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ORIGINAL ARTICLE

BISAP: A NOVEL METHOD FOR ASSESSING SEVERITY OF ACUTE PANCREATITIS

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ABSTRACT: BACKGROUND: There are many multifactorial scoring systems, radiological scores, and biochemical markers are available for early prediction of severity, and mortality in patients with acute pancreatitis (AP). The bedside index for severity in acute pancreatitis (BISAP) has been considered as an accurate method for risk stratification in patients with acute pancreatitis. **OBJECTIVE:** This study aimed to evaluate the usefulness of the BISAP as a predictor for severe pancreatitis. **METHODS AND MATERIAL:** We analyzed 100 patients diagnosed with acute pancreatitis at our hospital between October 2012 and April 2013. We used BISAP score in all such patients within 24 hours of admission. Patient were assessed for organ failure and followed throughout the period of hospitalization for complications. Statistical analysis was made using the student t test and chi-square test and statistical significance was analyzed. **RESULTS:** Out of 100 patients, 20% had severe pancreatitis. Acute Pancreatitis was seen male (87%), in 4th decade (70%), alcohol was the most common etiology (60%), biliary pancreatitis (25%), remaining idiopathic (15%). Patients with BISAP >= 3 was associated with transient or persistent organ failure and pancreatic necrosis. **CONCLUSION:** BISAP scoring is a simple clinical method to identify patients at risk of increased mortality within 24 hours of presentation in patients with acute pancreatitis.

KEYWORDS: BISAP, acute pancreatitis, pancreatic necrosis, sirs.

INTRODUCTION: Acute pancreatitis (AP) is defined as an inflammatory process of the pancreas with possible peripancreatic tissue and multiorgan involvement inducing multiorgan dysfunction syndrome (MODS) with an increased mortality rate.[1] Severe acute pancreatitis implies the presence of organ failure, local complications, or pancreatic necrosis and associated disruption of the pancreatic blood supply.[2,3,4]

Several prognostic markers have been developed for severity stratification in acute pancreatitis. Multifactorial scoring systems incorporating clinical and biochemical criteria for severity assessment have been in use for some decades.[5]

These are based of clinical, laboratorial and radiologic evaluations have been created or adapted to predict outcome, some based on local complications and other reflecting systemic manifestations of AP. Ranson's score[6] is possibly the most used scoring system created specifically for AP. The Acute Physiology and Chronic Health Evaluation II (APACHE II)[7] scoring system was created to evaluate any severe acute illness and has successfully been used to predict AP severity.

Unspecific biomarkers, such as C-reactive protein (CRP) have also been studied as outcome predictors, but it has only been useful for predicting complications, namely necrotizing AP.[8] Here in our study we are using BISAP scoring system for the prediction of the severity of the pancreatitis.

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MATERIALS & METHODS: All patients who presented to KIMS Hospital as acute pancreatitis are included in our study. AP was diagnosed by presence of 2 or more of the following,

1. Severe abdominal pain,
2. Serum Amylase or Lipase more than three times higher than the institution's upper limit, and
3. Contrast-enhanced computed tomography (CECT) of abdomen findings of acute pancreatitis.

Usually, the first two criteria are present, and CECT is not required for diagnosis.

BISAP scoring is one among the clinical methods of assessing the severity of pancreatitis and is done within 24 hours of admission.[9] BISAP >=3 in first 24 hours is predictive of severe pancreatitis. This scoring system predicts severity and mortality risk in acute pancreatitis with fewer easily accessible variables.

Individual components of the BISAP scoring system variables are:

1. Blood urea nitrogen >25mg/dl.
2. Impaired mental status (Glasgow coma scale score<15).
3. SIRS (2 or more of the following).
   Temperature (<36c or >38c).
   Respiratory rate >20/min, paco2 <32 mmHg.
   Pulse > 90/min.
   WBC (<4000, >12000).
4. AGE (>60Yr).
5. Pleural effusion on radiological examination.

One point is assigned for each of the variables above within 24 hours of presentation.

An ultrasound, CECT scan abdomen was done to assess whether the patient have necrotizing pancreatitis or interstitial pancreatitis. As described by Marshall et al., organ failure was considered when score >=2 when one more of the three organ system among the five were involved (Table 1). Organ failure scores were calculated for all the patients within 72 hours of the admission. Duration of organ failure was considered transient (<=48 hours) or persistent when >=48 hours. [10]

Organ system	0	1	2	3	4
respiratory	>400	301-400	201-300	101-200	<101
Renal (s. creatinine)	<1.5	1.5 - <1.9	1.9 -<3.5	3.5 - <5	>=5
Cardiovascular (mm Hg)	>90	<90 responsive to fluids	< 90 not responsive to fluids	<90, ph<7.3	<90, ph<7.2

Table 1

BISAP score was evaluated prospectively using the chi-square test. A p value <0.05 was considered significant during the test. Data analysis was carried out using the SPSS system.

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RESULTS: In our study (Table 2) of 100 patients, male (87%) preponderance was noted in the age group between 30 and 40 year (70%). Alcohol (60%) was the most common etiology followed by biliary pancreatitis (25%), remaining being idiopathic (Figure 1 & 2).

Complications were seen in 20% of the cases in the study with 80% having mild pancreatitis. All those with BISAP score >3 had complications (Figure 3). Renal failure was the most common complication (14 cases) followed by ARDS (3 cases), MODS in 2 cases and one case had cardiac failure (Figure 4). Transient organ failure was seen in 17 of the 20 cases. All these patients recovered without any mortality. Three cases showed persistent organ failure in our study and died due to MODS (2 cases) and ARDS (1 case) with mortality of 3%.

Severity of Acute Pancreatitis was assessed based on the BISAP scoring system. Among the 100 cases, 20 cases had severe pancreatitis (score>3) and 80 cases had mild pancreatitis (score<3). All the 20 cases were managed in the ICU setup for a period between 10-20 days (mean 15 days). Pancreatic necrosis were seen in 20 cases (BISAP >3).Organ failure was also seen in patients with BISAP >3.

DISCUSSION: Acute pancreatitis (AP) is defined as an inflammatory process of the pancreas with possible peripancreatic tissue and multiorgan involvement inducing multiorgan dysfunction syndrome (MODS) with an increased mortality rate.

In western countries, gall stones are the most frequent cause of pancreatitis, in approximately 50% of patients, followed by alcohol (20%), idiopathic in 20% and other known causes in 10% cases (hypercalcemia, hypertriglyceridemia, medications, hereditary causes, sphincter of Oddi dysfunction, pancreas divisum, pancreatic neoplasms, and others).

The diagnosis of acute pancreatitis is based on following criteria, (1) Severe abdominal pain (2) Serum Amylase or Serum Lipase more than three times higher than the institutional upper limit (3) Contrast Enhanced CT scan of abdomen finding of acute pancreatitis. In the first 72-96 hours of disease a CECT scan will often fail to demonstrate pancreatic necrosis and peripancreatic collections. A CECT scan has a place in patients who present after several days of abdominal pain when the amylase and lipase levels may have normalized or in patients with organ failure of unknown origin.

Acute pancreatitis is classified clinically into mild and severe disease. Approximately 20% of patients develop severe acute pancreatitis, defined by organ failure or necrotizing pancreatitis.[11] Severe pancreatitis is associated with a mortality of 15% to 30%, whereas the mortality of mild pancreatitis is only 0% to 1%.[12] Organ failure is the most important determinant for mortality in acute pancreatitis.

Several scoring systems can predict severe complications, but current methods of risk stratification for acute pancreatitis are complicated and require data that are not routinely collected on early stage.[13] A new prognostic scoring system, the bedside index for severity in acute pancreatitis (BISAP), is a simple and accurate method for early identification of patients at risk of in-hospital death .

In this study, we evaluated the usefulness of BISAP as an early marker of the severity of acute pancreatitis. BISAP is simple to calculate, requires only physical examination, vital signs, laboratory data, and imaging for detection of pleural effusion that are commonly documented within 24 hours of presentation. BISAP predicts in-hospital death in the early stages of disease.

Singh et al [14] reported that patients with BISAP score ≥ 3 developed organ failure much more frequently than those with BISAP score <3. In our study, BISAP score ≥3 had a high predictive value for organ failure.

CONCLUSION: The Bedside Index for Severity in AP (BISAP) is an accurate method for early identification of patients at risk for inpatient mortality with acute pancreatitis. It is also an accurate means for risk stratification in patient with AP. The components of the BISAP Scoring System are clinically relevant and easily obtainable within 24hr of admission of the patients. The prognostic accuracy of this system is similar to those of other scoring systems.

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DEMOGRAPHIC, ETIOLOGICAL, IMAGING RESULTS AND OUTCOME OF THE STUDY IN ACUTE PANCREATITIS (n=100)	
Sex distribution	
Male	87
Female	13
Age distribution	
20-30 yr	12
30-40 yr	70
40-50 yr	16
50-60 yr	02
Etiological factors	
Alcohol	60
Biliary	25
Idiopathic	15
Imaging (CECT Abdomen)	
Necrotizing pancreatitis	20
Non- necrotizing pancreatitis	80
BISAP SCORE	
Score <3	80
Score >3	20
Outcome	
No organ failure	80
Transient organ failure	17
Persistent organ failure	03
Deaths	03

TABLE 2

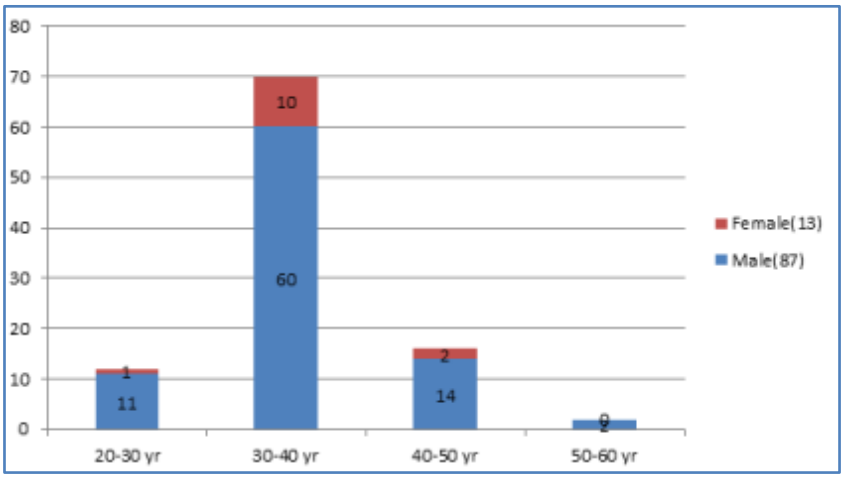

Fig. 1: Age and Sex distribution

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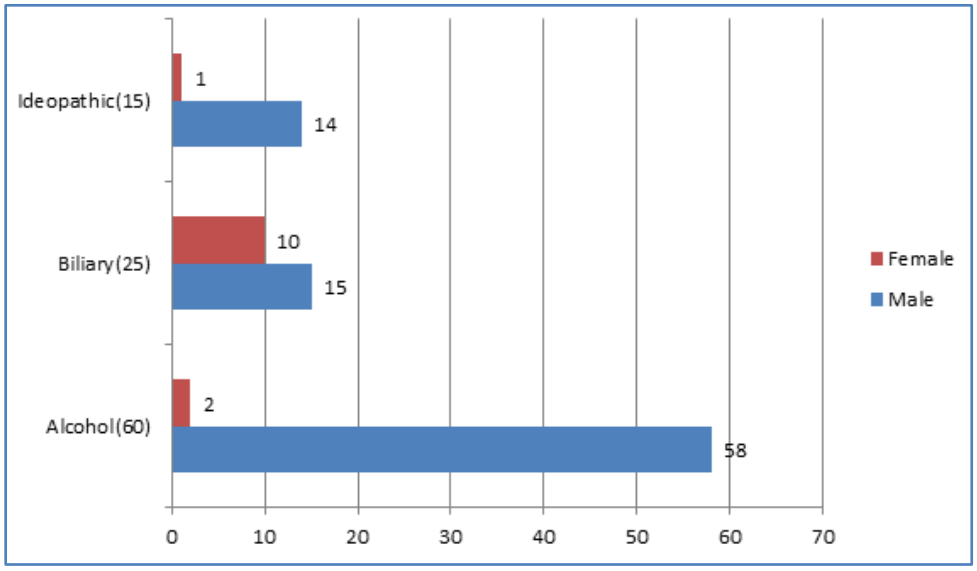

Fig. 2: Etiological factors

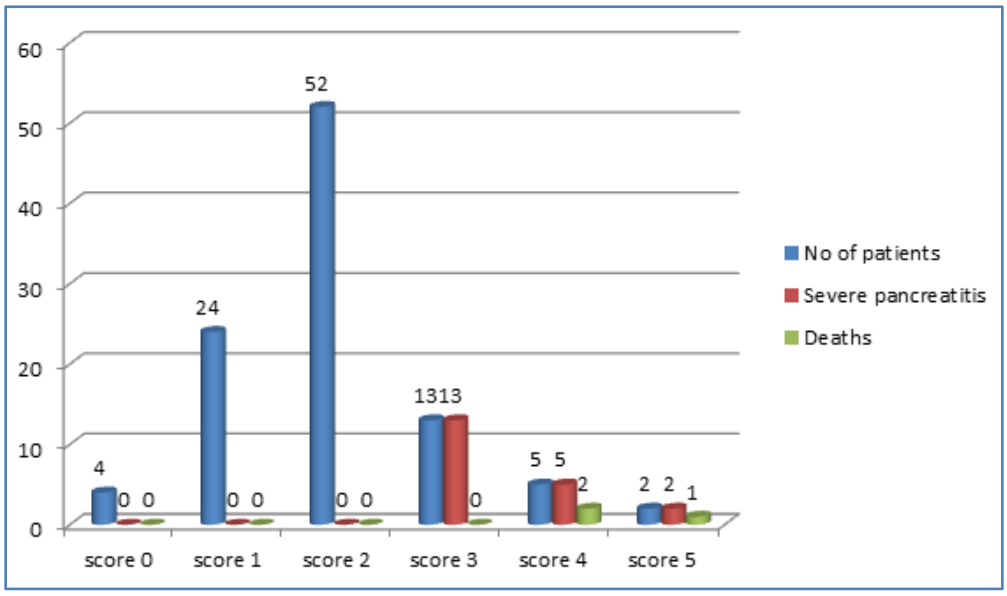

Fig. 3: Distribution of severe pancreatitis and mortality with respect to BISAP Scoring system

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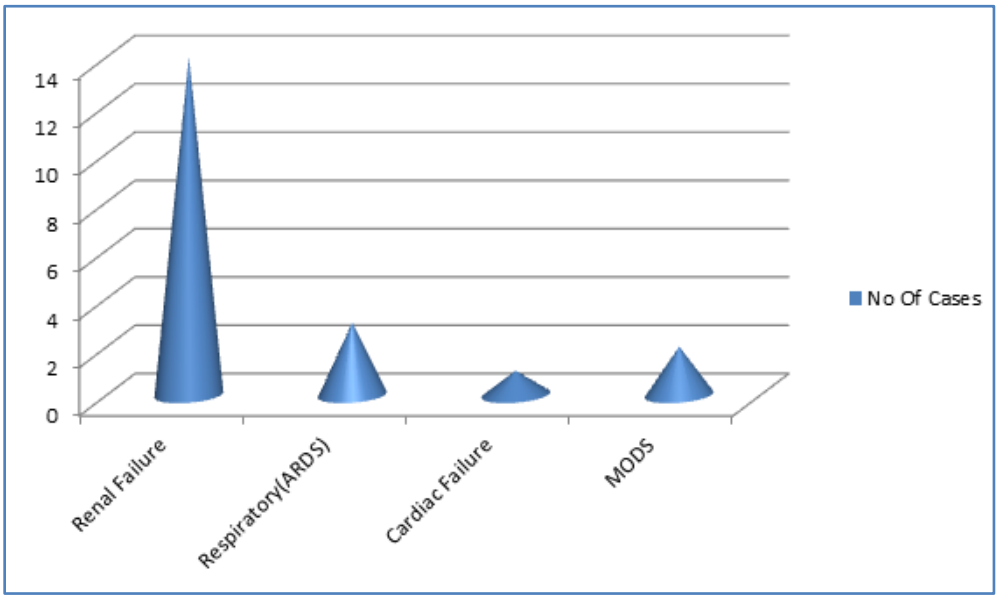

Fig. 4: Incidence of organ failures in severe pancreatitis

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