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Original Research

To compare the predictability between BISAP scoring and Ranson's scoring system in predicting organ failure and necrosis in acute pancreatitis

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ABSTRACT:
Background- Acute pancreatitis is defined as a pancreatic inflammatory process, with peri-pancreatic and multi-organ involvement causing multi- organ dysfunction syndrome (MODS), with increased mortality rate. **Material and methods-** The study includes 60 patients with acute pancreatitis. The two different scoring systems (BISAP and RANSON'S) were compared and analyzed in patients with acute pancreatitis. **Results-** BISAP score has proved to be a powerful tool in predicting the severity of acute pancreatitis in par with Ranson's score. **Conclusion-** BISAP scoring system is equally efficacious as Ranson's scoring system in predicting the severity of acute pancreatitis.
Key words: BISAP scoring, Organ failure, Ranson's scoring.

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INTRODUCTION

In 1925, Sir Berkeley Moynihan "Acute pancreatitis is the most terrible of all the calamities occurring in conjunction with the abdominal viscera," .[1,2] Acute pancreatitis is a reversible pancreatic parenchymal injury associated with inflammation.[3] There are many causes of acute pancreatitis, gallstones being the most common one. Alcohol abuse is the second most common. Acute pancreatitis (AP) diagnostic criteria and outcome prediction were the subject of discussions over the years, but the Atlanta Symposium in 1992 set the standards relating diagnostic criteria and disease severity. [4] So to predict the severity of acute pancreatitis and, as important, for patient stratification and enrolment in clinical trials. These include the clinical scoring scales as Ranson's criteria, Glasgow scales, simplified acute physiology (SAP) score and acute physiology and chronic health evaluation II (APACHE II) score, BISAP score and MCTSI criteria etc. Ranson's criteria is the most commonly used scoring system and is based on 11 clinical and laboratory parameters measured within the first 48 hours of admission to the hospital[3]. So the aim of present study was to compare the predictability between BISAP scoring and Ranson's Scoring system in predicting organ failure and necrosis.

MATERIALS AND METHODS

Our present study was prospective randomized study and it included all confirmed cases of acute pancreatitis admitted in Rajindra Hospital Patiala during the study period. Patients with chronic pancreatitis or recurrent pancreatitis, those undergone previous surgery for any pancreatic pathology, old treated cases of acute pancreatitis, Sequelae of Acute Pancreatitis, Patients not

willing for informed consent were excluded from the study. 60 Confirmed cases of acute pancreatits based on 2 or more of the following were taken for study:

- Characteristic abdominal pain of acute pancreatitis.
- Serum amylase or lipase level 3 or more times the upper limit of normal.
- Thorough history taking and clinical examination, blood investigation of each patient was carried out per the prepared Performa.

X ray chest and abdomen, USG whole abdomen, Contrast Enhanced Computed Tomography of the whole abdomen were done.BISAP score and Ranson's score were calculated in all such patients based on data obtained within 24 hours of hospitalization and at 48 hours. Bedside index of severity in acute pancreatitis (BISAP) score

- BUN >25 mg/dl (8.9 mmol/L)
- Abnormal mental status with a Glasgow coma score<15.
- Evidence of SIRS (systemic inflammatory response syndrome).
- Patient age >60 years old.
- Imaging study reveals pleural effusion.

Systemic inflammatory response syndrome was defined as two or more of the following: temperature of <36°C or >38°C, PaCO2 <32 mmHg or respiratory rate >20 breaths/min, pulse >90 beats/min, and white blood cell count <4,000 or>12,000 cells/mm3 or >10% immature bands. Ranson's criteria for non-gallstone pancreatitis, the parameters are:

At admission the age > 55 years, WBC> 16000 cells/mm^3 , Blood glucose > 11 mmol/L (> 200 mg/dL) , Serum AST > 250 IU/, Serum LDH > 350 IU/L

Within 48 hours: Serum calcium < 2.0 mmol/L , Hematocrit fall > 10% , Oxygen (hypoxemia PaO2 < 60 mmHg) , BUN increased by 1.8 or more mmol/L (5 or more mg/dL) after IV fluid hydration, Base deficit (negative base excess) > 4 mEq/L , Sequestration of fluids > 6 L

For gallstone pancreatitis, the parameters are: At admission: Age (in years) > 70 years,White blood cell count > 18000 cells/mm3, Blood glucose > 12.2 mmol/L , Serum AST > 250 IU/L, Serum LDH > 400 IU/L.

Within 48 hours- Serum calcium < 2.0 mmol/L (< 8.0 mg/dL), Hematocrit fall > 10%, Oxygen hypoxemia (PaO2 < 60 mmHg), BUN increased by 0.7 or more mmol/L (2 or more mg/dL) after IV fluid hydration, Base deficit (negative base excess) > 5 mEq/L, Sequestration of fluids > 4 L

OBSERVATION AND RESULTS

- This study was conducted in Rajindra hospital, Patiala.
- Total number of patients studied were 60
- According to Altanta Revised criteria, 38 patients had mild pancreatitis, 19 patients had moderately severe pancreatitis, 3 patients had severe pancreatitis.
- Of the 60 patients, 37 patients had ranson's score less than or equal to 3. 23patients had a score of more than 3.
- Of the 60 patients, 39 patients had a BISAP score less than or equal to 3. 21 patients had a score more than 3.

No. of patients without complications	No. of patients with complications	Complications			
		Local Complications			Systemic Complications
		Pseudocyst	Pancreatic Necrosis	Haemorrhagic Pancreatitis	SIRS/ Organ Failure/MODS
38	22	12	4	0	6

Table 1 - Outcome of patients

Ranson's Score	Uncomplicated outcome	Local Complications			Systemic Complications
		Pseudocyst	Pancreatic Necrosis	Haemorrhagic Pancreatitis	Organ failure (Transient or Persistent organ failure)
< = 3	36	1	0	0	0
> 3	2	11	2	0	3
> 5	0	0	2	0	3

Table 2 - Outcome of patient based on different cut off Ranson's score

BISAP Score	Uncomplicated outcome	Local Complications			Systemic Complications
		Pseudocyst	Pancreatic Necrosis	Haemorrhagic Pancreatitis	MODS/Renal failure/ respiratory failure
< = 3	36	3	0	0	0
> 3	2	9	4	0	6

Table 3 -Outcome of patients based on different cut off BISAP Score

Ranson's Score	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	Accuracy
Pancreatic Necrosis	93.33	96	93.33	96	95
Major Organ Failure	100	64.1	6.66	100	65

Table 4 -Prediction of major organ failure and pancreatic Necrosis by Ranson's Score

Ranson's scores were very sensitive for prediction of systemic complications (100%) but less sensitive for prediction of local complications (93.33).

BISAP Score	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	Accuracy
Pancreatic Necrosis	93.33	96	93.33	96	95
Major Organ Failure	100	64.1	6.66	100	65

Table 5 - Prediction of major organ failure and pancreatic Necrosis by BISAP Score

BISAP score was more accurate prediction of systemic complications (100 %) but less sensitive for prediction of local complications (93.33).

DISCUSSION

Acute pancreatitis is a common disorder with wide spectrum of illness. Severe acute pancreatitis having high morbidity and mortality rate, multiple interventions have been tried to prevent this. In this study, the two different scoring systems (BISAP and RANSON'S) were compared and analyzed to assess the severity in patients with acute pancreatitis.

In our study out of 6 (10%) patients had systemic complication of pancreatitis in another study done by Sidra et al[5] 25 patients (31%), had systemic complication of pancreatitis, J. Lalith et al[6], had 14% patients systemic complication pancreatitis and Shireen et al[7], had 18% systemic complication . So our study results were comparable to the study done by J. Lalith et al[6]

In our study 4 out of 38 patients (10.52%) had pancreatic necrosis. Balthazar et al[8] encountered 20.4% of pancreatic necrotic and Nagar et al[9] found necrosis in 20% cases. In our study the mortality was 5% (3 patients), who presented with persistent organ failure. study was done by J. Lalith et al[6], mortality was 4% (4 patients), another study done by Sidra et al[5], mortality 5%(4 patients) and Shireen et al[7], mortality 6%(3patients).We found similar results compare to studies done by Sidra et al[5].

In present study , the statistical analysis for the prediction of necrosis has sensitivity of (93.33%, 93.3%), specificity of (96%, 96%), PPV of (93.33%, 93.33%), NPV of (96%,96%), diagnostic accuracy of (95%,95%) for BISAP and Ranson's respectively. This study Compare with another study done by Papachristou et al[10] where sensitivity of (80. 01%,87.65%), specificity of (95%,79.51%), PPV of (56.2%,38.9%), NPV of (84.9%,90.1%), for BISAP and Ranson's respectively and study done by J. Lalith et al[6]. where sensitivity of (81.82%,90.91%), specificity of (94.35%,77.53%), PPV of (64.29%,43.56%), NPV of (97.67%,98.57%), diagnostic accuracy of (93%,91%) for BISAP and Ranson's respectively. So present study results were comparable with the previous studies.

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CONCLUSION

BISAP scoring system is very simple, cheap, easy to remember and calculate. BISAP scoring system accurately predicts the outcome in patients with acute pancreatitis Moreover the values in BISAP score are instantaneous and there is no time delay. Ranson's score takes a minimum of 24 hours. Thus, BISAP score has

proved to be a powerful tool in predicting the severity of acute pancreatitis in par with Ranson's score.

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