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**A PROSPECTIVE STUDY ON CLINICAL PROFILE AND PROGNOSTIC FACTORS
IN PATIENTS DIAGNOSED WITH ACUTE PANCREATITIS IN A TERTIARY
CARE HOSPITAL**

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Abstract:

Introduction: Acute pancreatitis (AP) is defined as the inflammation of the pancreatic tissue, characterized by parenchymal oedema and necrosis caused by auto-digestion by its own glandular enzymes leading to multi-organ failure or death. Early diagnosis and prompt treatment are the mainstay of the therapy in AP to significantly decrease morbidity and mortality. The best approach is a multidisciplinary one that is adaptable to the individual patient. Hence this study was done to understand the prognostic factors in patients with acute pancreatitis which can be used by the clinicians in assessing patients' condition for better management and to improve outcome, thus decreasing the mortality.

Methodology: A prospective study was done in 100 adult patients of either sex diagnosed with acute pancreatitis in a tertiary care during April 2021 to April 2023. Institutional ethical committee clearance was obtained. Bedside index for severity in acute pancreatitis (BISAP) was calculated within first 24 h of admission. One-way analysis of variance, and Pearson Chi-squared tests were used for statistical analysis. A two-sided $P < 0.05$ was considered statistically significant.

Results: Majority belonged to the age group of 31-40years (49%). Males were 67% and females were 43%. Commonest aetiology was gallstones in 44% followed by alcohol consumption in 32%. Severity of AP was mild, moderate and severe in 42%, 30% and 28% respectively. BISAP score was > 3 in 32% of patients. In hospital mortality was seen in 8% patients. Commonest symptom was abdominal pain in 86% followed by fever 67% and nausea vomiting in 42%.

Conclusion: AP is commonly seen in young age men when compared to women. Mean of BMI, haematocrit, serum creatinine, blood urea nitrogen and CRP increases with increasing severity of acute pancreatitis, and this difference was significant statistically.

Keywords: Acute pancreatitis, prognostic factors, BISAP score, tertiary care.

INTRODUCTION

Acute pancreatitis (AP) is defined as the inflammation of the pancreatic tissue, characterized by parenchymal oedema and necrosis caused by auto-digestion by its own glandular enzymes leading to multi-organ failure or death.[1] Two most common etiological factors, identified were alcohol consumption and gallstones which contribute to 80% of the cases, with alcoholic pancreatitis being much more common[2]. AP can result in a number of localized complications such as pancreatic pseudocysts, walled-off pancreatic necrosis (WON), and disconnected pancreatic duct syndrome (DPDS)[3].

The severity of pancreatitis varies from mild and self-limiting to severe and fatal[4]. Severity is an important indicator of mortality and the need for intensive care, nutritional support, urgent surgical intervention, and antibiotic usage[5].

Severe acute pancreatitis (SAP) is associated with high morbidity and mortality due to the development of pancreatic and extra-pancreatic necrosis, their subsequent infection and multisystem organ failure (MOF)[6,7,8].

There are various scoring systems (Ranson, APACHE II, SOFA, BISAP, etc.) that help stratify the severity of AP. The bedside index for severity in AP (BISAP) is a simple clinical scoring system, which stratifies patients within the first 24 h of admission to the hospital according to their risk of in-hospital mortality and helps identify patients at increased risk for mortality before the onset of organ failure. A score of > 3 is associated with 5%-20% mortality [9,10].

Despite the existence of several criteria, it is not easy to predict its subsequent course because often in patients with the same initial clinical and radiological scores, the clinical course of the disease may vary[11].

Early diagnosis and prompt treatment are the mainstay of the therapy in AP to significantly decrease morbidity and mortality, there have been many advancements in the intensive care of patients with AP due to its association with high morbidity and mortality [2]. The best approach is a multidisciplinary one that is adaptable to the individual patient. As SAP depends on multiple factors, like expertise available at a given center, specific patient characteristics and risk assessment findings[11].

Hence this study was done to understand the prognostic factors in patients with acute pancreatitis which can be used by the clinicians in assessing patients' condition for better management to improve outcome thus decreasing the mortality.

METHODOLOGY

A prospective study was done in 100 adult patients of either sex diagnosed with acute pancreatitis in a tertiary care during April 2021 to April 2023. Institutional ethical committee clearance was obtained.

All patients who visited (surgical OPD and emergency department) and admitted in indoor and fulfilling two out of three criteria. (i) Abdominal pain suggestive of AP, (ii) serum amylase and/or lipase levels at least three times the upper limit of normal, and (iii) Radiological findings suggestive of AP on abdominal ultrasonography and/or CT scan and/or MRI were included in the study as per the Atlanta Classification 2012[12]. Severity is classified as mild, moderate or severe. Mild acute pancreatitis, the most common form, has no organ failure, local or systemic complications and usually resolves in the first week. Moderately severe acute pancreatitis is defined by the presence of transient organ failure, local complications or exacerbation of co-morbid disease. Severe acute pancreatitis is defined by persistent organ failure, that is, organ failure >48 h. Local complications are peripancreatic fluid collections, pancreatic and peripancreatic necrosis (sterile or infected), pseudocyst and walled-off necrosis (sterile or infected).

Patients who were suffering from chronic pancreatitis based on their hospital records or had radiological findings of pancreatic calcifications, dilated pancreatic duct, areas of atrophy,

and pseudo cysts, pancreatic malignancy and those not willing to participate in the study were excluded.

A detailed history (including present medical history and previous surgical morbidity/intervention was taken) and physical examination, laboratory investigations requested at the time of admission included arterial blood gas analysis, hematocrit, kidney function test, liver function test, serum electrolytes, serum amylase, serum lipase, and complete hemogram. Abdominal ultrasonography was done at the time of admission and contrast-enhanced pancreatic CT scan was done after 72 h of hospitalization.

Bedside index for severity in acute pancreatitis (BISAP) was calculated within first 24 h of admission. BISAP score is observed during the first 24 hours of admission to predict mortality before the onset of organ failure[13].

Scoring system for Bedside Index of Severity in Acute Pancreatitis (BISAP) [8,13]

Score one point for each of the following criteria:

Blood urea nitrogen level > 8.9 mmol/L

Impaired mental status

Systemic inflammatory response syndrome is present

Age > 60 yr

Pleural effusion on radiography

A score of more than three indicates an increased risk of death.

Statistical methods

The statistical analysis was done using IBM SPSS (Statistical Package for the Social Sciences) Version 20.0. Continuous variables were represented as mean \pm standard deviations at 95% confidence intervals. Categorical variables were presented as proportions. One-way analysis of variance, and Pearson Chi-squared tests were used in the univariate analysis to evaluate statistical associations. A two-sided $P < 0.05$ was considered statistically significant.

RESULTS

Majority belonged to the age group of 31-40years (49%), followed by 21- 30 years (20%), < 20 years (15%) and 41-50 years (13%). Mean age was 39.65 and range 18 – 55 years. Males

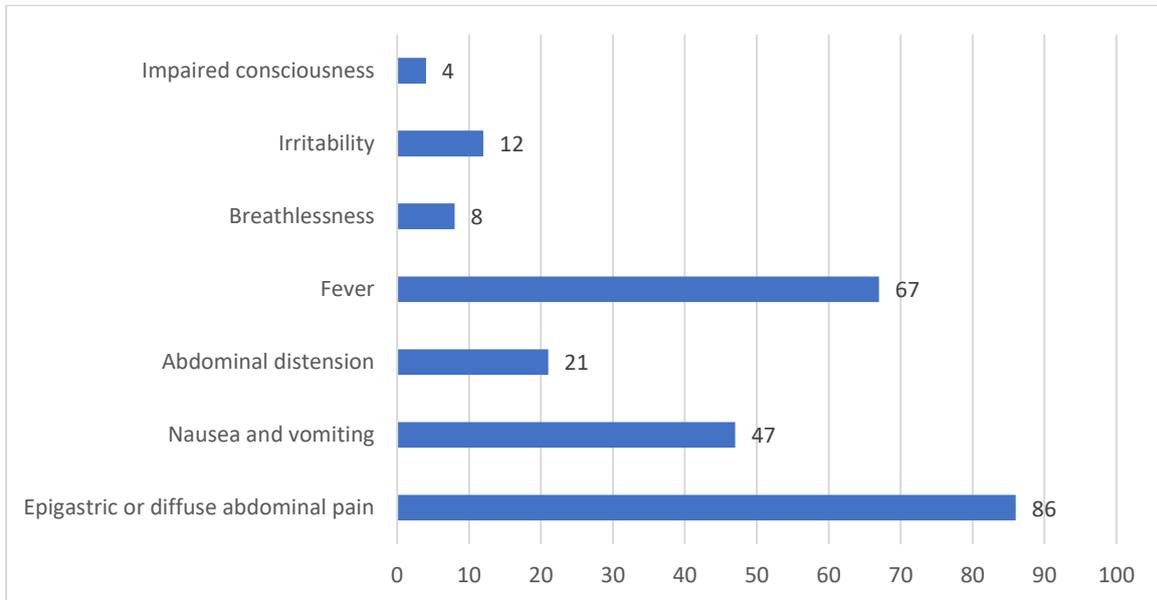
were 67% and females were 43%. Duration of hospital stay was 0 – 48hours in 42%, 48-96 hours in 16% and >96 hours in 42%. Commonest aetiology was gallstones in 44% followed by alcohol consumption in 32%. Other causes identified were hypertriglyceridemia in 10% and post ERCP 2%. Aetiology was unknown in 22%. Severity of AP was mild moderate and severe in 42%, 30% and 28% respectively. BISAP score was > 3 in 32% of patients. In hospital mortality was seen in 8% patients.(table 1)

Table 1: Distribution of patients as per variables assessed

PARAMETERS	Sub- group	Frequency	Percentage
Age in years	< 20 years	15	15
	21– 30 years	20	20
	31 - 40 years	49	49
	41- 50 years	13	13
	>50 years	3	3
Age (years) Mean±SD/ range		39.65 ± 5.3 years/ 18-55 years	
Sex	Female	43	43
	Male	57	57
Duration of hospital stay	0 – 48hours	42	42
	48-96 hours	16	16
	>96 hours	42	42
Aetiology	Gall stones	44	44
	Alcohol consumption	32	32
	Hypertriglyceridemia	10	10
	Post ERCP	2	2
	Unknown	22	22
Severity as per revised Atlanta classification	Mild Acute pancreatitis	42	42
	Moderate Acute pancreatitis	30	30
	Severe Acute pancreatitis	28	28
BISAP score	>3	32	32
	≤ 3	68	68
In hospital mortality	Yes	8	8
	No	92	92

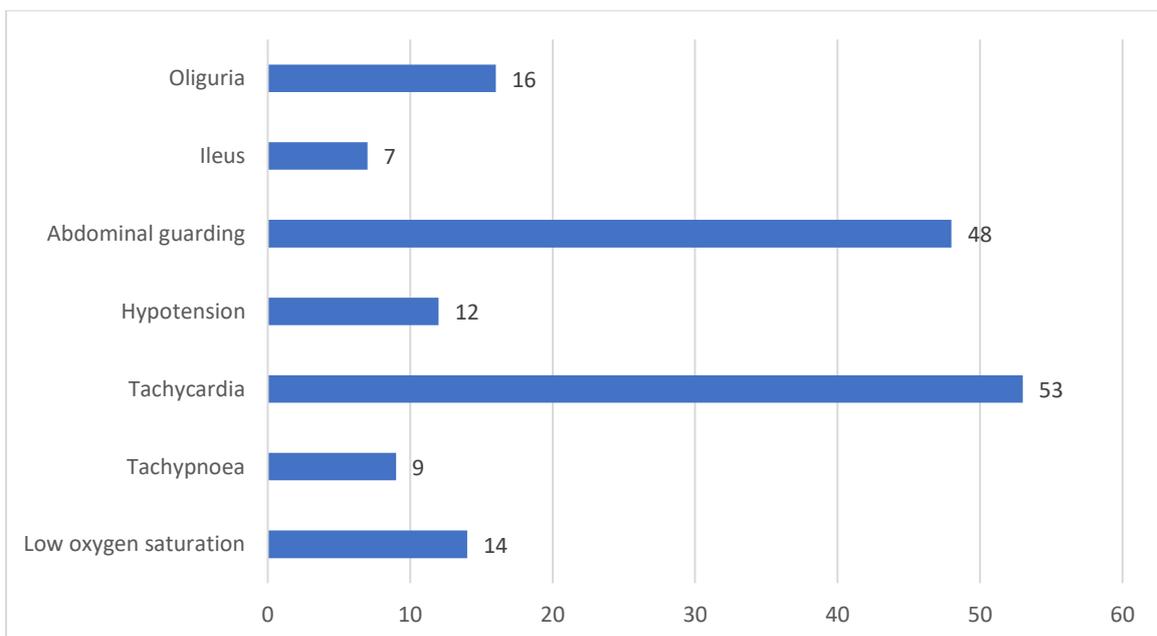
Commonest symptom was abdominal pain in 86% followed by fever in 67% and nausea vomiting in 42%. Other symptoms reported were abdominal distension (21%), irritability (12%), breathlessness (8%) and impaired consciousness (4%)(figure1)

Figure 1: Distribution of patients by symptomatology



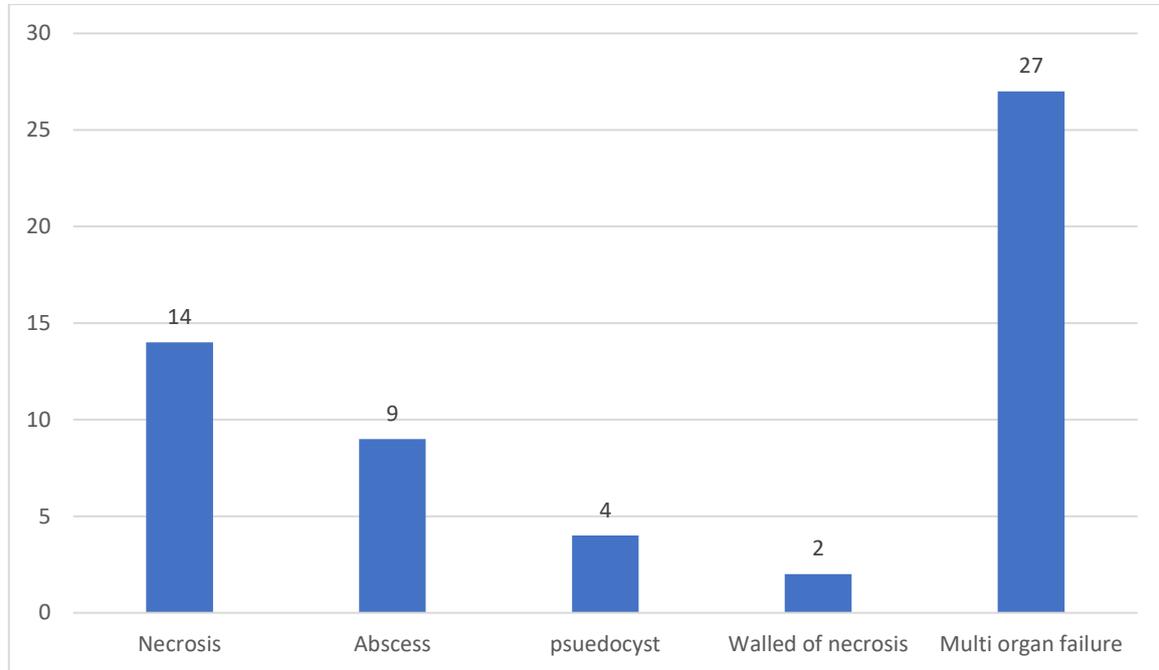
Tachycardia (53%) and abdominal guarding (48%) was the commonest clinical sign elicited followed by oliguria(16%), low oxygen saturation(14%), hypotension (12%), tachypnoea(9%) and ileus(7%). (figure2)

Figure 2: Distribution of patients by presence of clinical signs



Complications identified were necrosis, abscess, pseudocyst, walled of necrosis and multi-organ failure in 14%, 9%, 4%, 2% and 27% respectively.

Figure 3: distribution of patients by complications identified



Mean of BMI, haematocrit, serum creatinine, blood urea nitrogen and CRP increases with increasing severity of acute pancreatitis, and this difference was significant statistically. Age and gender is has no association with severity of AP. (table 2)

Table 2: Determinants of severity of acute pancreatitis

Varibales	Sub group	Mild AP (42)	Moderate AP (30)	Severe AP (28)	P Value
Mean age ± SD		41.1±6.56	37.2±5.2	45.71±11.2	P >0.05
Mean BMI ± SD		19.1±4.32	21.3±5.57	28.9±11.2	P <0.05
Gender	Female (43)	15	16	12	P >0.05
	Male (57)	27	14	16	
Mortality	Yes	0	2	6	P <0.05
	no	42	28	23	
Mean HCT in 1 st hour ± SD		33.5±12.1	37.2±4.5	49.7±19.3	P <0.05
Mean serum creatinine ± SD		0.9±1.2	3.2±1.7	10.38±12.35	P <0.05

Mean BUN ± SD	12±3.4	15.6±14.32	27.9±12.6	P <0.05
Mean CRP at admission ± SD	2.3±3.5	11±23	21±5.6	P <0.05

DISCUSSION

Acute pancreatitis (AP) is an inflammatory disease of highly variable severity, ranging from mild cases with low mortality to severe cases with high mortality.[14] Management depends on the clinical profile and appropriate categorization.

In this study out of 100 patients, majority belonged to the age group of 31-40years (49%), followed by 21- 30 years (20%), < 20 years (15%) and 41-50 years (13%). Mean age was 39.65 and range 18 – 55 years. Males were 67% and females were 43%. In study by Negi et al 123 patients were included- 89 men (72.35%) and 34 women (27.65%). Median age of presentation was 42 years [15]. A study by Patel ML et al has a total of 120 patients comprising of 88 men (73.33%) and 32 women (26.66%) were recruited. The mean age of study participant was 36.96 ± 13.44 years.[16] AP is more common in young age group.

In our study commonest aetiology was gallstones in 44% followed by alcohol consumption in 32%. Other causes identified were hypertriglyceridemia in 10% and post ERCP 2%, unknown aetiology in 22%.Whereas in study by Negi et al the major etiological groups identified were alcohol 73 cases (59.3%), gallstones 40, (35.6%); post endoscopic retrograde cholangio-pancreatography 1 (0.8%), hypertriglyceridemia 3 (2.9%), autoimmune 1 (0.8%) and idiopathic 5 cases (4%). Alcohol was the most common cause of AP, followed by gallstone [15]which was similar to study by Patel ML et al the leading etiological factors were alcohol in 85 patients (70.8%) and gallstones in 25 (20.8%). It was idiopathic 5 patients (4.1%) [16].

In our study commonest symptom was abdominal pain in 86% followed by fever 67% and nausea vomiting in 42%. In study by Negi et al most common presentation was abdominal pain followed by vomiting [15]. A study by Patel ML et al the most common presentation was abdominal pain followed by vomiting [16].

In hospital mortality was seen in 8% patients in this study. In study by Negi et al Mortality was seen in 7(5.7%) patients. Out of seven patients who died in hospital, 5(71.42%) had severe pancreatitis and 2(28.57%) patients had moderately severe pancreatitis[15]. In study

by Patel ML et al mortality was seen in three (2.5%) patients, all of which had severe pancreatitis [16].

In our study Severity of AP was mild, moderate and severe in 42%, 30% and 28% respectively. In study by Kong L, of the 268 patients with AP, 35.1% (94/268) developed SAP [17].

In our study complications identified were, necrosis, abscess, pseudocyst, walled of necrosis and multi-organ failure in 14%, 9%, 4%, 2% and 27% respectively. In study by Kong L 58 patients showed MOF [17].

Our study found that mean of BMI, haematocrit, serum creatinine, blood urea nitrogen and CRP increases with increasing severity of acute pancreatitis, and this difference was significant statistically in our study. Similarly in study by Negi et al, patients with BMI ≥ 25 , HCT $\geq 44\%$ and CRP ≥ 150 mg/l had an increased risk of developing a severe form of AP [15]. Also in study by Patel ML et al patients with body mass index (BMI) ≥ 25 kg/m², Haematocrit (HCT) $\geq 44\%$ and C-reactive protein (CRP) ≥ 150 mg/l had an increased risk of developing a severe AP [16].

In this study BISAP score was > 3 in 32% of patients. A meta-analysis by Gao W et al shows that the BISAP score ≥ 3 was significantly associated with increased risk of SAP (DOR = 18.08; 95% CI, 8.27–39.55; P < 0.05; I² = 64.2%). The pooled sensitivity was 51% (43%-60%), and the pooled specificity was 91% (89%-92%) [18].

Thus, laboratory markers and BISAP score can be used to assess prognostication in patients with acute pancreatitis which can aid in appropriate management. To be of the greatest value to clinicians, predictions of outcome should be accurately and reliably applied as early as possible, preferably during the first 24 hours of admission to hospital.

CONCLUSION

AP is commonly seen in young age men when compared to women. Commonest symptom was abdominal pain in 86% followed by fever 67% and nausea vomiting in 42%. Tachycardia(53%) and abdominal guarding(48%) was the commonest clinical sign elicited followed by oliguria(16%), low oxygen saturation(14%), hypotension (12%), tachypnoea(9%) and ileus(7%). Mean of BMI, haematocrit, serum creatinine, blood urea nitrogen and CRP increases with increasing severity of acute pancreatitis, and this difference was significant statistically in our study.

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