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A Comparative Study of Clinical and Radiological Scoring Systems in the Early Prediction of Severity in Acute Pancreatitis

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Abstract :
Introduction : *Acute pancreatitis is commonly caused by alcoholism and gallstone in our part of the world.The presentation varies from mild abdomen pain to septic shock with multi organ failure. Since there is no specific treatment for acute pancreatitis it is very important to predict its severity at the time of onset itself which may caution the medical professionals to give intensive care to the particular patient.*
Aims and objectives: *Aim of our study is to compare two different scoring systems namely BISAP scoring and MCTSI scoring in acute pancreatitis and to conclude as to which one is cheaper and better in predicting the severity of the disease.*
Materials and methods: *A prospective study done at Government Mohan Kumaramangalm Medical College Hospital for a time period of 1 year from November 2016 to november 2017 in 100 patients.*
Inclusion criteria- *All patients diagnosed as acute pancreatitis and satisfying atleast 2 of the following three criteria*
1.Epigastric pain with or without radiation to back
2.Serum amylase or lipase elevated atleast 3 times the nnormal
3.Characteristic finding of Acute Pancreatitis on abdominal CT.
Exclusion criteria: *Patients with pre existing CKD which may be associated with elevated BUN..*
Conclusion:*Individual response to pancreatic injury is highly variable. To classify patients with acute pancreatitis in to mild and severe groups BISAP is a reliable prognostic tool.It is easy to estimate also.All patients with BISAP scoring > 2 must undergo CT scan.*
Keywords – Acute Pancreatitis, BISAP, CT SCAN, Epigastric pain, MCTSI.

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I. Introduction:

Acute pancreatitis is an acute inflammatory process involovng pancreas na dperi pancreatic tissue wit a range of severity as well as local and systemic complications.Usually its clinical course is mild and resolves without much of sequlae. However in certain groups 10-20% MODS may develop in whom the mortality rates may reach about 30%. Clinical biomarkers play a vital role in triage , management and in predicting the development of life threatening complications.

Patient with severe disease benefit from early detection of organ failure ,antibiotic administration and treatment for the etiological factors.80% of cases are due to alcohol or gallstones.

Severe acute pancreatitis is defined by reverse Atlanta classification of 2012 by the presence of organ failure that persists more than 48 hrs.Organ failure is determined by cardiovascular,renal and respiratory systems.Different scoring systems used to predict the severity of pancreatitis inclue APACHE II score with 14 criteria and the Ranson's score with 11 criteria. MOSS score with 12 criteria and BISAP score wit 5 criteria are the new scoring systems. Baltazar described CT severity index which was modified in to MCTSI –Modified CT Severity Index by Silverman et al in 2004.CTSI is calculcated using CT scan features of acute pancreatitis and pancreatic necrosis. BISAP score is a 5 point bedside score. It is inexpensive and easy to perform. It uses BUN,mental status,SIRS,age,pleural effusion.

II. Aims And Objectives

To compare BISAP (BUN>25mg/dl, Impaired mental status,SIRS,Age>60 and pleural effusion.)
with Modified CT severity Index in predicting
1.severity
2.Pancreatic necrosis
3.Mortality in patients with acute pancreatitis.

III. Materials And Methods

The study was conducted in 100 cases of acute pancreatitis in Government Mohan kumaramangalam medical college hospital admitted in the department of general surgery.

INCLUSION CRITERIA

All patients diagnosed as acute pancreatitis and satisfying atleast 2 of the following three criteria
1.Epigastric pain with or without radiation to back
2.Serum amylase or lipase elevated atleast 3 times the normal
3.Characteristic finding of Acute Pancreatitis on abdominal CT.

EXCLUSION CRITERIA

Patients with pre existing CKD which may be associated with elevated BUN..
BISAP score is calculated for all cases using data collected within first 24 hours. A score of 1 is given for each criteria with a maximum score of 5.

CRITERIA FOR BISAP SCORE

1. **BUN> 25 mg/dl**
2. **Abnormal mental status with GCS<15**
3. **Evidence of SIRS**
4. **Age>60 yrs**
5. **Presence of pleural effusion in xrays**

MODIFIED CT SEVERITY INDEX

It is calculated from CECT within 48 hors.

1. Normal pancreas-0
2. Intrinsic pancreas abnormality with peripancreatic fat stranding -2
3. Peripancreatic fluid collection-4
4. Pancreatic necrosis

a. Absent-0
b. <30% -2
c. >=30% -2

5. Extra pancreatic complications-2

Patients were closely monitored for pancreatic necrosis and organ failure.Based on the organ failure patients were classified into mild and severe acute pancreatitis.organ failure is defined by

- Shock- systolic BP<90 mmhg
- Pulmonary insufficiency P02<60 mmhg at room air or need of mechanical ventilator.
- Renal failure serum creatinin>2 mg/dl after rehydration or hemodialysis.

STATISTICAL ANALYSIS

The data collected were analysed with SPSS software version 21.0 and a valur=e of <0.05 was considered significant.

IV. Results

Out of 100 patients 41% were in third decade of age.
97% were males.the most common etiology for acute pancreatitis was alcohol contributing 46% followed by gallstones at 27%.clinically guarding was present in 88% patients.Lenght of hospital stay was directly related to BISAP score and MCTSI score for discharged patients. Mean serum amylase level for the patients was 563 IU.29 cases fulfilled the criteria for acute severe pancreatitis. This was taken as the standard to compare BISAP score and MCTSI.

Table 1 BISAP SCORE

BISAP	NO.OF PATIENTS	PERCENTAGE	SAP
0	**40**	**40**	**0**
1	**20**	**20**	**3**
2	**16**	**16**	**7**
3	**15**	**15**	**11**
4	**9**	**9**	**8**

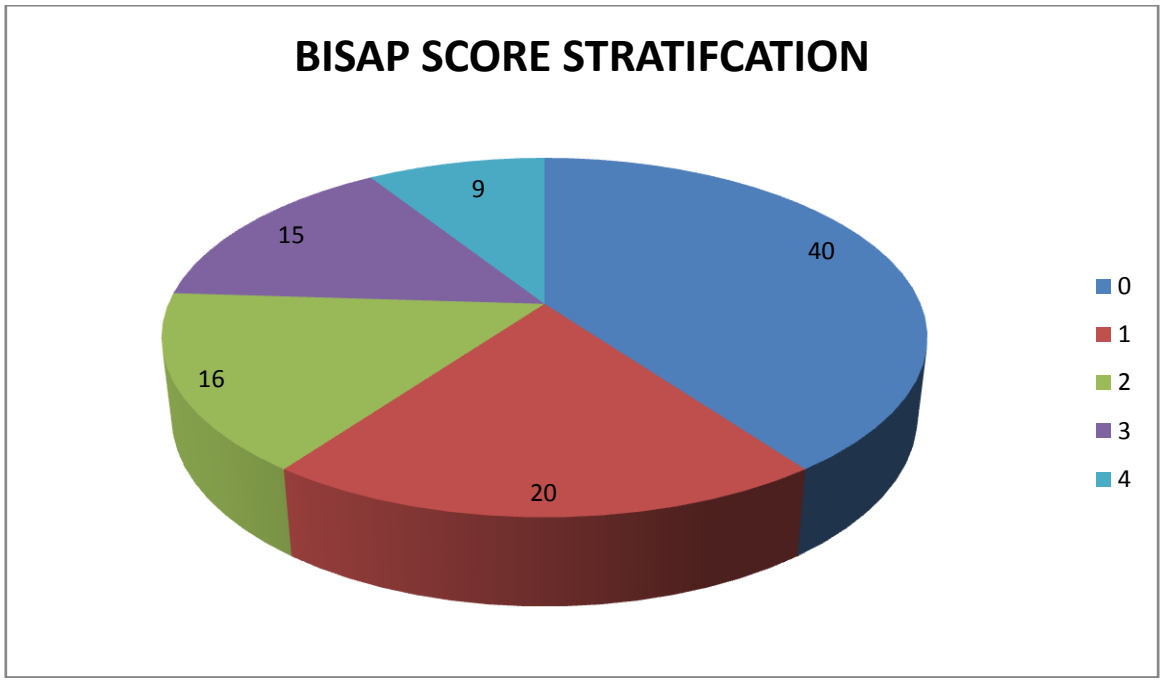

FIG BISAP SCORE STRATIFACTION

TABLE 2 MODIFIED CT SEVERITY INDEX

MCTSI SCORE	NO OF PATIENTS	PERCENTAGE	SAP
0	**31**	**31**	**0**
1	**38**	**38**	**9**
2	**15**	**30**	**8**
3	**11**	**22**	**7**
4	**5**	**10**	**5**

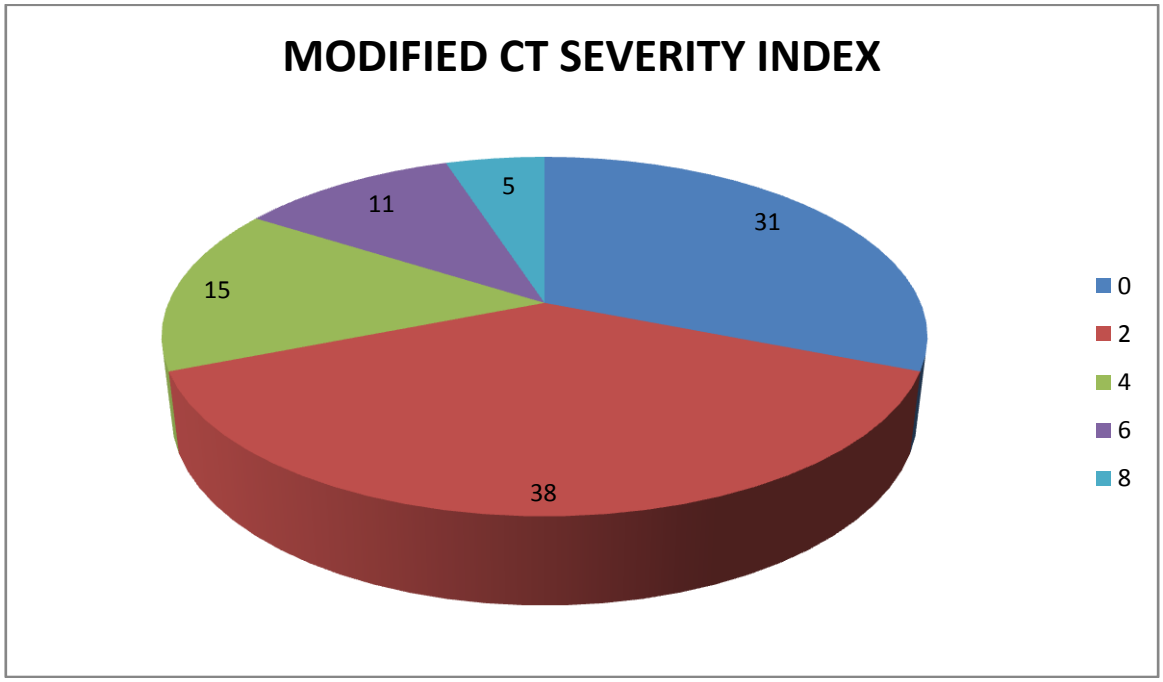

FIG 2 MCTSI

TABLE 3 PREDICTION OF SEVERITY OF DISEASE WITH BISAP SCORE

BISAP SCORE	SEVERE	MILD
>=3	19	5
<3	10	66
TOTAL	29	71

TABLE 4 PREDICTION OF SEVERITY WITH MCTSI

MCTSI	SEVERE	MILD
>=4	20	11
<4`	9	60
TOTAL	29	71

TABLE 5 COMPARISON OF BISAP AND MCTSI IN PREDICTING SEVERITY

SCORING SYSTEM	**BISAP**	**MCTSI**
SENSITIVITY	65.52	68.97
SPECIFICITY	92.96	84.51
POSITIVE PREDICTIVE VALUE	79.17	64.52
NEGATIVE PREDICTIVE VALUE	86.84	86.96

TABLE 6 COMPARISION OF BISAP AND MCTSI IN PREDICTING NECROSIS

SCORING SYSTEM	**BISAP**	**MCTSI**
SENSITIVITY	85.71	100
SPECIFICITY	75	75
POSITIVE PREDICTIVE VALUE	66.67	83.75
NEGATIVE PREDICTIVE VALUE	90	100
ODDS RATIO	3.96	23

V. Discussion

Acute pancreatitis is a condition with high incidence of severity and mortality associated with it.therefore determining the severity of the disease of utmost importance.in this study we had 97% males.alcohol was the commonest cause.29% developed acute severe pancreatitis.th inhospital mortality rate was 8%. All the 8 patients who dis=ed had BISAP score>3 and MCTSI >4. Singh et al studied 397 patients in Harvard medical school. They observed that patients with BISAP score >=3 were 4 times more likely to develop pancreatic necrosis than those with score <3. MCTSI >=4 were 18 times more likely to develop pancreatic necrosis.our study also shoe=ws that MCTSI predicts pancreatric necrosis better than BISAP. Also patients with BISAP >3 had thirty eight times more chance of ending up in death compared to those with less scores.

VI. Conclusion

Individual response to pancreatic injury is highly variable. To classify patients with acute pancreatitis in to mild and severe groups BISAP is a reliable prognostic tool.It is easy to estimate alsonegative predictive valur=e for BISAP is very high..All patients with BISAP scoring > 2 must undergo CT scan. In conclusion BISAP score is an ideal tool for predicting severity of acute pancreatitis.

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