

## Research article

**A comparative study between BISAP and Ranson's score in predicting severity of acute pancreatitis**

Gokul C. M., Anand Ignatius Peter

Department of General Surgery, A J Institute of Medical Sciences, Kuntikana, Mangalore, 575 004, Karnataka, India

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Corresponding author: **Gokul C. M.** Email: gokulcm16@gmail.com**ABSTRACT**

**Introduction and Aim:** Acute pancreatitis has variable clinical and systemic indications checking the range from a mild illness to serious, hazardous, multiorgan dysfunction. Among different scoring systems used to assess seriousness in acute pancreatitis, BISAP (Bed side index for severity of acute pancreatitis) and Ranson scoring frameworks have been viewed as predictive and impressively utilized. This study targets surveying the predictive role of BISAP scoring in contrast with Ranson's score for severity of acute pancreatitis.

**Materials and Methods:** All patients with acute pancreatitis will be assessed and their full medical history, complete clinical examination, biochemical studies, will be gathered. Prediction of severity by BISAP and Ranson as compared to severity using Revised Atlanta classification was done using kappa coefficient, specificity, positive predictive value, negative predictive value and accuracy.

**Results:** In this study out of 150 patients in the study population, most were in the age group between 25 to 45, with male predominance. 137 (89.3%) mild and 16 (10.7%) severe coarse are found in our study. Sensitivity (100 %), specificity (57.4 % vs 56.7), positive predictive value (21.9 vs 21.62%) and negative predictive value (100%) were found when BISAP was compared to Ranson's in our study.

**Conclusion:** In this study, we can come to a conclusion that BISAP is similarly effective in predicting the severity of acute pancreatitis as Ranson's scoring system. BISAP is simple to use, modest, easy to calculate and it does not need 48 hours for completion when compared to Ranson's. Consequently, BISAP can be performed on bedside of patients with acute pancreatitis in any setup.

**Keywords:** Acute pancreatitis; BISAP; Ranson; revised Atlanta classification.

**INTRODUCTION**

Acute pancreatitis is characterized by peripancreatic inflammation and multi-organ involvement that results in multi-organ dysfunction syndrome (MODS) and a higher death rate (1). The pathologic process may lead to an acute version of the disease that resolves on its own or to a catastrophic auto-digestion activity that involves distant organ systems or other regional tissues and can be extremely harmful. The word pancreatitis was coined in response to clinical evidence of pancreas-related abdominal discomfort that was significantly elevated in serum lipase and amylase (2). Mild pancreatitis is defined by the updated Atlanta classification (3) of acute pancreatitis as having little organ dysfunction and a smooth recovery. Acute pseudocyst, pancreatic necrosis, or pancreatic abscess are examples of local consequences that can occur from severe pancreatitis, along with the possibility of organ failure (4). The aim of this study was to determine the validity of a simple yet precise clinical scoring system for classifying patients based on their risk of in-hospital mortality by comparing the Bedside Index for Severity in Acute Pancreatitis (BISAP) and Ranson's score (5). The current study compared the predictive value of BISAP with Ranson's score for severe acute pancreatitis, with the goal of validating the BISAP scoring system.

**MATERIALS AND METHODS****Study subjects**

This prospective study was carried out from October 2020 to August 2022 in the general surgery department of the A. J. Institute of Medical Sciences in Mangalore. After gaining informed consent, 150 patients with symptoms suggestive of acute pancreatitis were admitted.

**Sampling technique**

The 150 participants in this study were classified as having mild and severe pancreatitis using the revised Atlanta criteria and scoring system. Statistical analysis of the data was performed using SPSS 20.0. The categorical variables were presented as frequency and percentage. The continuous variables were presented as mean  $\pm$  SD. Prediction of severity by BISAP and Ranson as compared to severity using revised Atlanta classification of acute pancreatitis was done using kappa coefficient. The data were analysed using descriptive statistics and Chi-square test is used to test the significant difference of BISAP and Ranson's score in predicting severity of acute pancreatitis.

**RESULTS**

A total of 150 patients were taken as study population. The age group of patients enrolled in the study ranges

from 19 to 65 years with an average age of  $38.57 \pm 10.72$  years. The peak incidence of the disease was noted in the 3<sup>rd</sup> (49/32.7%) and 4<sup>th</sup> decade (49/32.7%) of life (Table 1).

**Table 1:** Age distribution of the study population

Age range (years)	Number of patients	Percent (%)
18-25	10	6.7
25-34	49	32.7
35-44	49	32.7
45-54	26	17.3
$\geq 55$	16	10.7
Total	150	100.0

History of alcohol consumption and possibility of it being the etiological factor were found in 113(75%) patients, gallstone disease was attributed in 11(7.3%) patients. No cause could be attributed in the rest 26(17.3%; Table 2).

**Table 2:** Classification of patients based on etiology

Etiology	Frequency	Percent
Alcohol induced pancreatitis	113	75.3
Gall stone induced pancreatitis	11	7.3
Idiopathic	26	17.3
Total	150	100.0

All the patients included in our study were classified according to BISAP and Ranson's scoring into mild ( $<3$ ) and severe ( $\geq 3$ ) acute pancreatitis (Table-3). The table depicts severity of acute pancreatitis, among the 150 patients, 77(51.3%) had mild acute pancreatitis and 73(48.7%) had severe acute pancreatitis according to BISAP score. Severity based on the Ranson's score shows 76(50.7%) had mild and 74(49.3%) had severe acute pancreatitis (Table 3). According to the revised Atlanta classification system 134(89.3%) had mild acute pancreatitis and 16 (10.7%) had severe acute pancreatitis (Table 4).

**Table 3:** Classification of patients on the basis of BISAP and Ranson's score

Age in years	BISAP Score			Ranson's Score		
	Mild n (%)	Severe n (%)	Total (n%)	Mild n (%)	Severe n (%)	Total (n%)
18-25	4(5.2%)	6(8.2%)	4(5.3%)	6(8.1%)	10(6.7%)	10(6.7%)
25-34	29(37.7%)	20(27.4%)	28(36.8%)	21(28.4%)	49(32.7%)	49(32.7%)
35-44	24(31.2%)	25(34.2%)	26(34.2%)	23(31.1%)	49(32.7%)	49(32.7%)
45-54	12(15.6%)	14(19.2%)	12(15.8%)	14(18.9%)	26(17.3%)	26(17.3%)
$\geq 55$	8(10.4%)	8(11.0%)	6(7.9%)	10(13.5%)	16(10.7%)	16(10.7%)
Total	77(100.0%)	73(100.0%)	76(100.0%)	74(100.0%)	150(100.0%)	150(100.0%)

**Table 4:** Severity of acute pancreatitis on the basis of Revised Atlanta classification

Severity	Number of patients	Percent
Mild acute pancreatitis	134	89.3
Severe acute pancreatitis	16	10.7
Total	150	100.0

**Table 5:** Comparison of severity based revised Atlanta classification of acute pancreatitis compared with BISAP and Ranson's score respectively

Score	Type	Revised Atlanta classification		Total
		SAP	MAP	
Ranson's	SAP	16	58	74
	MAP	0	76	76
	Total	16	134	150
BISAP	SAP	16	57	73
	MAP	0	77	77
	Total	16	134	150

SAP-Severe Acute Pancreatitis, MAP-Mild Acute Pancreatitis

**Table 6:** Comparison of Ranson's and BISAP scoring system

Scoring System	Sensitivity	Specificity	PPV	NPV	Accuracy
BISAP Score	100%	57.4%	21.9%	100%	62%
Ranson's Score	100%	56%	21%	100%	61.2%

As shown in Table 5, there were 16 cases which were suggested to have SAP by both the scoring systems and 76 cases were predicted to be MAP by both the systems. Fifty-eight cases were classified as SAP by Ranson but MAP by the gold standard system revised Atlanta classification. All the cases classified as MAP by BISAP were found to be MAP by revised Atlanta classification system. Table 6 shows the accuracy rate in BISAP (62%) and is more than Ranson's (61.2%).

## **DISCUSSION**

Acute pancreatitis is a frequent gastrointestinal ailment that poses a significant surgical challenge to general surgeons around the globe (6-8). It is a complicated process that can range from a moderate, self-limiting inflammation to a quickly worsening illness that might be fatal. Effective treatment therapies can be instituted at the right moment to enhance outcomes if individuals with acute pancreatitis who are at risk of experiencing a severe episode are identified and stratified early. When it comes to clinical treatment and research, the BISAP score is a reliable and accurate way to categorize individuals with acute pancreatitis (9,10). This study aimed to evaluate the predictive accuracy of BISAP versus Ranson's in assessing acute pancreatitis severity and subsequently compare their respective efficacies (11-13). Of the 150 cases in the study, 134 (89.9%) had mild pancreatitis. In most cases, the illness resolves on its own. Severe pancreatitis was present in 16 cases (10.7%), which was more than the 11.9% reported in other studies.

The 16 SAP cases that were classified using the revised Atlanta criteria were all identified by the BISAP and Ranson's scoring systems, giving them both a good 100% sensitivity. However, it was discovered that the courses of 57 out of 73 and 58 out of 74 cases, respectively, that the BISAP and RANSON scoring systems had designated as SAP, had been uneventful. In our analysis, 97 cases (64.7%) out of 150 had no organ failure, 7 cases (4.7%) had ARDS, 7 cases (4.7%) had MODS, and 2 cases (1.3%) had renal failure. Pseudocyst was a local complication in 37 patients (24.7%) of the patients who did not have organ failure. This is comparable to the findings of research conducted by Singh *et al.*, (5). With a RANSON score of greater than three and BISAP membership, all of these patients were diagnosed with severe acute pancreatitis. In our study, there were six deaths overall (4%).

In the current study, no age group was found to be immune to pancreatitis; however, people in their relatively middle age are more likely to be affected. The third and fourth decade of life, with 49 patients (32.7%) each, were the most frequently affected age groups of patients. With 139 cases (92%) vs 11 cases

(7.3%), males were more frequently affected than females (14:1). This is likely because men in this region tend to consume more alcohol than women do. In 113 patients (75%) the most common etiological factor was found to be alcohol consumption, followed by gallstones in 11 patients (7.3%) and patients whose cause was unknown in 26 patients (17%). The incidence of severe pancreatitis in this study was 16(10.7%) higher than reported elsewhere (14,15).

Sensitivity, specificity, positive predictive value, negative predictive value and accuracy were (100%), (56% vs 57.4%), (21% vs 21.9), (100%), (61.3%vs62%) respectively for both Ranson's score and BISAP scoring systems. Sensitivity was found to be 100% and specificity even though it was lesser than 57.4% it was found to be better than that of Ranson's 56% with slightly better accuracy (62% vs 61.2%). BISAP score cannot be used to predict prognosis of the patient after 48 hours when compared to Ranson's which necessitates the need of extended BISAP score to classify patients after 48 hours (16-18). Thus, it is demonstrated in this study that the BISAP score and Ranson's score are equally useful in predicting the severity in patients with acute pancreatitis (19-21). Furthermore, in contrast to Ranson's score, its components are readily available and its assessment process doesn't take 48 hours (22-25).

## **CONCLUSION**

In order to quickly stratify the severity of acute pancreatitis and begin appropriate treatment, every surgeon should first think about utilizing the BISAP score. This will help to prevent the mortality that is linked to severe acute pancreatitis.

## **CONFLICT OF INTEREST**

The authors declare no conflicts of interest.

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