

Predicting Severity of Pancreatitis and Its Mortality-Comparison of BISAP and Ranson Scoring Systems

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ABSTRACT

Objective To find out the prognostic significance of BISAP scoring system and its accuracy in predicting the severity of acute pancreatitis in comparison with Ranson criteria.

Study design Cross-sectional study.

Place & Duration of study Department of General Surgery ward 26 Jinnah Postgraduate Medical Centre (JPMC) Karachi, from January 2013 to December 2014.

Methodology Patients of either gender more the 14 year of age with acute pancreatitis admitted through emergency department were included. All the patients were scored according to the Ranson criteria (at time of admission and at first 48 hours post admission) and BISAP score (in first 24 hours of admission). Patients were categorized having mild or severe acute pancreatitis on the basis of organ failure for more than 48 hours and these patients were treated in HDU/ICU according to the standard protocol.

Results A total of 50 patients diagnosed as acute pancreatitis were admitted during the study period. The mean age of the patients was 43.48 ± 15.75 year with the age range from 15 year to 75 year. There were 30 (60%) females and 20 (40%) males with F:M ratio of 1.5: 1. The duration of hospital stay was 2-50 days with mean of 12.15 ± 5.85 days. Nine (18%) patients developed persistent organ failure for more than 48 hours and were classified as having severe acute pancreatitis. These patients underwent contrast CT- scan abdomen on day 3 of admission. Three of them had necrotizing pancreatitis. The frequency of severe form of acute pancreatitis stratified by the BISAP and Ranson score were both statistically significant ($p < 0.001$). Three (6%) patients died during their hospital stay (mortality rate 6%). All the three patients who died had Ranson score > 3 and BISAP score = 3 respectively.

Conclusion In predicting the frequency of severity and mortality in patients with acute pancreatitis the BISAP scoring system is equally effective as Ranson scoring system.

Key words Acute pancreatitis , Severe acute pancreatitis, Pancreatic necrosis, BISAP score, Ranson score.

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INTRODUCTION:

Acute pancreatitis is the major surgical challenge to all the general surgeons worldwide.¹ Acute pancreatitis has a broad clinical spectrum that varies from mild illness to multi-organ failure and death.² Its incidence varies from 50-80 cases per 100,000 in United State of America.³ On the other hand its frequency is reported as 2.29 % in Indian subcontinent.⁴

According to the Atlanta classification, the acute pancreatitis can be classified as mild or severe depending on local and the systemic complications.⁵ Majority of the cases of acute pancreatitis are mild in nature but 10-20% patients may experience severe attack with the mortality rate of 20%.^{3,6} Hence the accurate prediction of severity of attack is important for the improvement of the survival rate. To predict the severity of the attack and prognosis of the acute pancreatitis there are number of diagnostic criteria that help in categorizing the patients on the basis of the severity of attack and also in guiding the management. An ideal predicting scoring system should be simple, non-invasive, accurate, qualitative, with easily available cost effective assessment tests.

There are number of scoring systems employed to assess the severity of acute pancreatitis amongst them the most commonly used systems are Ranson, Glasgow, APACHE II.^{7,8} Ranson scoring system is the most commonly used. For this data has to be collected at the time of admission which is usually missed and it takes 48 hours for completion, the same is true for the Glasgow system.⁹ The Ranson score was originally designed to assess severity of alcohol induced acute pancreatitis.¹⁰ Later when gallstones were found to be the cause pancreatitis this scoring system was revised in 1979 as Revised Ranson score.¹¹ The cutoff value accepted in literature is 3.¹² The Ranson system is a very good predictor at the extremes of scores (<3 predicts survival, >6 predicts death) but it is not accurate at intermediate scores.¹³

A new scoring system, the BISAP (Bedside Index for the Severity in Acute appendicitis) helps to identify the patient at risk of mortality prior to the development of multi-organ failure.^{11,14} BISAP scoring system is relatively simple and quick way to assess the severity of acute pancreatitis on admission and helps improving the management of the patient. The purpose of this study was to find out the prognostic significance of BISAP scoring system

and its accuracy in predicting the severity of disease in comparison with Ranson score.

METHODOLOGY:

This cross-sectional study was carried out in the Department of General Surgery ward 26 Jinnah Postgraduate Medical Centre Karachi, from January 2013 to December 2014. A total of fifty patients were enrolled. All were admitted through the emergency department. Patients with known co-morbidities (renal, cardiovascular, respiratory, neurological) were excluded. Detailed history was taken and clinical examination done. Investigations requested included leukocyte count, blood sugar. ALT, LDH, hematocrit count, blood urea nitrogen, serum calcium, and ABG'S. Chest x-ray was done in all the patients while contrast CT scan abdomen only in those patients where indicated. All the patients were scored according to the Ranson criteria and BISAP score (first 24 hours of admission). Patients were categorized having mild or severe acute pancreatitis on the basis of organ failure for more than 48 hours and these patients were treated in HDU/ICU according to the standard protocol. The data was entered and statistically analysed using SPSS version 10. Chi-square test and Fisher's Exact test were applied where indicated and p-value <0.05 was considered as statistically significant.

RESULTS:

A total of 50 patients diagnosed as acute pancreatitis were admitted. Mean age of the admitted patients was 43.48 ± 15.75 year. Age ranged from 15 year to 75 year. There were 20 males and 30 female patients. The mean hospital stay was 12.15 ± 5.85 days (range 2-50 days). Nine (18%) patients developed multi-organ dysfunction syndrome. These were categorized as having severe acute pancreatitis. In these patients CT- scan abdomen was done on 3rd day of admission. Necrotic pancreas was found in three (6%) patients.

The number of patients and their proportions of

Table I: Number of Patients, Proportion of Variables and Mortality Stratified By BISAP Scoring System

BISAP Score	No. of Patients (n)	MAP	SAP	Pancreatic Necrosis	Sepsis	Mortality
0	21	21	-	-	-	-
1	17	17	-	-	-	-
2	5	3	2	-	-	-
3	7	-	7	2	1	6%
4	-	-	-	-	-	-
5	-	-	-	-	-	-

variable and mortality stratified by BISAP score is given in table I. The frequency of severe form of acute pancreatitis stratified by the BISAP and Ranson score were both statistically significant ($p < 0.001$). Three patients died during their hospital stay with the mortality rate of 6%. In patients who died the Ranson score was > 3 and BISAP score = 3 respectively.

DISCUSSION:

A number of scoring systems have been developed to predict the severity of acute pancreatitis with the aim to identify early the patients at increased risk of complications and mortality.¹³ Our study reported female predominance which was also reported in other series.^{15,16} This disease affects all the age groups but the most commonly found in the middle aged population as noted in index study. This was also supported other reported studies.^{13,17} The patients presented with varying clinical symptoms ranging from mild epigastric pain with complete recovery to multi-organ failure. It is thus important to diagnose a patient with severe disease at admission.^{18,19} The frequency of severe pancreatitis in our study was 18%. This is lower than another study where its frequency was 31%.²

The key determinant of the outcome was the presence or absence of local complications (pancreatic necrosis, pancreatic abscess) and systemic complications (sepsis, multi-organ failure). In our study the frequency of pancreatic necrosis was 6% which was slightly higher than another study.²⁰ The pancreatic necrosis associated with the disease severity increases the mortality rate. In our study three patients had pancreatic necrosis out of which two died. This pattern is also reported in another study.¹³ All patients who died had Ranson score > 3 and BISAP score = 3. A higher mortality rate of 12.05% was observed in a study conducted in China.²¹

CONCLUSIONS:

BISAP scoring system is equally effective as Ranson scoring system in predicting mortality in patients with acute pancreatitis. The BISAP scoring system is quick and easy to perform at the bed side.

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Author's Contributions:

Shireen A.A Ramzanali Damani: Analyzed, edited, reviewed the data.

Zia-Ul-Islam: Analysed final data.

Khalid Rasheed: Supervised data collection.

Afshan Hashami: Data collection.

Conflict of Interest:

The authors declare that they have no conflict of interest.

Source of Funding:

None

How to cite this article:

Damani SAAR, Islam Z, Rasheed K, Hashami A, Shah SSH. Predicting Severity of pancreatitis and mortality- comparison of BISAP and Ranson scoring systems. *J Surg Pakistan*. 2016;21(1): 9-12. Doi:<http://dx.doi.org/10.21699/jsp.21.1.3>