Original Research Article

Validity of bedside index of severity in acute pancreatitis score in comparison with C reactive protein in assessing the severity of acute pancreatitis

Ramalingam Trivikraman*, Ramesan Chayampurath, Joji I. Malieckal

Department of General Surgery, Medical College, Calicut, Kerala, India

*Correspondence:
Dr. Ramalingam Trivikraman,
E-mail: ramdaffodils@gmail.com

ABSTRACT

Background: Acute pancreatitis is a process of acute inflammation of the pancreas usually caused by biliary stones, alcohol ingestion, metabolic factors or drugs. The assessment of the severity of acute pancreatitis has a significant role in its management. There is a need for a simple and clinically oriented severity scoring system that can predict severity of acute pancreatitis at the time of presentation.

Methods: A cross-sectional study was conducted at a tertiary care centre on 100 patients diagnosed as acute pancreatitis who fulfilled the inclusion criteria. Severity index, their BISAP Score, BMI and CRP values were calculated and statistical analysis was done using SPSS 17 Software.

Results: In our study, there were 100 patients with pancreatitis. 65% were alcoholic pancreatitis followed by gall stone pancreatitis (17%), idiopathic pancreatitis (13%), drug induced (1%), trauma (1%), post ERCP (1%) and malignancy (2%). On the basis of CT Severity index, it was found that 15% of alcoholic group, 8% of biliary group and 1% each of idiopathic, drug induced, trauma and malignancy group were found to have severe pancreatitis. On the basis of BISAP Score it was found that 17% in alcoholic group, 7% in gall stone group, 4% in idiopathic group, 2% in malignancy group and 1% each in drug induced and trauma group were having acute pancreatitis. With the C reactive Protein level, it was found that 16% in alcoholic group, 9% in biliary group and 1% each in idiopathic, trauma and malignancy group were found to have severe pancreatitis. The sensitivity and specificity for BISAP score were 77.8% and 84.9% and the sensitivity and specificity for CRP were 66.7% and 86.3%. The K-score was found to be 0.593 for BISAP Score and 0.524 for C - reactive protein levels. This indicates that both are in moderate agreement with the gold standard test (CT Severity Index).

Conclusions: BISAP score and CRP levels are not superior to the each other in predicting severity. BISAP score can be used as a predictor of severity at admission and CRP levels ≥150 can predict severity when serially monitored during the course of admission.

Keywords: BISAP, CRP, CT severity index, Pancreatitis

INTRODUCTION

Acute pancreatitis is a process of acute inflammation of the pancreas usually caused by biliary stones, alcohol ingestion, metabolic factors or drugs. It is generally classified into mild and severe forms. Mild pancreatitis, also called interstitial or oedematous pancreatitis is associated with minimal organ failure and an uneventful recovery period. Severe pancreatitis, also called necrotizing pancreatitis, occurs approximately in 20% of the patients. It is associated with organ failure and local complications like necrosis, infection and pseudocyst formation.[1,2] The diagnosis is usually established by leucocytosis, elevated serum amylase and elevated serum

lipase. A Computed Tomography (CT) scan confirms the clinical diagnosis of acute pancreatitis.

The assessment of the severity of acute pancreatitis has a significant role in its management. Mild pancreatitis responds well to the supportive therapy, whereas severe pancreatitis requires intensive monitoring and aggressive treatment. Though many scoring systems are present, they include many variables and cause an increase in the cost of the treatment. India is a developing nation where pancreatitis is more common in alcoholics, most of whose families live in poverty. There is a need for a simple and clinically oriented severity scoring system that can predict severity of acute pancreatitis at the time of presentation.[3] Early recognition of severe disease would enable the clinician to consider more aggressive intervention at the right time so that potential adverse outcomes and morbidity can be prevented. The ideal predictor of the severity of acute pancreatitis is described as being simple, quick to perform, highly sensitive, highly specific, safe, reproducible and inexpensive; but unfortunately such an ideal predictor does not exist.[4]

METHODS

A cross sectional was conducted at a tertiary care centre in South India after obtaining approval from the Institutional Ethics Committee. 100 patients diagnosed as acute pancreatitis for the first time between the time period (January 2013 to January 2015) who fulfilled the inclusion criteria were included in present study.

Inclusion criteria

- Cases diagnosed as acute pancreatitis for the first time.
- Cases classified as having severe pancreatitis according to Atlanta classification
- Biochemical evidence: Serum amylase and Serum Lipase elevated to more than three times the upper limit of reference range.
- Imaging evidence in favor of acute pancreatitis
- Cases diagnosed as either alcoholic/gall stone/ idiopathic pancreatitis.

Exclusion criteria

- Recurrent acute pancreatitis.
- Chronic pancreatitis (± calcific)
- Patients not willing to participate in the study

Their clinical, bio chemical and imaging details along with their particulars were documented. Contrast enhanced CT was taken for all patients and the CT Severity Index was calculated. CTSI was taken as the gold standard test to assess severity of pancreatitis in this study. Following this, their BISAP Score, BMI and CRP values were calculated and statistically analysed. BISAP score stands for Bedside Index of Severity in Acute

Pancreatitis and consists of five variables namely Blood Urea Nitrogen greater than 25, Impaired mental status, SIRS, Age more than 60years, presence of pleural effusion with one point given to each variable. Cut-off values for CRP was taken as ≥150 1, for BISAP score as ≥3/5 2 and for CT Severity Index as ≥7/10 3 to define a patient as having severe acute pancreatitis.

SPSS Version 17 was used for analysis. Results were graphically represented wherever deemed necessary

RESULTS

There were 100 patients of acute pancreatitis enrolled in present study. Out of 100, 86 were males and 14 were females. Among the various etiological factors of acute pancreatitis, 65% was due to alcohol, followed by gall stones (17%) and idiopathic pancreatitis (13%). Most common etiology among males was alcohol (65%) and most common etiology among female was gall stones (12%). Majority were in the age group of 30-40years (29%).
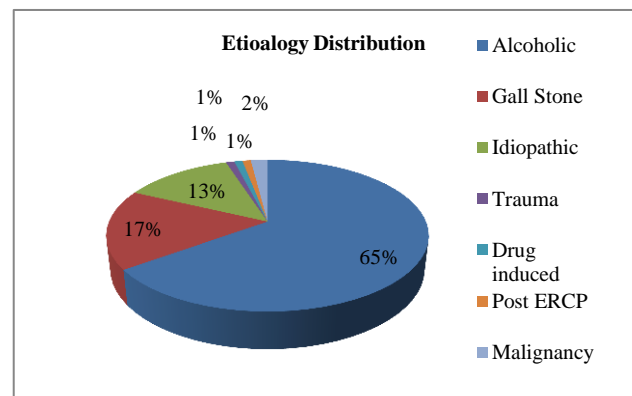

Figure 1: Etiology wise distribution of cases.

The level of Sr. Lipase was found to be statistically significant among various etiologies (p<0.01).
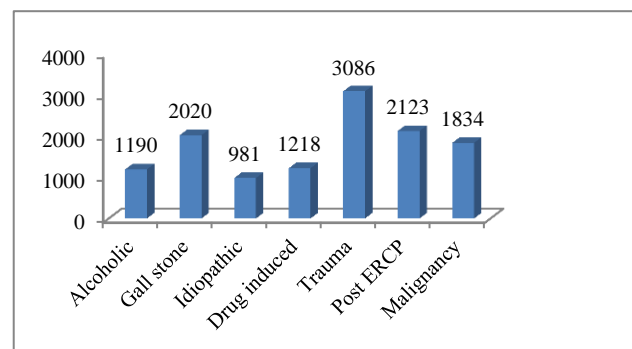

Figure 2: Distribution of serum lipase among various etiologies.

On the basis of CT Severity Index severe pancreatitis was diagnosed in 15% alcoholic pancreatitis, 8% gall stone

pancreatitis and 1% each of idiopathic, trauma induced, malignancy and drug induced pancreatitis.
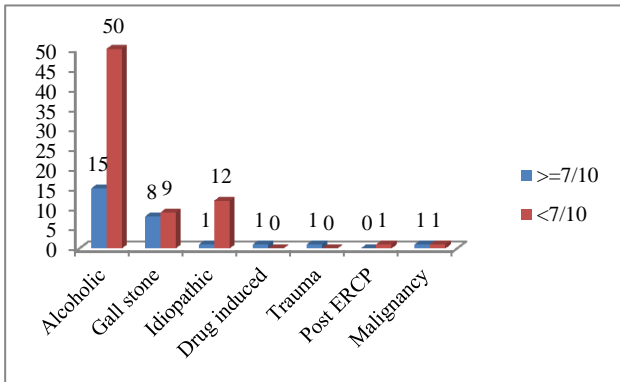

Figure 3: Distribution of CTSI across various etiologies.

On the basis of BISAP score, severe pancreatitis was diagnosed in 17% alcoholic pancreatitis, 7% gall stone pancreatitis, 2% malignancy and 1% each of trauma and drug induced pancreatitis.
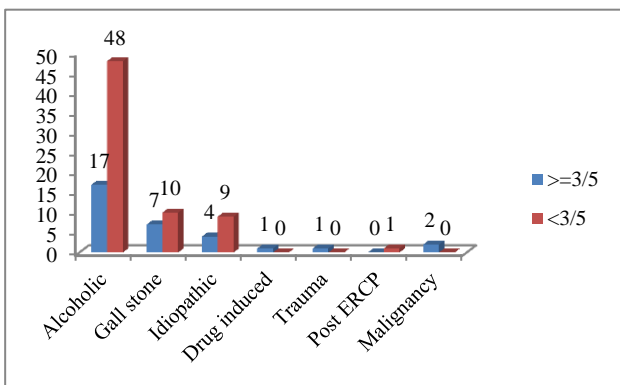

Figure 4: Distribution of BISAP score across various etiologies.

On the basis of CRP levels >150, severe pancreatitis was diagnosed in 16% alcoholic pancreatitis, 9% gall stone pancreatitis and 1% each of idiopathic, malignancy and trauma induced pancreatitis.
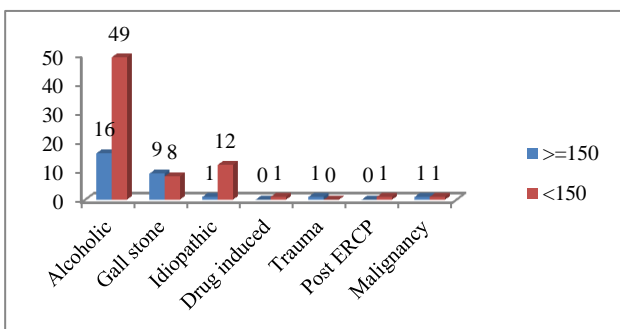

Figure 5: Distribution of CRP levels across various etiologies.

4% of study population was found to be obese of which 1% was in drug induced and 3% was in gall stone pancreatitis group. There were four deaths in the study period of which two were in the alcoholic pancreatitis group and one each in the drug induced, malignancy and biliary group.

Using the Chi square test, the BISAP score was found to be in moderate agreement with CT Severity index with a sensitivity of 77.8% , specificity of 84.9%, positive predictive value of 65.6% and a negative predictive value of 91.2% and a K score of 0.593.The CRP levels were also found to be in moderate agreement with CT Severity index with a sensitivity of 66.7%, specificity of 86.3%, positive predictive value of 64.3% and a negative predictive value of 87.5% and a K score of 0.524.The inclusion of obesity in the BISAP score (BISAP-O) does not seem to improve the sensitivity of BISAP score.

DISCUSSION

This study was conducted to determine the validity of a simple bed side clinical scale BISAP in assessing the severity of acute pancreatitis in comparison to the C reactive protein. Majority of the patients in our study were in the age group of 30-40years (29%) followed by 40-50 (21%) and 50-60 (18%). Similar observation was made by a study conducted by Lankish et al.[4]

Majority of cases was due to alcoholic pancreatitis (65%) followed by gall stone pancreatitis (17%), idiopathic pancreatitis (13%), drug induced (1%), trauma (1%), post ERCP (1%) and malignancy (2%). This is in contrast to the study done in California, USA by Frey, Charles F, et al (1994-2001) in which 32.6% cases were due to biliary pancreatitis, 20.3% due to alcohol and 36.6.% were idiopathic. In another study by H Birgisson, PH Moller et al the causes were gall stones (42%), alcohol (32%), miscellaneous (24%) and idiopathic (2%). In a study from Kolkata, India by Baig SJ, Rahed A, Sen S, the etiologies were alcohol in 41.4%, gall stones in 23.5%, trauma in 17.6%, idiopathic in 12%.

Among the serum enzymes, in our study it was found that elevation of lipase was more statistically significant among the etiologies than amylase. And there are many studies which indicate that Serum lipase may remain elevated slightly longer than amylase. Serum lipase is preferred because it remains normal in some non-pancreatic conditions that increase serum amylase including macroamylasemia and parotitis. In general, serum lipase is thought to be more sensitive and specific than serum amylase in the diagnosis of acute pancreatitis.[5]

C.T severity index was taken as gold standard in our study to which the BISAP score and CRP were compared. The CTSI is a very important diagnostic tool and it has been found to more accurately diagnose clinically severe disease and better correlate with the

need for intervention and pancreatic infection as observed by bollen et al.[6-8]

Though there are studies which refute the superiority of BISAP over CRP in predicting the severity of acute pancreatitis and vice versa, in present study it was found that both BISAP and CRP were found to be in moderate agreement with the CT severity index. There are studies which indicate that BISAP score is superior in predicting severity of pancreatitis and there are studies which indicate that CRP is superior in predicting severity.[9,10] But studies indicate that CRP being an acute phase reactant is elevated in any condition that produces SIRS and the serial measurement of CRP during the course of the admission is more predictive of disease severity than a single measurement at observation.[1] There are also studies which indicate that CRP is a better predictor of severity that BISAP score.[10,11]

In present study there were 4 obese patients and all the four obese patients were having a BISAP score of >3/5 indicating severe pancreatitis. So the sensitivity did not change after inclusion of obesity in BISAP scores (BISAP-O). This is in comparison to the study published by Guzman Calderon Et al which showed that the inclusion of obesity increased the sensitivity of BISAP score.[12]

CONCLUSION

Thus to conclude, severe acute pancreatitis is an illness with considerable morbidity and mortality which can be reduced by proper patient education with emphasis on avoidance of alcohol which is the major etiological factor. Though BISAP score and CRP levels are not superior to the each other in predicting severity, BISAP score can be used as a predictor of severity at admission and CRP levels ≥150 can predict severity when serially monitored during the course of admission.

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