



Study Of Clinical Profiles Of Acute Pancreatitis And It's Correlation With Severity Indices

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Abstract:

Introduction:

Acute pancreatitis is a complex condition which varies from mild self-limiting inflammation to rapidly deteriorating condition which poses a serious threat to life. This study aims at the clinical profile of acute pancreatitis and it's correlation with severity indices.

Material Methods:

80 diagnosed cases of acute pancreatitis of any etiology were assessed by clinical evaluation and severity indices like Ranson's score, BISAP Score, APACHE- II, CTSI score.

Results:

Patients mean age was 36.46±11.36 years with maximum cases belonging to age group interval of 30-40 years (36.3%). Study revealed male sex predilection with 84% Males and 16% Females. Maximum patients had Systolic blood pressure between 100-110mmHg (47.5%) and Diastolic blood pressure between 71- 80mmHg (47.5%). In severity indices, maximum patients had Ranson's Score <3 (68.8%), BISAP Score 2 (48.8%), APACHE-II Score 5 (23.8%), and CTSI Score 2 (58.8%). Also, the Ranson's and BISAP Score was significantly correlated with BUN, CRP, ESR, Amylase, Lipase, LDH (P<0.05). APACHE II Score was not significantly correlated with Amylase (P=0.078). The CTSI Score was not correlated with BUN, CRP, ESR, amylase, lipase, LDH (P>0.05).

Conclusion:

Early clinical evaluation and categorisation of Acute Pancreatitis patients according to above mentioned severity scores can help in initial management and prevention of complications.

Keywords: Acute Pancreatitis, Ranson's Score, BISAP Score, APACHE-II Score, CTSI Score

Introduction:

Acute pancreatitis is an inflammatory process with possible peri-pancreatic tissue and multi organ involvement inducing multi organ dysfunction syndrome (MODS) with an increased mortality rate. Multi- factorial scoring systems, which are complex and difficult to use in clinical bases, have been shown

to perform with high negative predictive value but only moderate overall sensitivity [1].

Acute pancreatitis is a common disease with wide clinical variation and its incidence is increasing. The average mortality rate in severe acute pancreatitis approaches 2–10 % [2]. The factors which cause death in most patients with acute pancreatitis seem to be related specifically to multiple organ dysfunction

syndrome and these deaths account for 40–60% of in-hospital deaths in all age groups [3]. According to the severity, acute pancreatitis is divided into mild acute pancreatitis (absence of organ failure and local or systemic complications, moderately severe acute pancreatitis (no organ failure or transient organ failure less than 48 hours with or without local complications) and severe acute pancreatitis (persistent organ failure more than 48 hours that may involve one or multiple organs) [4]. Initial evaluation of severity should include assessment of fluid loss, organ failure (particularly cardiovascular, respiratory, or renal compromise), measurement of the APACHE II score and systemic inflammatory response syndrome (SIRS) score [5].

Routine abdominal computed tomography (CT) scan is not recommended at initial presentation because there is no evidence that CT improves clinical outcomes and the complete extent of pancreatic and peripancreatic necrosis may only become clear 72 hours after the onset of acute pancreatitis [6]. Several other scoring systems also exist to predict the severity of acute pancreatitis based upon clinical, laboratory, radiologic risk factors, and serum markers but can be used only 24 to 48 hours after disease onset and have not been shown to be consistently superior to assessment of SIRS or the APACHE II score. Several classification systems have been presented to assess the severity of acute pancreatitis. Presence of SIRS (Systemic inflammatory response syndrome), scores such as the Ranson, the Glasgow, and Acute Physiology and Chronic Health Evaluation (APACHE) are practical for assessing the severity of the disease but are not sufficiently well validated for predicting mortality. Early organ dysfunction predicts disease severity and patients require early intensive care treatment. Antibiotic prophylaxis is usually ineffective and early enteral feeding results in reduction of local and systemic infection [7,8].

Acute pancreatitis is mild and resolves itself without serious complications in 80% of patients. Morbidity and mortality occur in up to 20% of patients despite the aggressive intervention [9]. This is usually due to systemic inflammatory response syndrome and organ failure in the first two week period, while after two weeks it is usually due to sepsis and its complications [10]. So, with this background, the present study was carried out with the objective to assess the clinical profile of acute pancreatitis and its correlation with

severity indices.

Material And Methods:

This single centre, hospital based cross-sectional observational study was conducted in department of Medicine at DR. B.R.A.M.H Raipur located in Central India. 80 patients diagnosed with acute pancreatitis of any etiology for a period of 2 years from December 2019 to November 2021 were included in this study. Patients with major pancreatic pathologies like hereditary pancreatitis or pancreatic malignancies, ovarian cancer or cysts, emergencies like diabetic ketoacidosis, acute appendicitis and intestinal perforation were excluded from the study. After explaining the study procedure, written informed consent obtained from all the subjects selected for the study. Case records were collected from the medical records department after availing necessary ethical approval from the institution and were meticulously looked for various aspects such as age, sex, clinical presentation were identified. All cases underwent clinical evaluation like blood pressure, heart rate, mean arterial pressure, respiratory rate, temperature, higher mental function, glasgow coma scale on the day of recruitment. Lab investigations like CBC, LFT, RFT, blood sugar, lipid profile, BUN, serum Amylase, serum Lipase, serum Calcium, LDH, CRP, ESR were identified. Radiologically patients underwent CECT abdomen, USG abdomen and Chest Xray. Severity indices like Ranson's Criteria, BISAP Score, APACHE- II, CT SEVERITY INDEX were assessed. The collected data were tabulated and statistically analyzed using SPSS 24.0 version IBM USA. Spearman rank correlation analysis was performed to check the correlation between Rank variable and numerical Variable. Kolmogorove- Smirnov analysis was performed for checking linearity of the data. Chi square test/ Fischer's exact test was used to analyze the significance of difference between frequency distribution of the data. Comparison of mean and SD between two groups was done by using unpaired t test. P value <0.05 was considered as statistically significant.

Results:

Patients demographic data showed that mean age of the patients included in the study was 36.46 ± 11.36 years. Majority of patients belonged to age group 30-40 years i.e. 29 (36.3%). Gender wise appraisal

showed that out of total patients there were 84% Males and 16% Females. In the present study, maximum number of patients belonged to group whose Systolic blood pressure was in between 100-110 which is 38 (47.5%) and the minimum number of Patients belonged to group whose Systolic blood pressure was above 131 which is 4(5%). Maximum number of patients belonged to group whose Diastolic blood pressure was in between 71-80 which is 38(47.5%) and the minimum number of Patients belonged to group whose Diastolic blood pressure was in between 81-90 group which is 2(2.5%). During appraisal of severity indices, maximum number of patients belonged to group whose Ranson's Score was <3 which is 55 (68.8%) and the minimum number of Patients belonged to group whose Ranson's Score was >3 which is 8(10.0%). Also, the Ranson's Severity Score was significantly correlated with all the clinical Profiles like

BUN, CRP, ESR, Amylase, Lipase and LDH. About BISAP Score, maximum number of patients belonged to group whose BISAP Score was 2 which is 39 (48.8%) and the minimum number of patients belonged to group whose BISAP Score was 0 which is 5(6.3%). Also, the BISAP Score was significantly correlated with all the clinical Profiles like BUN, CRP, ESR, Amylase, Lipase and LDH. Furthermore, maximum number of patients belonged to group whose APACHE II Score was 5 which is 19 (23.8%) and the minimum number of patients belonged to group whose APACHE II Score was 11 and 12 which is 1(1.3%). Also, the APACHE II Score was significantly correlated with all the clinical Profiles like BUN, CRP, ESR, Lipase and LDH. but not significantly correlated with Amylase. Maximum number of patients belonged to group whose CTSI Score was 2 which is 47 (58.8%) and the minimum number of patients belonged to group whose CTSI Score was 5 which is 1(1.3%). The CTSI Score was significantly correlated with CRP but no significance correlation was found between CTSI Score and BUN, CRP, ESR, amylase, lipase, LDH.

Discussion:

1) Baseline characteristics-

Out of 80 patients of pancreatitis, in the present study, majority of study subjects 29 (36.3%) belonged to age group 31-40 followed by 24(30 %),

17(21.3%), 7 (8.8%) and 3 (3.8%) in the <30, 41-50, 51-60, and

>60 years of age group respectively. Mean age \pm SD of study subjects was 36.46 ± 11.86 years with range of 18 to 71 years. The findings from the present study is similar to the studies done by Surajit Kumar Das et al., most of the patients were in the age group of 20 – 39 years (63%) followed by 40 – 59 years (28%), 4 % in less than 20 years and 5 % in the age group of 60 – 80 years [11]. Anum Arif et al., found that Mean age (SD) of study subjects Age in year 35.25 ± 8.29 [12]. Vengadkrishnan. K. et al., in Chennai most patients (54) were in the age group of 21 to 40 years followed by 44,9 and 3 were in the age group of 41- 60,>60 and <20 respectively [13]. In the present study most of the participants 67 (83.8%) were male as compared to female 13 (16.3%). The findings from the present study is similar to the studies done by Vengadkrishnan. K. et al., in Chennai found that most of the participants 83 (76%) were male as compare to female 27 (24%) [13]. Surajit Kumar Das et al., observed that males contributed 96% of the patient population and females were 4% only [11]. Vengadkrishnan. K. et al., found that acute pancreatitis was found five times more common in males than in females [13]. Contrast to present study Anum Arif et al., found that most of the participants 125 (60.7%) were female as compare to male 81 (39.3%) [12].

2) Distribution of study subjects according to RANSON'S severity assessment score and correlation with Clinical Profiles-

The Ranson score represented a major advancement in evaluation of disease severity in AP and has been used clinically for more than three decades [14,15]. In this study most of pancreatitis patients 55 (68.8%) had RANSON'S score <3, followed by 17 (21.3%) had score 3 and 8 (10%) had score >3. The Ranson's

severity score is significantly correlated with all the clinical Profiles BUN, CRP, ESR, AMYLASE, LIPASE and LDH with ($P < 0.01$). Cho et al., found most of pancreatitis patients 59.6% had RANSON'S score ≥ 3 , followed by 40.4% had score <2. In severe pancreatitis patients most of patients 18.6% had had RANSON'S score ≥ 3 , followed by 4.6 % had score <2 [16]. Anum Arif et al., observed most of pancreatitis patients 32.5% had RANSON'S score 2 followed by 31.5%, 13.6%, 12.6% & 9.7% had score 1, 4, 5-7 & 3

respectively. They take Cutoff of ≥ 3 score values as criteria for SAP. 35.90% (n=74) patients had SAP condition according to Ranson's score [12]. Jadhav SC et al., observed that (n=100) according to Ranson score severity of AP, 3 patients (3%) with Ranson score less than 3 with complications of AP and patients with complications and Ranson score more than 3. 24 patients are with Ranson score more than 3 and they are without complications while 20 patients are without complications with score less than 3 [17].

3) Distribution of study subjects according to BISAP'S severity assessment score and correlation with

Clinical Profiles-

In current study most of pancreatitis patients 39(48.8%) had BISAP score 2, followed by 25 (31.3%), 11 (13.8%) and 5(6.3%) had score 1, 3 and 0 respectively. Mean (SD) for BISAP score was 1.70(0.79). The BISAP severity score is significantly correlated with all the clinical Profiles BUN, CRP, ESR, amylase, lipase and LDH (P<0.01). Cho et al., found Most of pancreatitis patients 67.7% had BISAP'S score <1 followed by 22.3% had score ≥ 2 . In severe pancreatitis patients most of patients 7.3. % had BISAP'S score

<1 followed by 25 % had score ≥ 2 [16]. Anum Arif et al., had observed most of pancreatitis patients 41.5% BISAP'S score 2, followed by 27.2%, 16.5% and 14.6% had score 1, 3 and 4 respectively. They take Cutoff of ≥ 3 score values as criteria for SAP. For BISAP, 31.10% (n=64) patients were found as SAP [12]. Pattanaik et al., found Most of pancreatitis patients 86% had BISAP'S score <3 followed by 14% had BISAP'S score ≥ 3 [18].

6) correlation with Clinical Profiles-

In this study most of the patients 47 (58.8%) had CTSI score 2 followed by 14(17.5%), 12 (15%), 6 (7.5%)&1 (1.3) had 3, 1, 4& 5 CTSI score respectively. Mean (SD) for CTSI score was 2.21(0.84). The CTSI severity score is significantly correlated with CRP but NO significance correlation between CTSI and BUN, CRP, ESR, amylase, lipase and LDH. Cho et al., found Most of pancreatitis patients 62.7% had CTSI score <2 followed by 37.3% had CTSI score ≥ 3 . In severe pancreatitis patients most of patients 23.3% had CTSI score ≥ 3 followed by 6.9 % had score <2 [16]. Yang et al., found 276

4) Distribution of study subjects according to APACHE II severity assessment score and correlation with Clinical Profiles-

APACHE II is a frequently used scoring system to assess severity of AP. It consists of three parts, namely, acute physiology score, age, and chronic health score. In current study majority of study subjects 58 (72.7%) had APACHE II score less than 8 followed by 22 (27.3%) had APACHE II score more than 8. Mean (SD) for APACHE II score was 6.36 (2.18). The APACHE II severity score is significantly correlated with all the clinical Profiles BUN, CRP, ESR, LIPASE and LDH but not significantly correlated with amylase. Similar findings with present study done by Yang et al., showed 248 pancreatitis patients had APACHE II score less than 8 followed by 78 had APACHE II score more than 8 [19]. Jadhav SC et al., observed There were 23 patients (23%) with APACHE II score more than 8 and 34 patients with score less than 8 with complications of AP. While 21 patients (21%) with APACHE score more than 8 without complications and 22 patients with score less than 8 were without complications of AP [17]. Pattanaik et

al., found Most of pancreatitis patients 58% had APACHE II score <9 followed by 42% had APACHE II score ≥ 9 [18]. In contrast to present study, Cho et al., found Most of pancreatitis patients 59.6% had APACHE II score ≥ 8 followed by 40.4% had APACHE II score <7. In severe pancreatitis patients most of patients 17.7% had APACHE II score ≥ 8 followed by 6.2 % had score <7 [16].

5) Distribution of study subjects according to CTSI severity assessment score and pancreatitis patients had CTSI score <4 followed by 50% had ≥ 4 score [19]

Conclusion:

Acute Pancreatitis is a common disease with wide clinical variation and severe complications and its incidence is increasing. Several scoring systems exists to predict severity of Acute Pancreatitis based on clinical, laboratory and radiological parameters. In our study, we found that Ranson's, BISAP & APACHE II severity scores significantly correlated with clinical profiles of Acute Pancreatitis patients. Therefore, prompt clinical evaluation of Acute Pancreatitis as per the mentioned severity scores can

aid in controlling occurrence of complications and

help in providing proper treatment.

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Tables And Figures-

“Table 1 : Baseline characteristics of patients included in the study (n=80)”

Categorical variables	Percentage
Sex	
Males	83.8
Females	16.3
SBP Range (mm of Hg)	
100-110	47.5
111-120	20.0
121-130	27.5
≥131	5.0
DBP Range (mm of Hg)	
50-60	16.3
61-70	33.8
71-80	47.5
81-90	2.5
Continuous variables-	Mean ± SD
Mean age (years)	36.46±11.36

SBP- Systolic blood pressure, DBP- Diastolic blood pressure, SD- standard deviation

“Table 2 : Distribution of study subjects according to severity assessment score (n=80)”

Severity indices	Percentage
RANSON'S Score	
<3	68.8
>3	10.0
3	21.3
BISAP score	
0	6.3
1	31.3
2	48.8
3	13.8
APACHE II score	
2	3.8
3	2.5
4	12.5
5	23.8
6	8.8
7	21.3
8	10.0
9	7.5
10	7.5
11	1.3

I2	1.3
CTSI score	

1	15.0
2	58.8
3	17.5
4	7.5
5	1.3

BISAP- Bedside Index for Severity in Acute Pancreatitis, APACHE II- Acute Physiology and Chronic Health Evaluation II, CTSI- computed tomography severity index

“Table 3 : Correlation between Severity indices and Clinical Profiles (n=80)”

Severity indices	Parameter	ρ	P value
RANSON SCORE	BUN	0.075	0.000
	CRP (mg/L)	0.223	0.000
	ESR (mm/hr)	0.075	0.000
	AMYLASE (IU/L)	0.025	0.001
	LIPASE (IU/L)	0.-011	0.000
	LDH (IU/L)	0.117	0.000
BISAP SCORE	BUN	0.075	0.004
	CRP (mg/L)	0.223	0.000 ^{**}

	ESR (mm/hr)	0.075	0.003
	AMYLASE (IU/L)	0.025	0.018
	LIPASE (IU/L)	0.-011	0.000
	LDH (IU/L)	0.117	0.000 ^{**}
APACHE II	BUN	0.075	0.000
	CRP (mg/L)	0.223	0.000 ^{**}
	ESR (mm/hr)	0.075	0.000 ^{**}
	AMYLASE (IU/L)	0.025	0.078
	LIPASE (IU/L)	0.-011	0.001
	LDH (IU/L)	0.117	0.000
CTSI SCORE	BUN	0.075	0.509
	CRP (mg/L)	0.223	0.047
	ESR (mm/hr)	0.075	0.509
	AMYLASE (IU/L)	0.025	0.826
	LIPASE (IU/L)	0.-011	0.922
	LDH (IU/L)	0.117	0.303

Note: * P- value considered significant difference at 95% CI (P<0.05) ** P- value considered significant difference at 99% CI (P<0.01). BISAP- Bedside Index for Severity in Acute Pancreatitis, APACHE II- Acute Physiology and Chronic Health Evaluation II, CTSI- computed tomography severity index, BUN- blood urea nitrogen, CRP- C Reactive protein, ESR- Erythrocyte sedimentation rate, LDH- lactic acid dehydrogenase