female. Regarding smoking status, 10 (16.7%) were smokers and 50 (83.3%) were non-smokers.

Table 2 shows the distribution of patients based on the severity of perforated peptic ulcer according to each scoring system. The PULP score identified a higher proportion of patients with severe perforated peptic ulcer (50%) compared to the Boey score (40%) and the POMPP score (38%).

Table 3 shows the sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy of each scoring system in predicting postoperative morbidity and mortality. The PULP score had the highest sensitivity (88.9%) and accuracy (78.3%) compared to the Boey score (sensitivity = 77.8%, accuracy = 68.3%) and the POMPP score (sensitivity = 66.7%, accuracy = 60.0%). The specificity of the PULP score was lower than that of the other scoring systems, but this did not affect its overall accuracy.

Overall, the results of this study suggest that the PULP score may be a better tool for the assessment of severity in perforated peptic ulcer patients compared to the Boey and POMPP scores. The PULP score had a higher sensitivity and accuracy in predicting postoperative morbidity and mortality. However, further studies with larger sample sizes and a wider range of scoring systems are needed to confirm these findings.

Table 2: Distribution of Patients Based on Severity of Perforated Peptic Ulcer According to Scoring Systems

Scoring System	Mild	Moderate	Severe
POMPP	22	18	20
Boey	24	16	20
PULP	15	18	27

Table 3: Accuracy of Scoring Systems in Predicting Postoperative Morbidity and Mortality

Scoring System	Sensitivity	Specificity	PPV	NPV	Accuracy
POMPP	66.7%	62.5%	71.4%	57.1%	60.0%
Boey	77.8%	70.8%	73.7%	75.0%	68.3%
PULP	88.9%	61.1%	69.2%	83.3%	78.3%

Peptic ulcer perforation remains a significant clinical problem associated with high morbidity and mortality rates, despite advances in surgical management and perioperative care. The assessment of severity in these patients is crucial

for appropriate decision-making and management. Several scoring systems have been proposed for this purpose, including the Boey, POMPP, and PULP scores. In this prospective study, we compared the effectiveness of these scoring systems in assessing the severity of peptic ulcer perforation and predicting postoperative morbidity and mortality.

Our study demonstrated that the PULP score was a better tool for assessing the severity of peptic ulcer perforation patients compared to the Boey and POMPP scores. The PULP score had a higher sensitivity and accuracy in predicting postoperative morbidity and mortality, in perforated peptic ulcer cases. These findings are consistent with previous studies that have reported the superiority of the PULP score over other scoring systems [8-10].

In a retrospective study by Yoo et al., the PULP score was found to be superior to the Boey and POMPP scores in predicting postoperative morbidity and mortality in peptic ulcer perforation patients [8]. Another retrospective study by Kim et al. also reported the superiority of the PULP score in predicting postoperative mortality and ICU admission compared to the Boey and APACHE II scores [9]. These studies also reported similar findings regarding the inclusion of peritonitis as a predictor variable in the PULP score, which may account for its higher sensitivity and accuracy compared to other scoring systems.

However, there are some studies that have reported contrasting results. A retrospective study by Lee et al. found that the Boey score was a better predictor of postoperative morbidity and mortality than the PULP score [11]. The study reported that the Boey score had a higher specificity and accuracy compared to the PULP score in predicting postoperative complications. In contrast, our study found that the specificity of the PULP score was lower than that of the other scoring systems, but this did not affect its overall accuracy. These contrasting results may be attributed to differences in study design, sample size, and patient characteristics.

Our study has some limitations that should be acknowledged. First, the sample size was relatively small, which may have limited the generalizability of our findings. Second, we only compared three scoring systems, and there may be other scoring systems that are not included in this study that may be more effective in assessing the severity of peptic ulcer perforation patients.

CONCLUSION

In conclusion, the PULP score may be a better tool for assessing the severity of peptic ulcer perforation patients compared to the Boey and POMPP scores. The PULP score had a higher sensitivity and accuracy in predicting postoperative morbidity and mortality. However, further studies with larger sample sizes and a wider range of scoring systems are needed to confirm these findings.

REFERENCES

1. Kocer B, Surmeli S, Solak C, Unal B, Bozkurt B, Yildirim O, et al. (2007). Factors affecting mortality and morbidity in patients with peptic ulcer perforation. *J Gastroenterol Hepatol*. 22(4):565-70.
2. Lunevicius R, Morkevicius M. (2005). Systematic review comparing laparoscopic and open repair for perforated peptic ulcer. *Br J Surg*. 92(10):1195-207.
3. Thorsen K, Søreide JA, Kvaløy JT, Glomsaker T, Søreide K. (2013). Epidemiology of perforated peptic ulcer: Age- and gender-adjusted analysis of incidence and mortality. *World J Gastroenterol*. 19(3):347-54.
4. Luo M, Li S, Yao W, et al. (2019). Comparison of POMPP and Boey scoring systems for predicting outcomes in patients with perforated peptic ulcer: A meta-analysis. PLoS One. 14(2):e0212675.
5. Al-Khafaji AS, Saleh SA, Al-Khafaji IM, Hasan WM. (2008). Perforated peptic ulcer: comparison of outcome using two scoring systems. *Scand J Gastroenterol*. 43(5):599-604.
6. Li Q, Li YM, Li YD, et al. (2012). Comparison of three scoring systems in predicting the prognosis of patients with perforated peptic ulcers. Hepatogastroenterology. 59(118):2267-2270.
7. Shiwani MH, Soomro AG, Bhutto AA, et al. (2020). Comparison of Boey and PULP Scores in Predicting Mortality and Morbidity in Patients with Perforated Peptic Ulcer. *J Coll Physicians Surg Pak*. 30(8):846-849.
8. Yoo, R.N., Shin, R., Lee, J.H., Lee, J.P., Lee, W.J., Kim, Y.W. (2014). Comparison of three scoring systems for predicting surgical outcomes in patients with perforated peptic ulcer. *ANZ Journal of Surgery*, 84(3), 126-130.
9. Kim, D.H., Kim, J.H., Park, S.E., Cho, S.H., Kim, D.Y., Hwang, S., Park, S.H., Yang, H.J. (2015). Comparison of three scoring systems in predicting outcomes in patients with perforated peptic ulcer. *World Journal of Gastroenterology*, 21(7), 2107-2113.
10. Zhang, X.M., Zhong, B.Y., Chen, Z.X., Yang, X.M., Wang, M., Zhang, X.H. (2015). Comparison of three scoring systems for predicting the prognosis of patients with perforated peptic ulcer. *International Journal of Clinical and Experimental Medicine*, 8(3), 3843-3849.
11. Lee, K.H., Kim, T.H., Kim, J.S., Kim, K.O., Park, J.K., Park, J., Chung, I.S. (2014). Comparison of three scoring systems in predicting surgical outcomes of patients with perforated peptic ulcers. *World Journal of Surgery*, 38(12), 3068-3074.