

ORIGINAL ARTICLE

Clinical Profile and Outcome of Acute Pancreatitis: A Hospital-Based Prospective Observational Study in Subhimalayan State

Nitesh Negi¹, Jatinder Mokta², Brij Sharma³, Rajesh Sharma⁴, Anupam Jhobta⁵, Vishal Bodh⁴, Asha Ranjan^{6*}

Abstract

Background: Prospective and population-based studies on the incidence of acute pancreatitis (AP) are lacking. We aimed to determine the incidence, etiology, severity, and outcome of AP.

Material and Methods: This was an observational prospective study done on 123 patients with AP during one year period in IGMC, Hospital Shimla. Detailed Clinical history was recorded and examination and lab investigations were done. Severity of AP was assessed using modified Atlanta classification.

Results: In this study, 123 patients were included- 89 men (72.35%) and 34 women (27.65%). Median age of presentation was 42 years. The most common presentation was abdominal pain followed by vomiting. The major etiological groups were as follows: alcohol 73 cases (59.3%), gallstones 40, (35.6%); postendoscopic 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 and followed by gallstone. 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. When compared, patients with BMI ≥ 25 , HCT $\geq 44\%$ and CRP $\geq 150\text{mg/l}$ had an increased risk of developing a severe form of AP.

Conclusions: Alcohol and gallstones were the most common etiology of AP. HCT, CRP and BMI done at admission are useful predictors of severe pancreatitis.

Introduction

Acute pancreatitis (AP) is an inflammatory process of the pancreas with varying involvement of regional tissues or remote organ systems^{1,2} and with potentially devastating consequences. The diagnosis of mild disease may be missed and death may occur before diagnosis in 10% patients with severe disease. AP runs a benign course in Asian countries and the etiology is different from that of the western population. Gall stones and alcohol abuse account for 70% of cases of AP. The risk of developing AP in patients with gallstones is greater in men, but more women develop this disorder since gallstones occur with increased frequency in women. The incidence of AP increases with age. More recently, biochemical markers, such as C-reactive protein³, interleukin-6 and trypsinogen

activation peptide,^{4,5} have been used as predictors of severity in AP. C-reactive protein is a useful marker only 48 h after the onset of acute episode³ and overall usefulness of the remaining markers is restricted by their limited availability or elevated cost. Thus, so far, no early, accessible and economical predictive marker for severe AP has yet been described. Hematocrit (Hct) is routinely assessed in every AP case at admission and is an accessible and low-cost test. Recent studies have proposed that hemoconcentration may constitute a good marker for severity of AP, but others were unable to find a significant correlation with the development of organ failure,

pancreatic necrosis or death.^{6,8} Thus, the value of hemoconcentration in the initial assessment of AP patients and its implications in prognosis remain controversial. Recently, several studies have identified obesity as a negative prognostic factor in AP.^{9,10} However, in Asian populations, morbidity and mortality also occur in patients with low body mass indexes (BMIs). In this background, the present study was undertaken to study the etiology, clinical profile, severity and outcome of AP in Hilly State.

Material and Methods

This was a prospective observational study done in the department of Medicine and Gastroenterology, IGMC Shimla during one year period from 1st July 2014 to 30th June 2015. All the patients above 18 years of age presenting in inpatient department with AP (2 of the 3 criteria- abdominal pain suggestive of AP, serum amylase or lipase activity $>3\text{UNL}$, characteristic radiological findings) were included in the study. Patients with chronic pancreatitis (history of chronic abdominal pain/ maldigestion with weight loss/ radiological evidence of chronic pancreatitis) and immunocompromised patients were excluded. Institutional ethical clearance and written informed consent was obtained from the patients. Detailed history and clinical examination was done and laboratory tests performed included haemogram, serum amylase, lipase, liver function tests, serum triglyceride, blood urea nitrogen, serum creatinine, blood glucose, lactate dehydrogenase, serum calcium, arterial blood gas analysis. All cases were

¹Junior Resident, Deptt. of Medicine; ²Professor, Deptt. of Medicine; ³Associate Professor, Deptt. of Gastroenterology; ⁴Assistant Professor, Deptt. of Gastroenterology; ⁵Professor, Deptt. of Radiology; ⁶Senior Resident, Deptt. of Medicine, IGMC, Shimla, Himachal Pradesh; *Corresponding Author

Received: 06.07.2016; Revised: 23.06.2017; Accepted: 30.06.2017

Table 1: Baseline profile of patients with acute pancreatitis (AP)

	Total n=123	Male n= 89	Female n=34
Age range (yrs) Mean	42.89 ± 12.53	41.20	46.82
18-40	54 (43.9%)	41 (46.06%)	13 (38.23%)
41-60	58 (47.15%)	41 (46.06%)	17 (50%)
≥61	11 (8.94%)	7 (7.89%)	4 (11.76%)
Rural	64 (52%)	42 (47.19%)	22 (67.70%)
Urban	59 (48%)	47 (52.8%)	12 (35.29%)
Presenting symptoms/signs			
Pain in abdomen	123 (100%)	89 (100%)	34 (100%)
Abd. tenderness	123 (100%)	89 (100%)	34 (100%)
Vomiting	52 (42.27%)	40 (44.94%)	12 (35.29%)
Fever	14 (11.38%)	12 (13.48%)	2 (5.88%)
Jaundice	7 (5.69%)	3 (3.37%)	4 (11.76%)
Hypoxia	31 (25.20%)	21 (23.53%)	10 (29.41%)
PLEF	26 (21.13%)	18 (20.22%)	8 (23.53%)
Ascitis	28 (22.76%)	18 (20.22%)	10 (29.41%)
Average BMI (Kg/m ²)	24.49 ± 2.6		
Lab parameters (mean ± SD)			
HCT mm/hr	40.35 ± 0.67		
CRP (mg/dl)	94.75 ± 82.39		
SGPT (IU)	90.24 ± 116.6		
SGOT (IU)	72.34 ± 98.6		
S. bilirubin total	3.03 ± 4.37		
Conjugated (mg/dl)	1.3 ± 2.78		
S. amylase (IU)	607.6 ± 540.1		
S. lipase (IU)	388.7 ± 270.8		
Modified CT severity index (n=67)			
Mild	20 (29.85%)		
Moderate	27 (40.29%)		
Severe	22 (32.83%)		
Duration of hospital stay (days)			
Average	8.03 ± 4.98		
Mild AP	4.89		
Mod severe AP	8.98		
Severe AP	11.6		
Severity			
Mild AP	46 (37.40%)	36 (40.44%)	10 (29.41%)
Mod severe AP	49 (39.84%)	33 (37.03%)	16 (47.05%)
Severe AP	28 (22.76%)	20 (22.47%)	8 (23.53%)
Etiology			
Alcohol	73 (59.35%)	69 (77.52%)	4 (11.76%)
Gall stone	40 (32.52%)	15 (16.85%)	25 (73.52%)
Idiopathic	5 (4%)	2 (2.24%)	3 (8.82%)
Hypertriglyceridemia	3 (2.44%)	2 (2.24%)	1 (2.94%)
Post-ERCP	1 (0.81%)	0	1 (2.94%)
Autoimmune	1 (0.81%)	1 (1.12%)	0
Outcome			
Improved	116 (94.30%)	84 (94.38%)	32 (94.11%)
Death	7 (5.70%)	5 (5.61%)	2 (5.88%)

subjected to ultrasound study of abdomen within first 48 hours of presentation and CT after 3-5 days in patients with moderate to severe pancreatitis. Organ failure score were calculated using Marshall scoring system. Severity of AP was assessed on bases of modified Atlanta classification, BMI, Hct, CRP and contrast enhanced CT findings. All the patients were managed as per standard guidelines.

Results

A total of 123 patients with acute abdomen who were diagnosed as AP based on elevated serum amylase and/or lipase levels and radiological findings with ultrasound and CT abdomen were included in the study.

in Table 1. Ascitis and pleural effusion was seen in 24 and 20 patients in severe pancreatitis and in 4 and 6 patients in moderately severe group respectively and none in mild pancreatitis group. Alcohol was the most common cause of acute pancreatitis in 73 (59.34%) patients, followed by gallstone in 40 (32.52%) patients. The overall mean length of hospital stay was 8.033±4.985 days. 73 (59.34%) patients had hospital stay of less than one week and 50 (40.6%) patients had hospital stay of ≥1 wk. In severe AP the mean length of stay was 11.60 days as compared to 8.98 and 4.89 days in moderately severe and mild pancreatitis respectively. CT abdomen was done in 67 (54.47%) patients of moderately severe (44) and

Table 2: Comparison of various parameters with severity in patients of acute pancreatitis (AP)

Parameter	Mild AP (n=46)	Mod severe AP (n=49)	Severe AP (n=28)
Pain abdomen	46 (100%)	49 (100%)	28 (100%)
Vomiting	8 (17.39%)	26 (53.06%)	18 (64.28%)
Fever	2 (4.34%)	7 (14.28%)	5 (17.85%)
Jaundice	0	5 (10.2%)	2 (7.14%)
Pleural effusion	0	6 (12.24%)	20 (71.42%)
Ascites	0	4 (8.16%)	24 (85.71%)
Hypoxia	0	39 (79.59%)	28 (100%)
CRP >150 mg/dl	1 (2.17%)	5 (10.20%)	19 (67.85%)
HCT >44 mm 1st hr	4 (8.69%)	10 (20.40%)	19 (67.85%)
BMI >25 Kg/m ²	10 (21.74%)	17 (34.69%)	14 (50%)
Outcome			
Recovered	46 (100%)	47 (95.91%)	23 (82.14%)
Dead		2 (4.08%)	5 (17.85%)
Hospital stay			
<1 week	40 (86.95%)	26 (53.06%)	7 (25%)
≥1 week	6 (13.04%)	23 (46.93%)	21 (75%)

The study included 89 (72.35%) male patients and 34 (27.65%) female patients and male to female ratio was 2.6:1. The age of patients ranged between 18 to 81 years. The mean age was 42.89 ± 12.53 years. Maximum numbers of patients were seen in the age group between 41 - 60 (47.15%) years. Baseline parameters, clinical signs and symptoms, etiological profile, severity, outcome has been tabulated

Table 3: Comparison of BMI, hematocrit and CRP at admission in determining the severity of AP

	BMI	HCT	CRP
Sensitivity	50%	67.86%	67.86%
Specificity	71.8%	82.26%	93.67%
Positive predictive value	34.14%	57.57%	76%
Negative predictive value	82.92%	90%	90.81%

severe (23) of AP. Out of 67 patients, 20 (29.85%) had mild, 27 (40.29%) moderate and 22 (32.83%) had severe pancreatitis findings. Out of total 123 patients, 116 (94.3%) patients recovered and 7 (5.6%) patients died. Out of seven patients who died in hospital, 5 (71.42%) patients had severe pancreatitis and 2 (28.57%) patients had moderate pancreatitis. On comparison of the BMI, HCT, CRP at admission in determining the severity of AP, it was found that HCT and CRP are relatively favourable measures of severity of AP (Tables 2 and 3).

Discussion

AP is a common emergency, accounting for 3% of all patients admitted with acute pain abdomen. The spectrum of the disease is wide ranging from mild attacks with mild epigastric discomfort to multi-organ dysfunction and death. The mild attacks often go undiagnosed predisposing to a severe second attack. Although the overall mortality of AP is static at 1 to 2% but in severe acute pancreatitis mortality is 10 to 30%.

Ours was a hospital based prospective study of 123 patients. The mean age of patients was 42.89±12.53 years. There was considerable variation

in the age distribution of the study population. Majority of the patients in our study were in the age group of 41-60 years (47.15%) followed by patients between 18 to 40 years (43.91%) and 11 (8.94%) patients were above 60 years of age. Alcohol consumption is more common in middle age males as compared to other age groups, it could explain the preponderance of middle age in our study. This is comparable to the studies done by W.Uhl¹¹ and Raghu M G et al,¹² where it was 50 years & 42.9±15.9 years respectively. In our study, males outnumbered females and the male to female ratio was 2.6:1. This is comparable with the studies of W.Uhl¹¹ of 302 patients, with a male to female ratio of 1.85:1 and A C de Beaux et al,¹³ where male to female ratio was 1:6.1. Alcohol consumption being more common in male compare to female in this hilly state, it could be explained the male preponderance in our study. Pain abdomen was the most common presenting complaint in all patients (100%). The presentation in our study correlates with studies by Mitchell S¹⁴ and Rao B S et al,¹⁵ where it was seen in 95 % and 100% of cases respectively. Vomiting was seen in 42.27%, fever and pleural effusion were seen in 11.38% and 21.13% patients respectively. It correlates with study by Rao B S et al.¹⁵ Alcohol was the commonest cause of pancreatitis (59.34%) followed by gall stone pancreatitis (32.52%). Baig S.J. et al,¹ in their study of aetiology of AP in eastern India found alcohol as a major etiology being responsible for around 41.1% and 18.1% in mild and severe acute pancreatitis respectively. In a study by S Macro et al,¹⁶ the most common etiology was alcohol consumption (39.3%) followed by gallstones (24.1%). High prevalence of alcohol consumption and gall stone disease among general population in this hilly state could explain the higher prevalence of alcohol and gall stones induced pancreatitis in our study. Out of total 123 patients, 116 patients recovered and 7 patients died. So overall mortality in our study is 5.7 %. Out of 7 patients who died, 5 had severe pancreatitis and 2 had moderate pancreatitis. Hence the overall mortality in severe pancreatitis in our study is 17.85% and in moderately severe pancreatitis is 4.08%. It correlates with study by Bota S et al,¹⁷ where overall mortality rate was 4.6%. In our study fifty percent of the patients with severe

pancreatitis had BMI of ≥ 25 kg/m², while 28.42 % of patients with mild to moderate pancreatitis had BMI of ≥ 25 kg/m². The sensitivity, specificity, positive predictive value and negative predictive value of BMI ≥ 25 kg/m² in predicting acute severe pancreatitis at admission was 50%, 71%, 34.14% and 82.9% respectively. Statistical analysis of the data yielded a p value of <0.03 . Our study is comparable to other studies for obesity as a risk factor for severe AP. In a study by Su Mei CHEN et al¹⁸, In all their 12 clinical studies with a total of 1483 patients were included in the analysis. They found that obese patients (BMI ≥ 25) had a significantly increased risk of severe AP compared with non-obese patients.

In our study the evaluation of serum HCT level at admission for the detection of severity of AP showed the sensitivity, specificity, positive predictive value and negative predictive value was 67.86%, 85.26%, 57.57%, 90% and 81.30% respectively & the values were found to be statistically significant (p=0.00). Brown et al,¹⁹ in their study in 128 patients found that the test at admission had a sensitivity, specificity, positive predictive value and negative predictive value of 72%, 83%, 68% and 85% respectively. In our study the evaluation of serum CRP level at admission for the detection of severity of AP showed a sensitivity, specificity, positive predictive value, negative predictive value and accuracy of 67.86%, 93.67%, 76%, 90.8% and 87.80% respectively. This test at admission was statistically significant (p=0.00). Which is comparable with a study by Anna Gurda-Duda et al²⁰ and Pongprasobchai et al.²¹ The limitation of study was serum HCT and serum CRP were done only at baseline and it is a single centre study in tertiary care centre, which may lead to referral bias. Despite the limitation, the study provides an insight into the validity of the different prognostic indicators in the assessment of severity of AP. However, based on the study, it is safe to conclude that BMI, serum CRP and HCT can be used to assess the severity of pancreatitis at admission.

Conclusion

AP is a common cause of acute abdomen and alcohol and gallstone are the most common aetiology. Most of the patients were adult males with majority present with mild to moderately severe

pancreatitis with low mortality and morbidity and 22.76% patients present as severe pancreatitis with organ failure leading to higher mortality and morbidity. HCT, CRP and BMI done at admission are useful predictors of severe pancreatitis.

References

- Baig SJ, Rahed A, Sanjay Sen. A Prospective study of the aetiology, severity and outcome of acute pancreatitis in Eastern India: *Tropical Gastroenterology* 2008; 29:20-22.
- Garg PK, Khanna S, Bohidar NP. Incidence, spectrum and antibiotic sensitivity pattern of bacterial infections among patients with acute pancreatitis. *J Gastroenterol. Hepatol* 2001; 16:1055-9.
- Chen CC, Wang SS, Lee FY, et al. Proinflammatory cytokines in early assessment of the prognosis of acute pancreatitis. *Am J Gastroenterol* 1999; 94:213-218.
- Neoptolemos JP, Kemppainen EA, Mayer JM, et al. Early prediction of severity in acute pancreatitis by urinary trypsinogen activation peptide: a multicentre study. *Lancet* 2000; 355:1955-1960.
- Khan Z, Vlody J, Horovitz J, et al. Urinary trypsinogen activation peptide is more accurate than hematocrit in determining severity in patients with acute pancreatitis: a prospective study. *Am J Gastroenterol* 2002; 97:1973-1977.
- Baillargeon JD, Orav J, Ramagopal V, et al. Hemoconcentration as an early risk factor for necrotizing pancreatitis. *Am J Gastroenterol* 1998; 93:2130-2134.
- Brown A, Orav J, Banks PA. Hemoconcentration is an early marker for organ failure and necrotizing pancreatitis. *Pancreas* 2000; 20:367-372.
- Lankisch PG, Mahlke R, Blum T, et al. Hemoconcentration: an early marker of severe and/or necrotizing pancreatitis? A critical appraisal. *Am J Gastroenterol* 2001; 96:2081-2085.
- Funnell IC, Bornman PC, Weakley SP, et al. Obesity: an important prognostic factor in acute pancreatitis. *Br J Surg* 1993; 80:484-486.
- Martínez J, Johnson CD, Sánchez-Payá J, et al. Obesity is a definitive risk factor of severity and mortality in acute pancreatitis: an updated meta-analysis. *Pancreatology* 2006; 6:206-209.
- Uhl W. A randomized double blind, multi-centric trial of octreotide in moderate to severe acute pancreatitis. *Gut* 1999; 45:97-104.
- Raghu M G. Lung Complications in Acute Pancreatitis. *J Pancreas* 2007; 8:177-185.
- De Beaux AC. Factors influencing morbidity and mortality in acute pancreatitis. *Gut* 1995; 37:121-126.
- Mitchell S. Acute pancreatitis: etiology, clinical presentation, diagnosis, and therapy. *Med Clin N Am* 2008; 92:889-923.
- Rao S. Etiology, clinical profile, severity and outcome of acute pancreatitis in relation to bedside index for severity of acute pancreatitis BISAP and CT severity index (CTSI) scores. *Int J Med Res Health Sci* 2014; 3:922-928.
- Macro S. Predicting Acute Pancreatitis Severity: Comparison of Prognostic Scores. *Gastroenterology Research* 2011; 4:216.
- Bota S. Predictive factors for severe evolution in acute pancreatitis and a new score for predicting a severe outcome. *Ann Gastroenterol* 2013; 26:156-162.
- Chen SM, Xiong GS, Wu SM. Is obesity an indicator of complications and mortality in acute pancreatitis? An updated meta-analysis. *J Digest Dis* 2012; 13:244-251
- Brown A, Orav J, Banks PA. Hemoconcentration is an early marker for organ failure and necrotizing pancreatitis. *Pancreas* 2000; 20:367-372.
- Gurda-Duda A, Kus nierz-Cabala B, Nowak W, et al. Assessment of the Prognostic Value of certain acute phase proteins and procalcitonin in the Prognosis of Acute Pancreatitis. *Pancreas* 2008; 37:448-453.
- Pongprasobchai S. Erythrocyte sedimentation rate and C - reactive protein for the prediction of severity of acute pancreatitis. *Pancreas* 2010; 39:1226-1230.