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"A Comparative Study of PANC 3 Score and Modified Ct Severity Index in Predicting Severity of Acute Pancreatitis"

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I. Introduction

Acute Pancreatitis is a common disorder due to development of acute inflammation of normally existing Pancreas. Acute Pancreatitis includes varying type of diseases from mild self-limiting symptoms to fulminant multi organ failure and high mortality. The overall mortality rate is 3-10%, where in 11-30% of cases with severe disease manifested as pancreatic necrosis.

Acute pancreatitis refers to an acute inflammatory process of the pancreas, usually accompanied by abdominal pain and elevations of serum pancreatic enzymes.

This syndrome is usually a discrete episode, which may cause varying degrees of injury to the pancreas, and adjacent and distant organs. The incidence of acute pancreatitis has wide variability within populations, with about 1–5 cases per 10,000 population per year. Eighty percent of the cases of acute pancreatitis in the are related to alcohol use or biliary stones.

Pancreatitis may be classified as mild, moderate, or severe based on physiological findings, laboratory values, and radiological imaging. Mild disease is not associated with complications or organ dysfunction and recovery is uneventful. In contrast, severe pancreatitis is characterized by pancreatic dysfunction, local and systemic complications, and a complicated recovery. In addition, pancreatitis may be further classified into acute interstitial and acute hemorrhagic disease. In the first type, the gland architecture is preserved but is edematous. Inflammatory cells and interstitial edema are prominent within the parenchyma. Hemorrhagic disease is characterized by marked necrosis, hemorrhage of the tissue, and fat necrosis. There is marked pancreatic necrosis along with vascular inflammation and thrombosis.

Acute Pancreatitis was diagnosed when two of the three following criteria were met:

1. Elevated Amylase/Lipase defined as three times the upper limits of normal,
2. Radiological evidence of pancreatitis,
3. Abdominal pain.

In 1879, Reginaald Fitz described the classic clinico pathological features of acute pancreatitis and discussed in detail about the ineffectiveness and hazards of early operative intervention.

The reason behind the assessment of severity is mainly for practical purpose, where mild pancreatitis responds to supportive treatment very well but severe acute pancreatitis needs some intensive monitoring of numerous parameters, specific therapeutic interventions and it has very good prognosis.[2]

Since 1963, several scoring systems have been created clinically and radiologically for this purpose,, including Bedside index for severity in Acute pancreatitis (BISAP) score, Acute physiology and chronic health evaluation (APACHE,1 11,111 & O) score, Medical Research Council Sepsis Scoring (MRCS), Modified Glasgow score (IMRIE'S),Balthazar computed tomography (CT) grading, Marshall Scoring system for Organ failure. The Ranson's and Modified Glasgow score (IMRIE'S) contain's data which are not routinely collected during hospitalization. Both these study require 48 hrs to complete there by reducing the most necessary early therapeutic window period.

An ideal prognostic method should be able to differentiate between patient's with mild & severe disease, easy to use and widely available and should be accurate, and should have low inter observer variability. It should also be able to apply early in disease process so that patient who could prone to develop potential complications will be closely monitored and treated if possible empirically. This study aims to analyse and compare the PANC3 score and modified CT severity index in predicting the severity of acute pancreatitis.

II. Aims and Objectives

AIM:
To analyse and compare THE PANC 3 SCORE AND MODIFIED CT SEVERITY INDEX IN PREDICTING SEVERITY OF ACUTE PANCREATITIS.

OBJECTIVE:
The objective is to identify the scoring system which is simple to use, cost effective yet accurate to identify the severity of the disease at the earliest aiding in management of the severity of the disease.

III. Materials And Methods

Study Design : Prospective Comparative Analytical study
Setting : Department of General Surgery, Govt Theni Medical College and Hospital, Theni. The study was conducted after obtaining the Institutional Ethical Committee approval
INCLUSION CRITERIA

- Characteristic abdominal pain.
- Serum amylase/lipase (>3 times of its normal value).
- Presents within 24 hours of onset of symptoms

EXCLUSION CRITERIA

- Pancreatic abscess
- Pancreatic pseudocyst
- Pancreatic necrosis
- Co morbidities: copd, bronchial asthma, DM, HT, CAD
- Patients presenting more than 24 hours of onset of pain
- CKD and renal failures patients
- CVA patients
- Salivary gland disease, bowel obstruction, myocardial infarction, cholecystitis, perforation.

METHODS

First 50 patients attending the surgical emergency ward with clinical features of Acute Pancreatitis are evaluated clinically and subjected to laboratory and radiological investigations as per the designed proforma. Data pertinent to the scoring systems will be recorded with in 24 hours of admission to the hospital.
Once diagnosis is established the patient disease severity will be assessed by following two scoring system.

Statistical Analysis : Appropriate statistical tools.

For each of 50 patients included in the study, PANC3 score and MCTSI scores were calculated by the manner described by Knaus et al and Cardinal Health Database system.

Survivors were defined as patients discharged alive from the hospital and non – survivors were those who died from pancreatitis or its complications during hospitalization.

Biliary Pancreatitis was presence of gall stones /biliary sludge in the gallbladder or bileduct, which was documented by any radiological methods. Alcoholic Pancreatitis was considered, when the patient found to have regular high intake of alcohol daily, or if there was binge of alcohol consumption prior to the onset of illness and has no signs of other etiologies present. Idiopathic pancreatitis was the one with no identifiable etiological factor based on history, or after initial investigations.

Patient were observed prospectively until discharge or death.

PANC3 score- all the3 Factors and MCTSI score more than or equal to 8 were expected to predict severe Acute Pancreatitis.

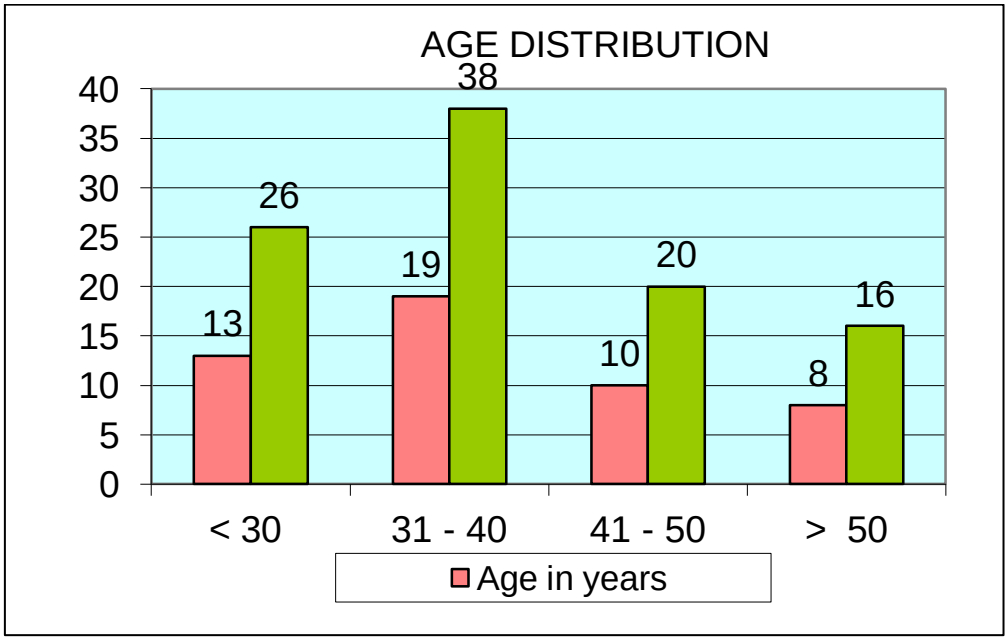
IV. Observation & Results

This study was conducted in the department of general surgery, Govt Theni Medical College & Hospital, Theni for a period of one year. The 50 persons with features of acute pancreatitis were enrolled in this study after obtaining an informed consent.

Table 1: AGE WISE DISTRIBUTION

Age in years	Age in years	Age in years
< 30	13	26
31 - 40	19	38
41 - 50	10	20
> 50	8	16

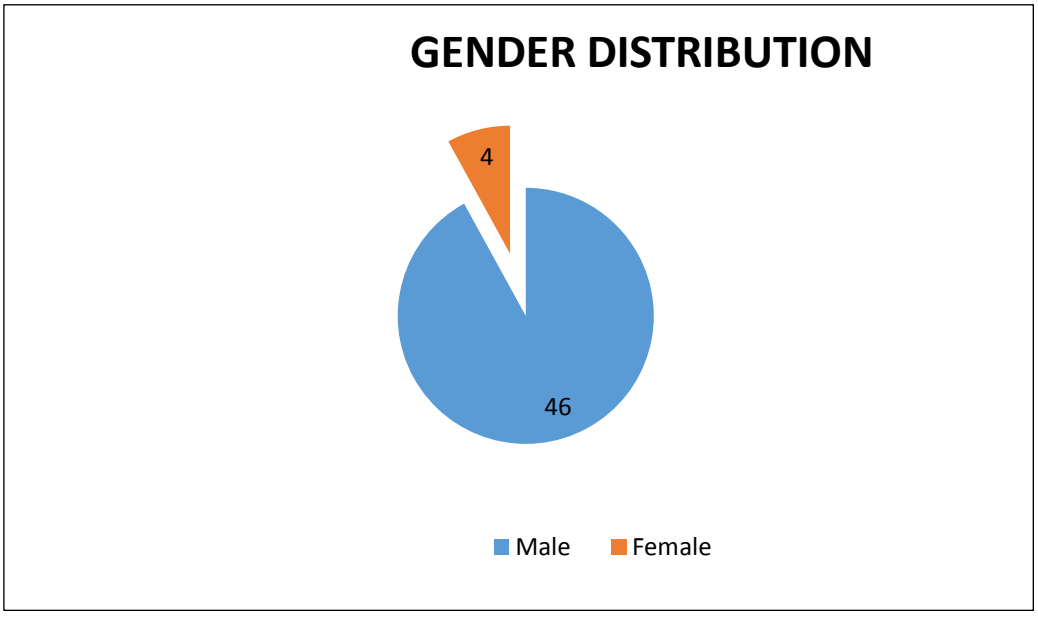
Total	50	100
Mean age	38.52	



The age group of patients enrolled in this study ranges from 30-50yrs.the peak incidence of the disease was noted in age group between 31-40yrs

Table 2: GENDER DISTRIBUTIONS

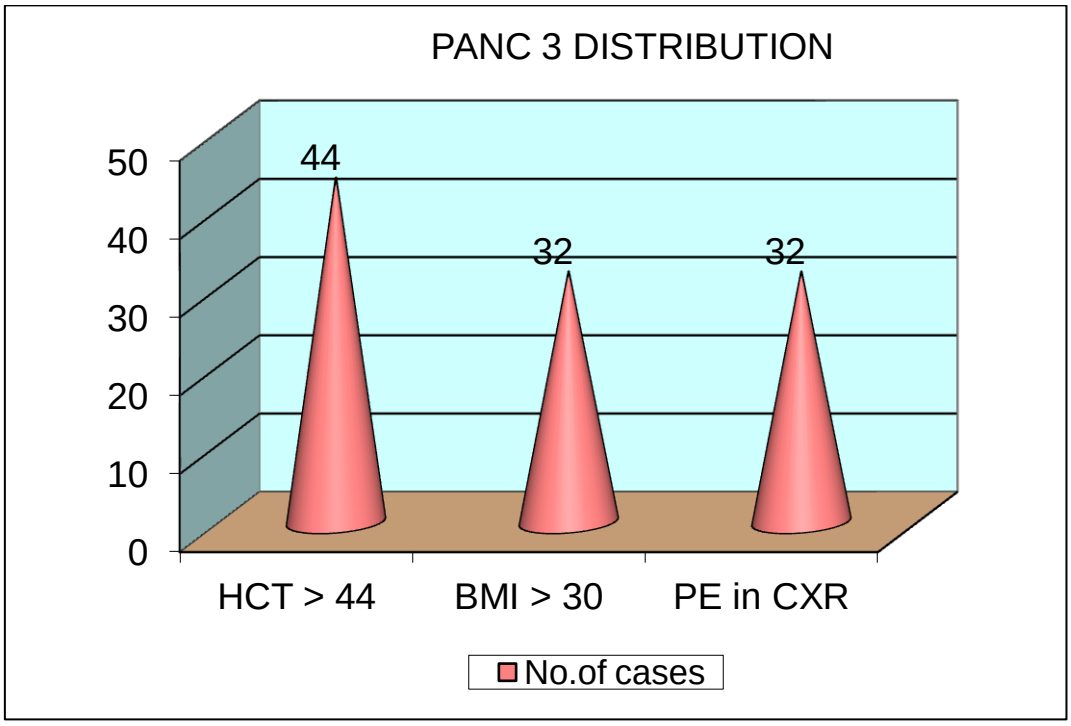
Gender	No.of cases	Percentage
Male	46	92
Female	4	8
Total	50	100



Out of 50 patients enrolled in this study there were 46 male and 4 female patients.

Table 3:PANC3 distribution

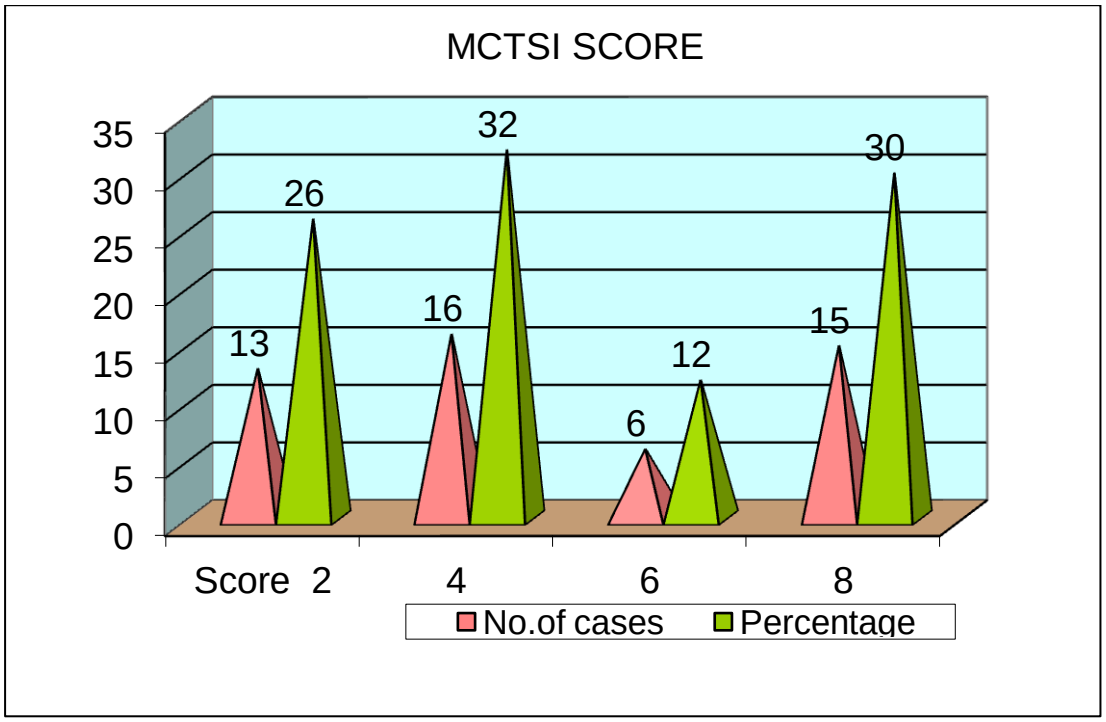
PANC 3	No.of cases	Percentage
HCT > 44	44	88
BMI > 30	32	64
PE in CXR	32	64



Among 50 patients enrolled in this study 44patients had HCT>44
32out of 50 had BMI>30.
32 Patients out of 50 had pleural effusion in chest xray

Table 4: MCTSI SCORE

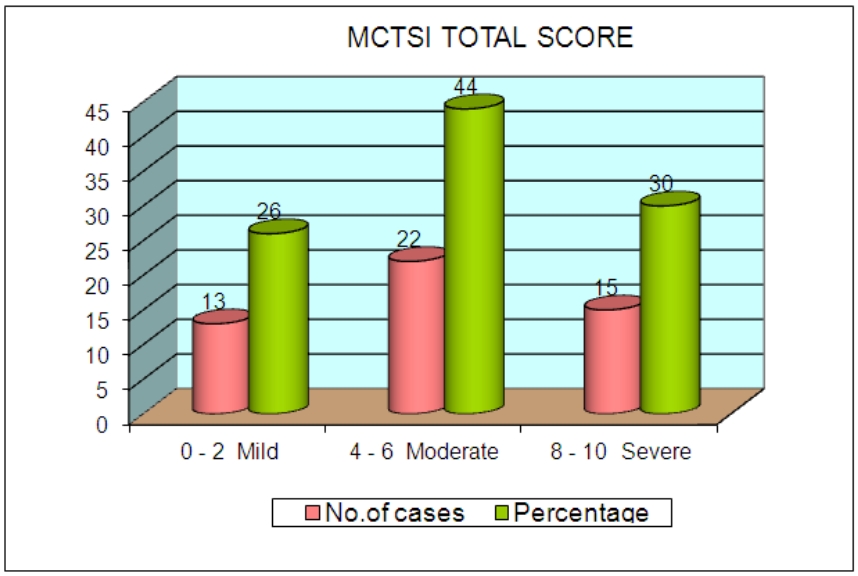
MCTSI Total Score	No.of cases	Percentage
Score 2	13	26
4	16	32
6	6	12
8	15	30
Total	50	100



among 50 patients enrolled in this study,
13 out of 50 patients have score 2(mild)—26 %
16 out of 50 patients have score 4(moderate)-32%
6 out of 50 patients have score 6(moderate)-12%
15 out of 50 patients have score 8(severe)-30%

TABLE 5: MCTSI TOTAL SCORE

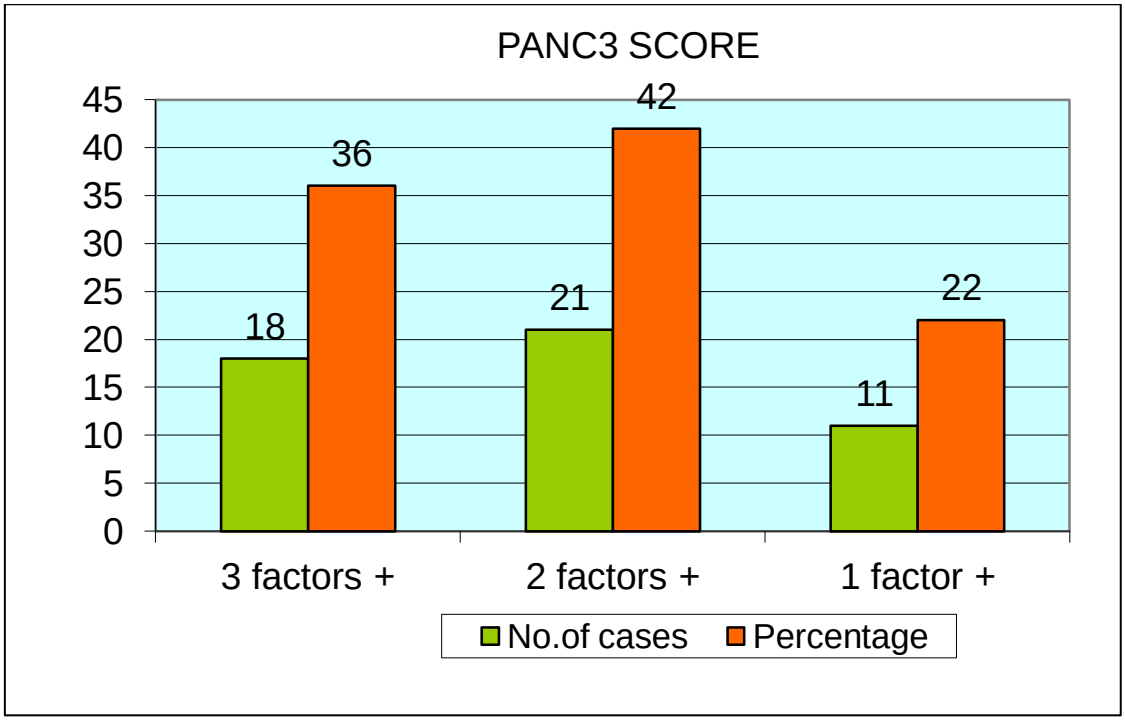
MCTSI Total Score	No.of cases	Percentage
0 - 2 Mild	13	26
4 - 6 Moderate	22	44
8 - 10 Severe	15	30
Total	50	100



Among 50 patients enrolled in this study
According to MCTSI,
13 Patients have mild pancreatitis-26%
22 patients have moderate pancreatitis-44%
15 patients have severe pancreatitis-30%

TABLE 6: PANC3 SCORE FACTORS

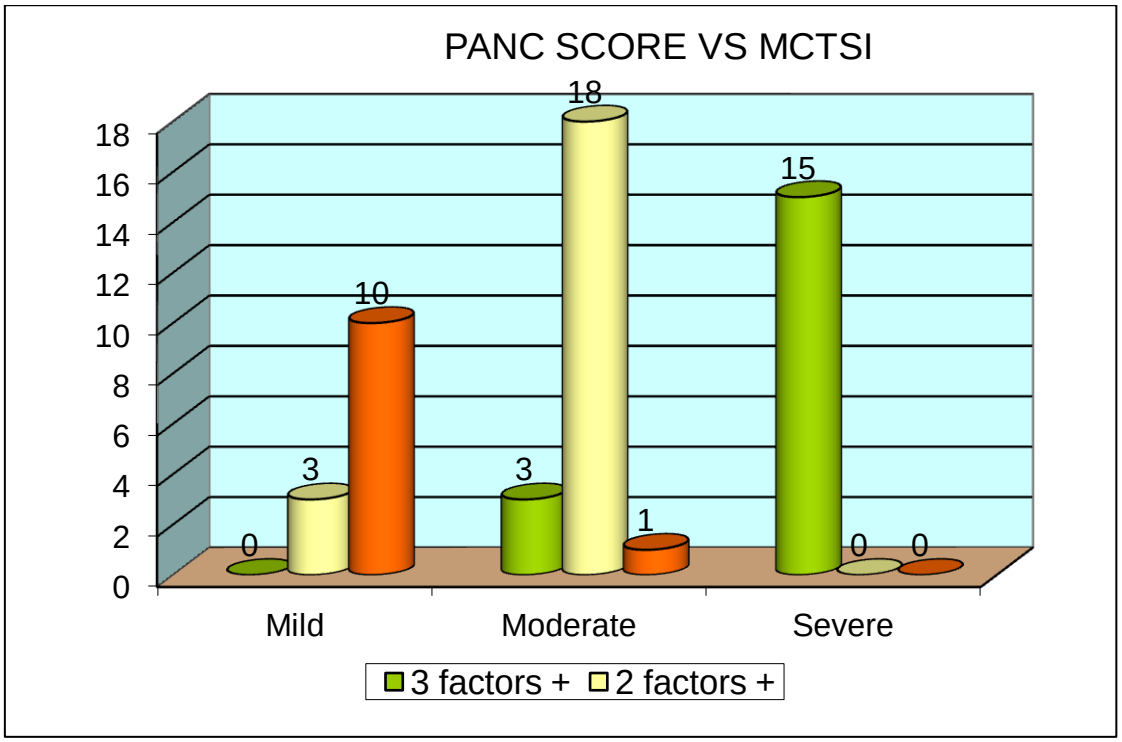
PANC score	No.of cases	Percentage
3 factors +	18	36
2 factors +	21	42
1 factor +	11	22
Total	50	100



Among 50 patients enrolled in this study,
According to PANC3 SCORE
3Factors present in 18 patients, which is 36%
2factors present in 21 patients, which is 42%
1 factor present in 11patients, which is 22%

TABLE: 7 MCTSI VS PANC3 SCORE

	PANC 3 SCORE			
MCTSI	**3 factors +**	**2 factors +**	**1 factor +**	**Total**
Mild	_	3	10	13
Moderate	3	18	1	22
Severe	15	_	_	15

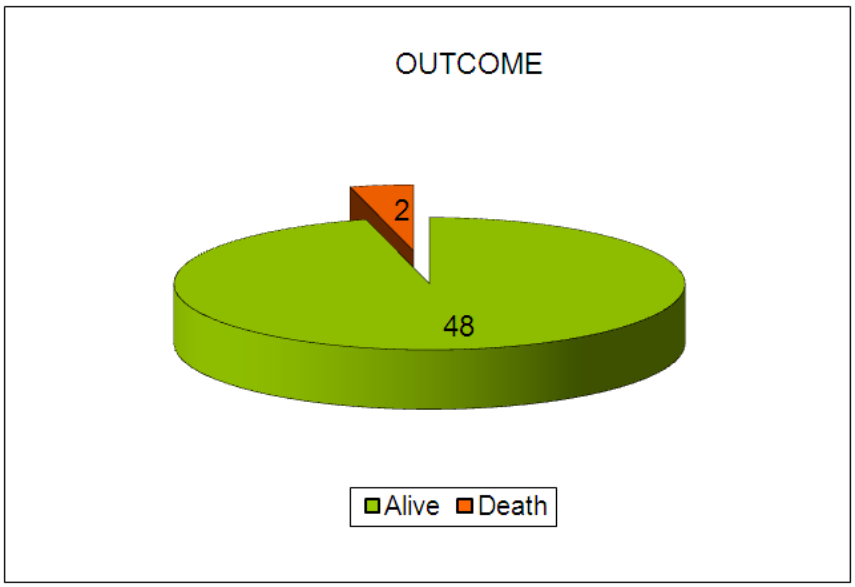


Among 50 patients, according to MCTSI and panc3 score.
13 patients with mild pancreatitis, 1factor of panc3 score present in 10 patients, 2 factors present in 3 patients.
22 patients with moderate pancreatitis, 3 factors present in 3 patients, 2 factors present in 18 patients, 1factor present in 1 patient.
15 patients with severe pancreatitis, 3factors present in 15 patient.

Correlation coefficient =0.570423
Good correlation between PANC3 SCORE and MCTSI

TABLE 8: DISEASE OUTCOME

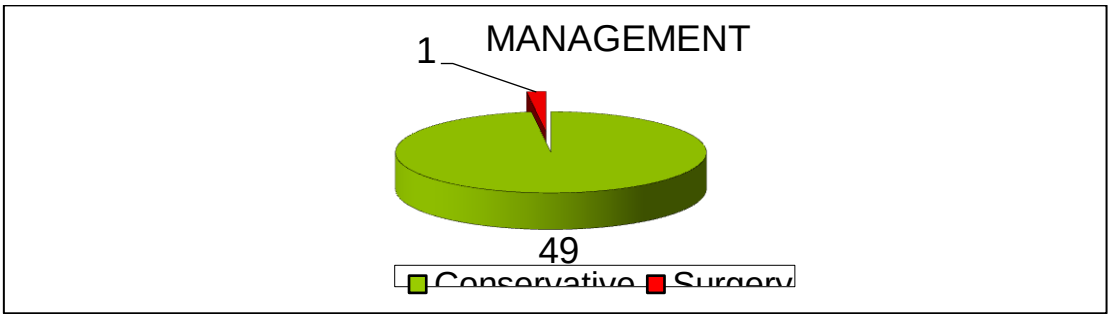
Outcome	No.of cases	Percentage
Alive	48	96
Death	2	4
Total	50	100



Out of 50 patients 48 patients were alive 2patients were died.

TABLE 9: MANAGEMENT

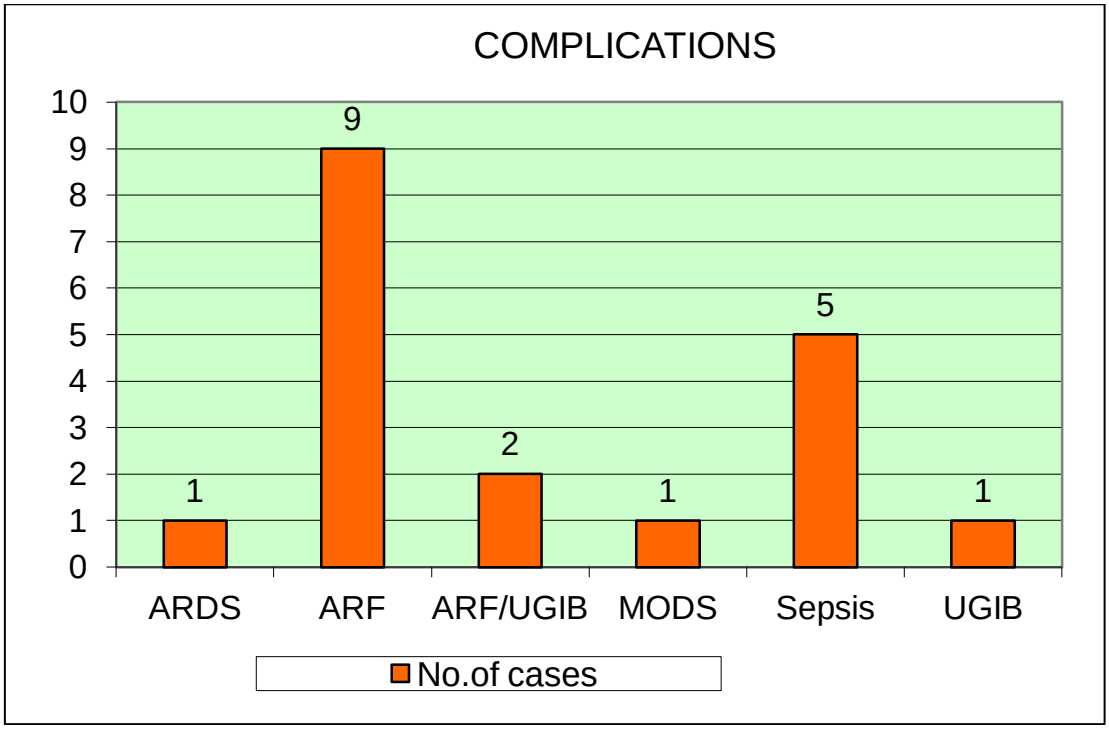
Management	No.of cases	Percentage
Conservative	49	98
Surgery	1	2
Total	50	100



Out of 50 patients, 49 patients managed conservatively,1patient underwent surgery.

TABLE 9: COMPLICATIONS

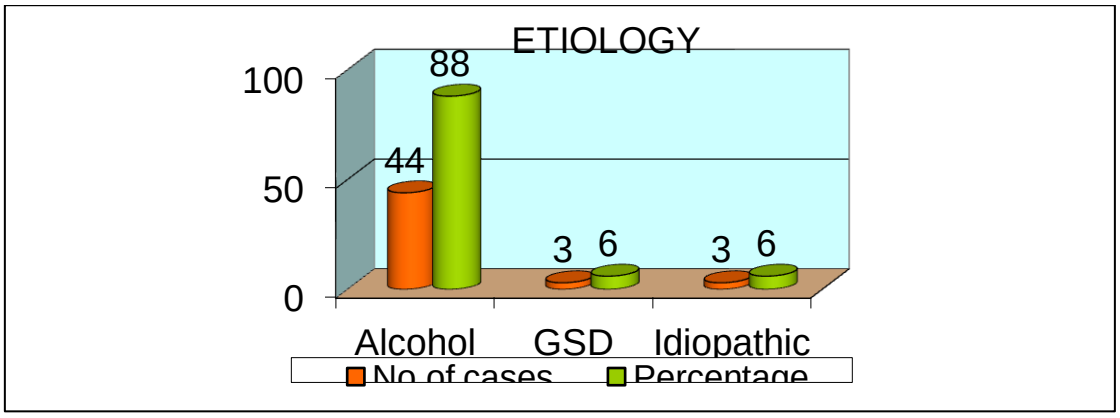
Complications	No.of cases	Percentage
ARDS	1	2
ARF	9	18
ARF/UGIB	2	4
MODS	1	2
Sepsis	5	10
UGIB	1	2
Total	19	38



Among 50 patients 19 patients (38%) developed complications like ARDS, ARF, MODS, SEPSIS, UGIB. Out of 19 patients with complications ARF occurred in 9 patients (18%).

TABLE 10: ETIOLOGY

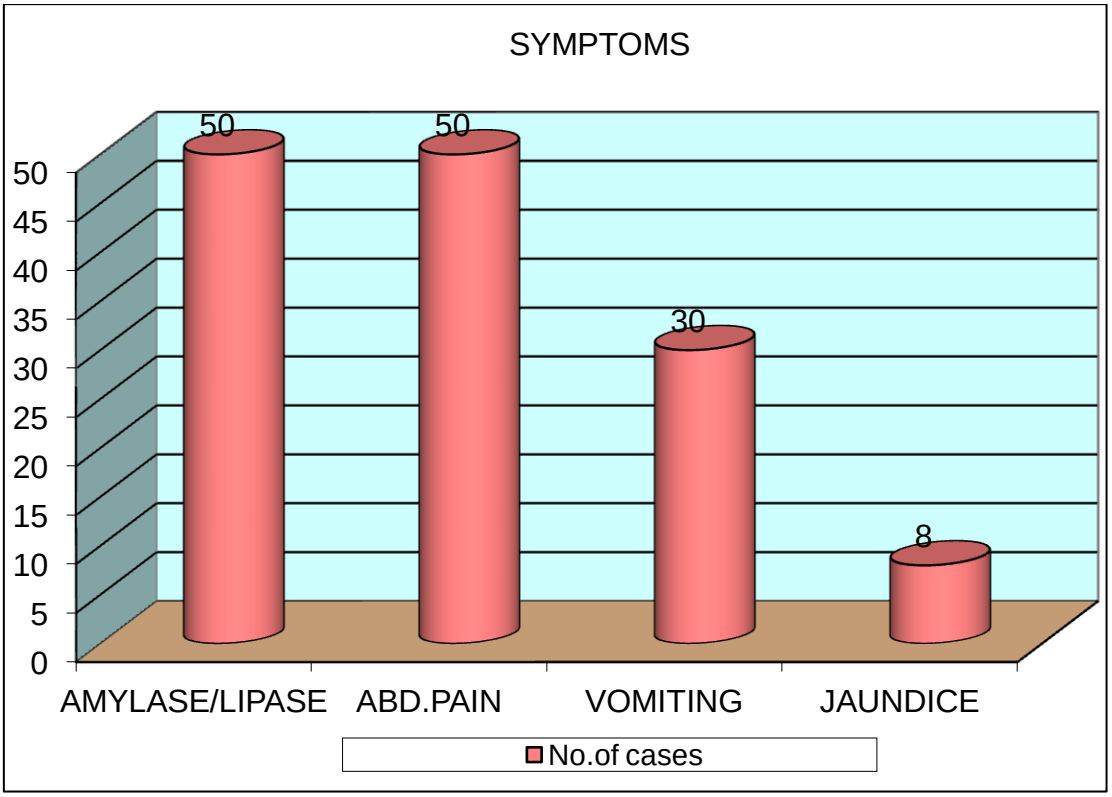
Etiology	No.of cases	Percentage
Alcohol	44	88
GSD	3	6
Idiopathic	3	6
Total	50	100



Among 50 patients in this study
44 patients had etiology of alcohol which is 88%
3 patients had etiology of gallstone disease which is 6%
3 patients had idiopathic cause which is 6%

TABLE 11: PATIENT SYMPTOMS AND AMYLASE/LIPASE LEVELS

Factors	No.of cases	Percentage
AMYLASE/LIPASE	50	100
ABD.PAIN	50	100
VOMITING	30	60
JAUNDICE	8	16
FEVER	14	28



Among 50 patients enrolled in this study, all the 50 patients (100%) had characteristic abdominal pain
30 out of 50 had vomiting (60%)
8out of 50 had jaundice (16%)
14 out of 50 had fever (28%)
All 50 patients (100%) had elevated amylase/lipase levels

V. Discussion

Acute pancreatitis is a common disorder with wide spectrum of illnesses. Severe pancreatitis having high morbidity and mortality rate, multiple interventions have been tried to prevent this. Early hospitalization may be beneficial to identify those who require aggressive interventions to prevent the severe attack of Acute Pancreatitis.

Prediction of severity is an essential step in the management of acute pancreatitis. Approximately 15%–30% patients present with severe disease and the early recognition of such patients is essential to avoid morbidity and mortality associated with the attack. 50% mortality associated with severe acute pancreatitis can be reduced to 8% by early recognition of a case.

In this study, the two different scoring systems (PANC3 SCORE and MCTSI) were compared and analzed to assess the severity in patients with acute pancreatitis.

PANC3 score was devised by Brown et al. in a retrospective study on 393 patients. They found out that all three factors combined had a post-test likelihood ratio of 99% of developing severe acute pancreatitis.[17]

James Ken **FUKUDA**, et al conducted a comparative study between PANC 3 criteria and Ranson criteria. PANC 3 results showed 31.25% sensibility; 100% specificity; 100% positive predictive value; 81.66% negative predictive value and 83.07% accuracy.

In this study Acute pancreatitis is 10 times more common in males than females. This could be explained by the fact that, in this study alcohol has found to be most common etiological factor and it's more common in males.

In this study Male patient in 3rd decade affected more

- The most common etiological factor in this study was alcohol, Gall stones and idiopathic causes are next common etiological factors
- In this study 44patients had HCT>44 which is 88%
- 32Patients out of 50 had BMI>30 which is 64%
- 32Patients out of 50 had pleural effusion in chest xray which is 64%
- In this study According to MCTSI,
- 13 Patients have mild pancreatitis-26%
- 22 patients have moderate pancreatitis-44%
- 15 patients have severe pancreatitis-30%

In this study 13PATIENTS with mild pancreatitis, 1factor of panc3 score present in 10 patients, 2factors present in 3 patients

22 patients with moderate pancreatitis, 3 factors present in 3 patients, 2 factors present in 18 patients, 1 factor present in 1 patient

15 patients with severe pancreatitis, 3factors present in 15patients

Limitations of this study are

1. Small number of patients in this study.
2. The etiology in this study were found to be different from world wide accepted one, hence might not be correct to compare with other studies
3. Various factors associated with the disease like cholangitis, alcohol withdrawal may interfere with the assessment of physiological scores, which may leads to difference in the results.
4. Recently, it has been suggested that severe acute pancreatitis may have variable disease progression: therefore the lack of predictability might be associated with this disease variability.
5. Variation in timing of patients to the hospital after onset of symptoms may interfere with assessment of the scoring systems..

VI. Conclusion

Assessment of severity of pancreatitis helps in better outcome of the patient in terms of morbidity and mortality, as we can give early and advanced care to those in need (that is in cases of acute severe pancreatitis).

Various scoring systems are in use to assess the severity and each one has its pros and cons. Some have better predictability but have to wait for 48 h. For full scoring, others can be used to assess the severity at admission and have good predictability but very cumbersome to use and not universally available. The single best marker for predicting severity has yet to be found though serum CRP, TAP, etc., are being studied.

PANC3 scoring system is one of the better systems because the three criteria used are simple, easy to assess, available at every health-care center, and cost of assessing is low compared to other systems

The ultimate goal of any scoring system or markers is to predict the patients with severe attack early in the course of disease and be able to interrupt the cascade of inflammatory response leading to MODS and ultimately death. PANC3 scoring system is such an effort to prolong the life of patients by early detection and prompt treatment, its easy to use, cost-effective and hence can be used in peripheral/rural centers for early referral.

PANC3 score was devised by Brown et al. in a retrospective study on 393 patients. They found out that all three factors combined had a post-test likelihood ratio of 99% of developing severe acute pancreatitis.[17]
CT predicts severity only after 48 hrs of onset of disease,
For vitals unstable patients, CT is still not possible even after 48hrs
PANC 3 criteria can be used to define the severity of acute pancreatitis as early as possible to identify and to manage the patient according to severity
From this study, we conclude that PANC3 score could be simple, cost effective and accurate clinical scoring system for the evaluation of disease severity in acute pancreatitis within 24 hrs of onset of disease and admission.

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