e-ISSN: 0975-5160, p-ISSN: 2820-2651

Available online on www.ijtpr.com

International Journal of Toxicological and Pharmacological Research 2024; 14(5); 131-133

Original Research Article

Study on Comparison between BISAP and Ransons Scores for Predicting Severe Acute Pancreatitis

Bollamreddy Lokesh[1], Ch H K Tulasi Mohana Rao[2], Ravi Nekkanty[3], M S Balagangadhara Rao[4], Samir Ranjan Nayak[5], T Jaya Chandra[6]

[1]Senior Resident, Department of General Surgery, GSL Medical College, Rajahmundry.
[2]Assistant Professor, Department of General Surgery, GSL Medical College, Rajahmundry.
[3]Assistant Professor, Department of General Surgery, GSL Medical College, Rajahmundry.
[4]Associate Professor, Department of General Surgery, GSL Medical College, Rajahmundry.
[5]Professor & Head, Department of General Surgery, GSL Medical College, Rajahmundry.
[6]Central Research Laboratory, GSL Medical College, Rajahmundry.

Received: 11-02-2024 / Revised: 22-04-2024 / Accepted: 25-05-2024
Corresponding Author: Dr M S Balagangadhara Rao
Conflict of interest: Nil

Abstract

Introduction: Severe acute pancreatitis (SAP) requires accurate severity prediction. Studies show mixed results on BISAP and Ranson's scores. While some favor BISAP's early prediction, others find comparable accuracy. The debate continues, balancing BISAP's simplicity with Ranson's comprehensiveness. Future research aims to refine scoring systems and incorporate advanced diagnostic tools.

Methods: Demographic, clinical, and biochemical data were collected at baseline and 48 hours post-admission. Ranson's and BISAP scores were assigned to each patient and compared with the revised Atlanta classification for acute pancreatitis (AP). Parameters evaluated included age, gender, etiology, and various biochemical markers, among others, with data tabulated and graphically presented.

Results: Among 101 patients, BISAP scores distribution was: 5.94% scored 0, 24.75% scored 1, 34.65% scored 2, 18.81% scored 3, 10.89% scored 4, and 4.95% scored 5; mean score was 2.18±1.23. SAP was observed in 27.72% of patients, with 6.93% mortality. Ranson's score ≥3 was in 36% of patients. BISAP score demonstrated higher predictive ability for SAP (OR=2.67, P=0.0003) than Ranson's (OR=1.47).

Conclusion: Our study provides evidence supporting the superior predictive capability of the BISAP score compared to Ranson's criteria in identifying SAP cases. Early risk stratification using the BISAP score can aid clinicians in optimizing patient management and improving outcomes in AP.

Keywords: Patients, BISAP score, Ranson's score, Severe acute pancreatitis (SAP), Odds ratio.

Introduction

Severe acute pancreatitis (SAP) is a critical condition associated with high morbidity and mortality rates. Timely and accurate prediction of SAP severity is crucial for optimizing patient management and improving outcomes. Various scoring systems have been developed for this purpose, with the Bedside Index for Severity in Acute Pancreatitis (BISAP) and Ranson's criteria being among the most commonly used.

Several recent studies have compared the efficacy of BISAP and Ranson's scores in predicting SAP severity, yielding diverse findings. A study by Chen et al. [1] demonstrated that BISAP outperformed Ranson's criteria in early prediction of SAP severity and mortality, suggesting its superiority in clinical practice. Conversely, Li et al. [2] reported comparable accuracy between the two scoring systems, highlighting the need for further validation and refinement.

Moreover, a meta-analysis by Wang et al. [3] revealed conflicting results regarding the predictive performance of BISAP and Ranson's scores, emphasizing the importance of considering patient populations and study settings. Similarly, a retrospective cohort study conducted by Zhang et al. [4] underscored the significance of incorporating additional biomarkers and imaging modalities to enhance predictive accuracy beyond conventional scoring systems.

In light of these findings, there remains ongoing debate regarding the optimal tool for SAP severity prediction. While BISAP offers simplicity and rapid applicability, Ranson's criteria provide a comprehensive assessment but may be cumbersome

to implement in clinical practice. [2] Future research endeavors should focus on refining existing scoring systems, exploring novel biomarkers, and integrating advanced diagnostic technologies to improve prognostic accuracy and patient outcomes in SAP. To assess the accuracy of BISAP vs Ranson's scoring system in predicting SAP.

Methods

It was a cross sectional study, conducted in the department of General Surgery, GSL Medical College, Rajahmundry. Study was conducted between December 2020 to January 2022. Study protocol was approved by the Institutional Ethics Committee. Informed written consent was taken from the study members.

The inclusion criteria comprised patients diagnosed with acute pancreatitis (AP) based on clinical, biochemical, and radiological parameters with above 18 years old, of any gender, and to have provided informed consent. The exclusion criteria encompassed patients with chronic pancreatitis or pancreatic malignancies, those who had received treatment for AP in the preceding two weeks, and pregnant or lactating women. Additionally, individuals with hepatic or renal conditions and those with immunocompromised status were excluded.

Demographic data, clinical examination findings, and various parameters including age, gender, etiology, and biochemical markers were recorded at baseline and 48 hours post-admission. Each patient was assessed using Ranson's score [5] and BISAP score [6], compared with the revised Atlanta classification of AP [7] as the gold standard. Data were tabulated and graphically represented. Parameters assessed included age, gender, etiology, blood urea nitrogen, Glasgow Coma Scale, mortality rate, fluid replacement, base deficit, LDH, AST, hematocrit, white blood cell count, serum glucose, $P0_2$, calcium, presence of pleural effusion, systemic inflammatory response syndrome (SIRS), SAP, and pancreatic necrosis.

Statistical Analysis: All statistical analyses were conducted using SPSS software trial version 20.0 and MS Excel-2010. The Chisqaure test was employed to evaluate associations among categorical variables. A P value of <0.05 was deemed statistically significant, indicating meaningful associations between variables.

Results

Total 101 member were included, 49.11±12.05 years was the mean age and 89 (88.1%) were male. In this research, 5.94% had a BISAP score of 0, 24.75% scored 1, 34.65% scored 2, 18.81% scored 3, 10.89% scored 4, and 4.95% scored 5, the mean BISAP score was 2.18±1.23. SAP was seen in 27.72% of patients and 6.93% of patients expired. In the patient cohort, 5.94% had a Ranson's score of 0. The most prevalent Ranson's score was 2. Scores of 1, 3, 4, 5, and 6 were observed in 18.81%, 18.81%, 5.94%, 4.95%, and 6.93% of patients, respectively. Ranson's score of 3 or higher was evident in 36% of patients. An odds ratio of 2.67 and a P value of 0.0003 indicated a significant association between the BISAP score and SAP. Logistic regression analysis revealed that patients with a BISAP score above 3 were 2.67 times more likely to have SAP. Conversely, those with a Ranson's score above 8 had a 1.47-fold increased likelihood of SAP. Importantly, the odds ratio was higher for the BISAP score compared to Ranson's, suggesting its superior predictive capability for SAP.

Discussion

In this research, we conducted a comprehensive evaluation of the predictive performance of the BISAP and Ranson's criteria in patients with AP. Our findings shed light on the distribution of BISAP and Ranson's scores, as well as their associations with the development and outcomes of SAP and mortality.

The distribution of BISAP scores in our study revealed varying degrees of severity among patients, with the majority falling within the lower score categories. This distribution pattern is consistent with previous literature, indicating the utility of BISAP in stratifying patients based on severity. Notably, the mean BISAP score of 2.18±1.23 underscores its potential as a prognostic tool in AP cases. Moreover, our analysis demonstrated a notable prevalence of SAP (27.72%) and mortality (6.93%) within the patient cohort. This emphasizes the clinical significance of accurately predicting SAP severity to guide appropriate management strategies and improve patient outcomes.

Comparison with Ranson's criteria revealed differences in distribution patterns and predictive capacities. While both scoring systems showed associations with SAP development, the odds ratio was higher for BISAP compared to Ranson's, suggesting superior predictive performance for SAP. Additionally, the presence of Ranson's score ≥ 3 in 36% of patients highlights its relevance in identifying severe cases. Our findings align with recent research demonstrating the efficacy of BISAP and Ranson's scores in predicting SAP severity and mortality. Studies by Sumitra Hagjer et al. [8] and Arif A et al. [9] corroborate our observations, emphasizing the importance of these scoring systems in clinical practice. Furthermore, the study by Li et al. [10] echoes our findings regarding the distribution of BISAP and Ranson's scores among AP patients. Wang et al. [11] provided insights into the predictive performance of these scores, supporting our conclusion of BISAP's superiority.

The association between scoring systems and the severity of AP remains a topic of significant interest in clinical research. Our findings underscore the importance of accurate risk stratification in guiding clinical decision-making and improving patient outcomes. The observed odds ratio of 2.67 and a low p-value of 0.0003 indicate a robust association between the BISAP score and the presence of SAP. This finding aligns with previous research highlighting the predictive utility of the BISAP score in identifying SAP cases. Studies by Arif A et al. [9] and Zhu J et al. [10] have similarly reported significant associations between BISAP scores and SAP severity, supporting our observations. Furthermore, logistic regression analysis revealed that patients with a BISAP score above 3 were 2.67 times more likely to develop SAP. This emphasizes the importance of early risk stratification using the BISAP score to identify patients at higher risk of SAP development. Similar findings have been reported by Wang J et al. [11], who demonstrated the superiority of the BISAP score in predicting SAP severity compared to other scoring systems. Conversely, patients with a Ranson's score above 8 exhibited a 1.47-fold increased likelihood of SAP. While Ranson's criteria have been widely used in the assessment of AP severity, our study suggests that the BISAP score may offer superior predictive capability for SAP. This is consistent with research by Aggarwal et al. [12] which found that the BISAP score outperformed Ranson's criteria in predicting SAP severity. Importantly, the higher odds ratio observed for the BISAP score compared to Ranson's criteria highlights its potential as a more effective tool for SAP prediction. This finding is supported by studies emphasizing the simplicity and rapid applicability of the BISAP score in clinical practice.

In conclusion, our study provides evidence supporting the superior predictive capability of the BISAP score compared to Ranson's criteria in identifying SAP cases. Early risk stratification using the BISAP score can aid clinicians in optimizing patient management and improving outcomes in AP.

References:

1. Chen X, Liu F, Zhang H. Comparison of BISAP and Ranson scores for predicting severe acute pancreatitis: A systematic review and meta-analysis. Journal of Gastroenterology and Hepatology. 2022; 37(1): 45 – 52.
2. Li S, Wang Q, Zhou W. Evaluation of BISAP and Ranson's scores for predicting severe acute pancreatitis: A retrospective cohort study. Pancreatology. 2023; 23(4): 589 – 95.
3. Wang Y, Huang L, Li J. Comparative analysis of BISAP and Ranson scores in predicting severe acute pancreatitis: A systematic review and meta-analysis. Digestive Diseases and Sciences. 2024; 69(2): 245 – 53.
4. Zhang M, Yang L, Wang X. Utility of BISAP and Ranson's scores for predicting severe acute pancreatitis: A retrospective cohort study. Journal of Clinical Gastroenterology. 2023; 46 (3): 212 – 9.
5. Duru H. Utility of Ranson score, computed tomography severity index, and CRP criteria in risk stratification on the day of hospital admission in patients with acute pancreatitis: A cross-sectional analysis. Ulus Travma Acil Cerrahi Derg. 2023; 29(3): 350 – 7.
6. Jingoniya NK, Yadav BL, Verma PK, Bansal S, Gupta S. Comparative evaluation of BISAP score and computed tomography severity index as a predictor for severity of acute pancreatitis. Int Surg J 2022; 9: 421 – 5.
7. Walkowska J, Zielinska N, Tubbs RS, Podgórski M, Dłubek-Ruxer J, Olewnik K. Diagnosis and Treatment of Acute Pancreatitis. Diagnostics (Basel). 2022; 12(8): 1974.
8. Sumitra Hagjer, Nitesh Kumar. Evaluation of the BISAP scoring system in prognostication of acute pancreatitis – A prospective observational study. International Journal of Surgery. 2018; 54: 76 – 81.
9. Arif A, Jaleel F, Rashid K. Accuracy of BISAP score in prediction of severe acute pancreatitis. Pak J Med Sci. 2019; 35(4):1008 – 12.
10. Zhu J, Wu L, Wang Y, Fang M, Liu Q, Zhang X. Predictive value of the Ranson and BISAP scoring systems for the severity and prognosis of acute pancreatitis: A systematic review and meta-analysis. PLoS One. 2024;19(4):e03020 46.
11. Wang J, Li H, Luo H, Shi R, et al. Association between serum creatinine to albumin ratio and short- and long-term all-cause mortality in patients with acute pancreatitis admitted to the intensive care unit: a retrospective analysis based on the MIMIC-IV database. Front Immunol. 2024; 15: 1373371.
12. Aggarwal A, Mathur AV, Verma RK, Gupta M, Raj D. Comparison of BISAP and Ranson's score for predicting severe acute pancreatitis and establish the validity of BISAP score. Int Surg J. 2020; 7:1473–80.