Evalution of Etiological and High Risk Factors in the Patients of Acute Pancreatitis

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ABSTRACT

Introduction: Acute pancreatitis presents a heavy financial burden on the health care system and significant physiologic stress on the patient. In view of this, the present study was carried out to identify etiological factors and high risk factors in the patients of acute pancreatitis.

Material and Methods: The present retrospective study comprised of thirty patients of acute pancreatitis having specific complaints of pain in upper abdomen with or without radiation to back, nausea, vomiting, abdominal distension etc. with characteristic history of alcoholism, family history etc. The recorded clinical parameters were used to get SIRS criteria within the first 24 hours of admission. The SIRS diagnostic criteria were applied to the recorded clinical parameters within the first 24 hours of the admission.

Results: Etiology was idiopathic in 50% (n=15) while cholelithiasis 26.67% (n=8) and alcoholism 23.34% (n=7) stood next in order. Both underweight and obese patients had protracted disease course; with 100% (n=4) unfavourable outcome in underweight and obese class-II/III patients. Significant disease severity was found in patients with high BMI as findings suggested that mean BMI for mild disease was 24.3 kg/m^2 and for severe disease it was 30.15 kg/m^2. Mortality was also higher in obese class of group; with 100% (n=3) mortality.

Conclusion: Obesity can significantly alter the disease process. In this group of patients intensified management is needed. Complications are also expected in this group of patients. Development of positive SIRS response (presence of ≥3 positive SIRS diagnostic criteria) on first day of admission can precisely predict the disease severity and thus, unfavourable outcome. This can definitely guide clinician early in clinical phase for targeted management of the affected patient. Need of high dependency care in such patients should be promptly decided so that mortality can be reduced.

Keywords: Acute pancreatitis; Cholelithiasis; Obesity

INTRODUCTION

Acute pancreatitis is a reversible inflammatory process of the pancreas. Even though the disease process may be confined to pancreatic tissue, it can also affect peripancreatic tissues or more distant organ sites.[1] The increased frequency of acute pancreatitis may be due to the rising incidence of obesity, a risk factor for the development of gallstones and, by extension, gallstone pancreatitis. Acute pancreatitis presents a heavy financial burden on the health care system and significant physiologic stress on the patient.[2] In view of this, the present study was carried out to identify etiological factors and high risk factors in the patients of acute pancreatitis.

MATERIAL AND METHODS

The present retrospective study of thirty patients of acute pancreatitis has been carried out in a tertiary care hospital attached to Medical College between 2012 and 2014. Patients of all age group and both the sexes with first episode of acute pancreatitis were included in this study. Known or previously admitted patients of acute pancreatitis coming with relapse or recurrence were excluded from the study. Diagnosed case of chronic pancreatitis was excluded.

Patient clinically seeming to be affected with acute pancreatitis having specific complaints of pain in upper abdomen with or without radiation to back, nausea, vomiting, abdominal distension etc. with characteristic history of alcoholism, family history etc. have been admitted to surgery ward. Epidemiological data, clinical exam records, investigations, and other relevant data of the thirty randomly selected patients were recorded in the proforma and these parameters were then used individually or in a defined scoring system to confirm the diagnosis and to assess the progression of the disease in terms of favourable or unfavourable outcome. In this study, favourable outcome is ascribed to survivors without ICU admission or need of surgery and unfavourable outcome is ascribed to nonsurvivors, patient undergoing surgery for local complications and ICU admission. We classified BMI (Body Mass Index) into 5 categories; (underweight [BMI, <18.5kg/m2], normal range [18.5-24.9 kg/m2], pre-obese [25-29.9 kg/m2], obese class I [30-34.9 kg/m2], and obese class II/III [>35 kg/m2]) and the relationship of BMI and severity of the disease and to favourable and unfavourable outcome was done.

Patients presenting with respiratory rate more than 20 per minute and/or chest auscultation suggestive of any abnormal finding i.e. creps, decreased air entry etc., were defined as having respiratory distress. The association of respiratory distress and disease severity and outcome was correlated in study. Association between respiratory distress and necrosis has been assessed.

The recorded clinical parameters were used to get SIRS criteria (systemic inflammatory response syndrome) within the first 24 hours of admission. The SIRS diagnostic criteria were applied to the recorded clinical parameters within the first 24 hours of the admission. Positive SIRS response was attributed to the 3 or more than 3 positive SIRS diagnostic criteria.

SIRS diagnostic criteria

1   TEMP > 38^{0}C or < 36 ^{0}C

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2   Respiratory rate >20/min or PaCO$_2$ < 32 torr
3   Heart rate > 90/min
4   Total leukocyte count > 12000 /mm^3, < 4000/mm^3 or > 10 % immature band forms.

RESULTS

In this study; out of 30 patients, 10 (33%) patients were in 1-30 year age group, 10 (33%) patients in 31-50 year age group, 9 (30%) patients in 51-70 year age group, and one (4%) patient was of more than 70 years. Two patients were in their extremes of age of which one was 2 years old and the other was 84 years old. Out of these 30 patients, 14 (46%) were females and 15 (50%) were adult male while one (4%) was male child. Of which four females and six males were of 1-30 year age group. Three females and seven males were of 31-50 year age group. Six females and three males were of 51-70 year age group while one female aged more than 70 years (table-1).

Out of the 30 patients clinical data were evaluated and found that all (100%) presented with pain in abdomen. Fever was present in 4(14%) patients. Nausea-vomiting was present in 22(73%) patients. Abdominal distension was present in 15 patients.

Four (14%) patients presented with constipation, anorexia was present in 18 (60%) patients. Significant breathlessness was present in 5(17%) patients (table-2).
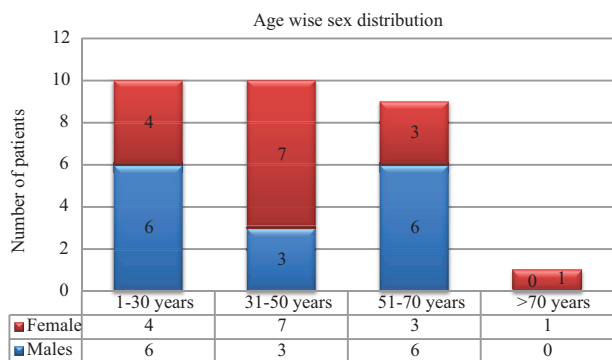
Among these patients, 15 (50%) presented within first day of onset of pain,7 (23%) had history of pain past two days, 5 (17%) had complaints past three days and 3 (10%) had presented with complaints past 4 days (table-4). 11 (36%) patients had severe agonizing pain, 16 (53%) had dull aching pain of moderate to severe intensity, 2 (7%) had colicky pain and 1(4%) had burning type of pain.

This pain was present in epigastric region in 13 (43%) patients, periumbilical site in 2(7%) patients, both epigastric and periumbilical site in 7 (23%) patients, right hypochondrium and epigastric region in 2 (7%) patients, left hypochondrium and epigastric region in 2 (7%) patients, whole upper abdomen in 1 (3%) patient and in left hypochondrium in 1 (3.3%) patient, hypogastric in 1(3.3%) patient, epigastric, periumbilical and right hypochondrium in 1(3.3%) patient (table-3).
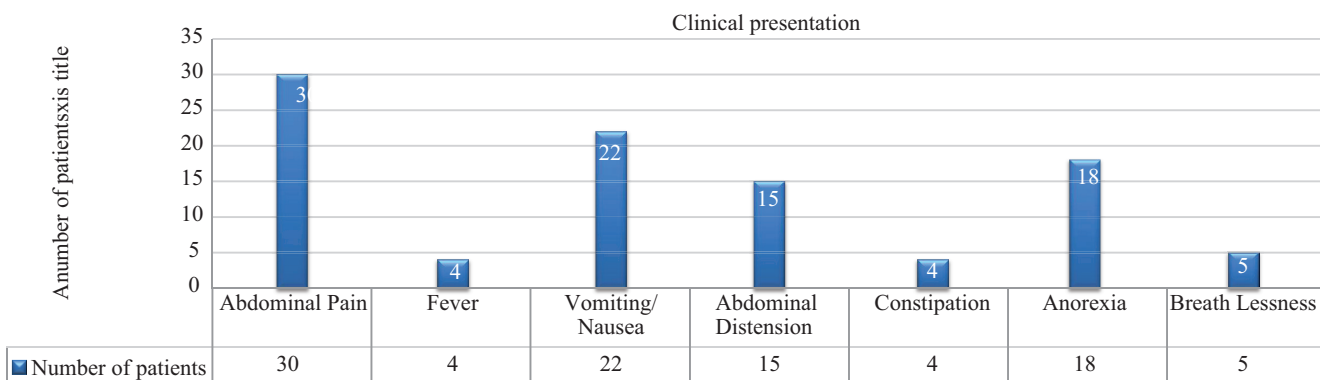
In 9 (30%) patients pain was radiating to back, in 6 (20%) it was radiating to all abdomen, in 3 (15%) it was radiating to periumbilical region. In one (2%) patient each it was radiating to periumbilical and bilateral flank simultaneously and to bilateral flank and bilateral hypochondrium simultaneously in other. In 10 (33%) patients it was non radiating type (table-4).

Pain was aggravated by taking food in 16(53%) patients, by taking food and being in supine position in 11(37%) patients, not aggravated by any factors in 3(10%) patients (table-8). It was relieved by fasting in 9(30%) patients, being in sitting posture in 7(23%)patients, by fasting and being in sitting position simultaneously in 5 (17%) patients and not relieved by any measures in 9(30%) patients.
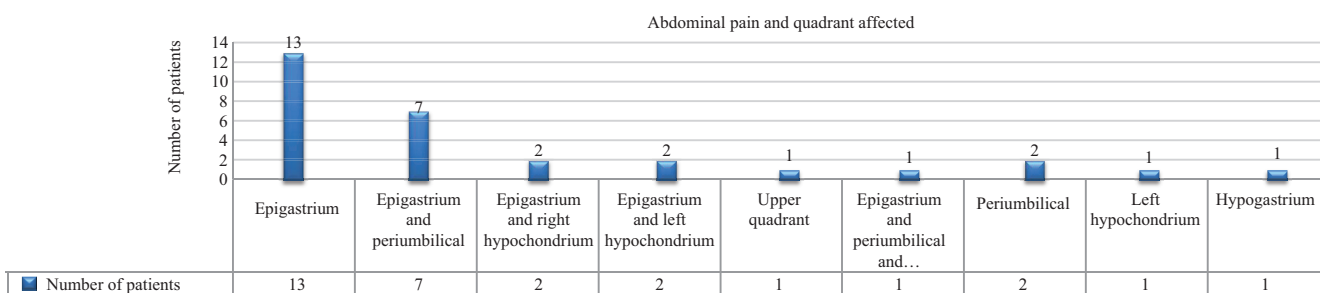
Among 22 patients in whom vomiting was present, vomitus containing clear liquids was present in 7 patients, food particles in 12 patients, bilious in 3 patients.
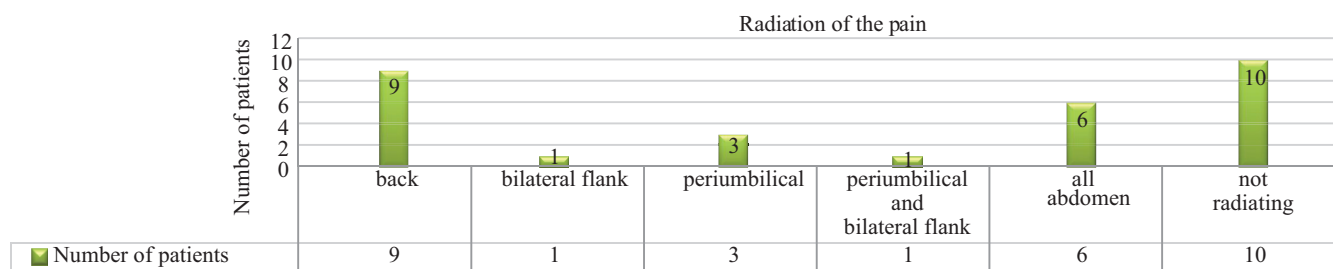

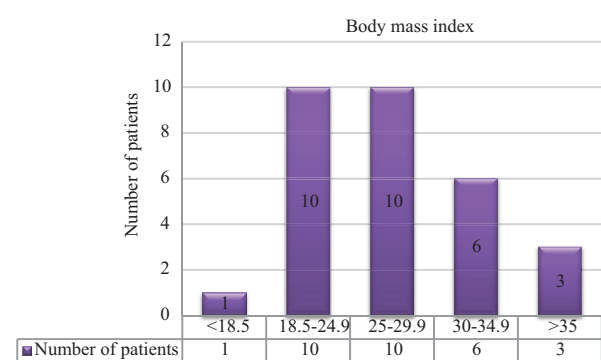**Graph-1:** Age wise sex distribution of patients

	1-30 years	31-50 years	51-70 years	>70 years
Female	4	7	3	1
Males	6	3	6	0

Graph-2: Clinical presentation of patients

	Abdominal Pain	Fever	Vomiting/ Nausea	Abdominal Distension	Constipation	Anorexia	Breath Lessness
Number of patients	30	4	22	15	4	18	5

Graph-3: Distribution of patients according to abdominal pain and affected quadrant

	Epigastrium	Epigastrium and periumbilical	Epigastrium and right hypochondrium	Epigastrium and left hypochondrium	Upper quadrant	Epigastrium and periumbilical and…	Periumbilical	Left hypochondrium	Hypogastrium
Number of patients	13	7	2	2	1	1	2	1	1

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Graph-4: Distribution of patients according to radiation of pain

	back	bilateral flank	periumbilical	periumbilical and bilateral flank	all abdomen	not radiating
Number of patients	9	1	3	1	6	10

Graph-7: Body Mass Index

	<18.5	18.5-24.9	25-29.9	30-34.9	>35
Number of patients	1	10	10	6	3

Comorbid condition	Number of patient		
	Male	Female	Total
Hypertension (23%)	2 (7%)	5 (16%)	7 (23%)
Diabetes mellitus (3.3%)	1 (3.3%)	0	1 (3.3%)
Hypertension and diabetes mellitus(3.3%)	1 (3.3%)	0	1 (3.3%)
Jaundice (3.3%)	1 (3.3%)	0	1 (3.3%)
Convulsion (3.3%)	1 (3.3%)	0	1 (3.3%)
Hypothyroidism (3.3%)	0	1 (3.3%)	1 (3.3%)
Table-5: Distribution of patients according to comorbid conditions			

Positive general examination findings	Number of patients
Pallor	15 (50%)
Icterus	2 (7%)
Bilateral pedal edema	2 (7%)
	Total= 19
Table-6: Positive general examination findings	

Per abdominal inspection		Number of patient	Total
Contour	Globular	13 (43%)	30 (100%)
	Scaphoid	9 (30%)	
	Distended	8 (27%)	
Limitation of respiratory movement	Present	5 (17%)	30 (100%)
	Not present	25 (83%)	
Per abdominal palpation		**Number of patients**	**Total**
Local temperature	Elevated	4 (13%)	30 (100%)
	Normal	26 (87%)	
Tenderness	Present	30 (100%)	30 (100%)
Gurading	Present	30 (100%)	30 (100%)
Rigidity	Present	13 (43%)	30 (100%)
	Not present	17 (57%)	
Organomegaly/ lump	Not present	30 (100%)	30 (100%)
Table-8: abdominal examination			

Out of these patients, 7 (23%) patients were known case of hypertension, 1 (3.3%) was known case of diabetes mellitus while one patient was suffering both from diabetes mellitus and hypertension. In the study one (3.3%) patient had hypothyroidism, one (3.3%) had history of jaundice and one (3.3%) had history of convulsion for he was under the treatment (table-5).

Detailed personal history assessment lead us to identification of 7 (23%) chronic alcoholic patients out of which 2 were chronic tobacco chewer and one was chronic smoker.3 patients were chronic bidi smoker and 4 were chronic tobacco chewer. Out of 7 hypertensive patient one was smoker, 1 diabetic patient was chronic alcoholic and 1 diabetic and hypertensive patient was chronic smoker as well as chronic alcoholic (table-12).

Of the thirty patients on arrival clinical parameters were recorded and evaluated; it was found that temperature was normal in 22 patients, more than 37.1°C in 7 patients and lower than 36°C in 1 patient. Pulse was more than 110/min 13 patients, 90-120/min in 12 and less than 90/min in 5 patients. Respiratory rate was more than 20/min in 16 patients, between 18 to 20 in 8 and 12-18 /min in 6 patients

Fifteen (50%) patients had pallor, two (7%) had icterus and two (7%) had bilateral pedal edema (table-6).

On measuring Body Mass Index (table-7) it was found that; 1 (3.3%) patient had BMI less than 18.5kg/m2 (underweight), 10 (33.33%) patients had BMI ranging 18.5-24.9 kg/m2 (normal), 10 (33.33%) patients were preobese with BMI 25-29.9 kg/m2, 6 (20%) patients had BMI between 30-34.9(class 1 obesity), and 3 (10%) were in obese class 2/3 with BMI ranging >35 kg/m2.

On systemic examination respiratory complications were found in 16 patients with 9 patients having lower zone creps, 5 patients having bilateral lower zone reduced air entry, one had right lower zone creps and one had left lower zone creps. Both cardiovascular and central nervous system examinations were near normal in every patient on arrival.

On per abdominal inspection (table-8); 13 had globular, 9 had scaphoid and 8 had distended abdominal contour. Limitation of respiratory movement was present in 5 patients.On palpation; in 4 cases local temperature was raised, in all patients, tenderness and rigidity was present; and in only 13 patients guarding was present. In all patients, organomegaly was absent.

On percussion in 5 (17%) patients, tympanic sound was present in periumbilical region; while fluid thrill with dull node was present in one (3.3%) patient.

On auscultation; in 5 (17%) patients bowel sound was sluggish, in 4 (13%) patients bowel sound was not heard and in rest 21 (70%) patients it was present normally. At time of presentation,

clinical diagnosis of acute pancreatitis was kept in 15 patients and was not in the other 15 patients.

On laboratory investigation, leukocytosis (total leukocyte count> 11000/mm³) was present in 17 (57%) patients, in one (3%) patient it was below 4000/mm³, and in 12 (40%) patients it was within normal range; between 4000-11000/mm³.

Clinical course of all thirty patients (table-9) was observed very carefully. Assessment of SIRS criteria in the first 24 hours of the admission, lead us to the observation that 9 (30%) patients had single positive SIRS criteria, 8 (27%) patients had two positive SIRS criteria while 9 (30%) had three positive SIRS criteria and 4 (13%) had all four SIRS positive criteria.

DISCUSSION

Acute pancreatitis is the most common disease of the pancreas, and is a significant cause of morbidity and mortality in patients admitted with abdominal pain. The etiology varies among countries. Bile stones and alcohol remain the main causes, accounting for about 70% of cases. The etiology is reported as unknown in 10%-20%, which is unfortunate, because patients with this illness are at risk of new attacks.[3]

In this study out of 30 patients, male were 53% (n=16), females were 47% (n=14) with mean age of the study group was 41 years. For male patients, mean age was 38 years and for females, it was 46 years. Table-10 describes comparison of sex wise age distribution with various studies.

In this study 13 patients (43.34%) had mild, 8 patients (26.67%) had moderate and severe disease each. One patient (3.33%) had critical disease.

On determining severity; for mild disease mean age was 31 years, for moderate disease it was 48 years, for severe disease it was 49 years and one patient had critical disease aged 35 years. For unfavourable outcome mean age was 52 years excluding one patient aged 2 years. And for favourable outcome mean age was 38 years. Patients who had expired had mean age of 62 years. Garcea G et al,[7] reported that mean age of unfavourable outcome was 66 years and mean age of favourable outcome was 55 years. On sex wise severity distribution it was found, 62% (n=10) males had favourable and 71% (n=10) females had

favourable outcome.

Middle aged (>45 years) patients, more so females with high BMI (>25kg/m2) have more profound disease course. Patients with BMI >30 kg/m2 have more severe disease course and more chances of unfavourable outcome and mortality. Obesity thus can significantly alter the disease process. In this group of patients, intensified management is needed. Complications are also expected in this group of patients. Taguchi Met al[8] reported underweight or overweight was the independent risk factor for mortality in acute pancreatitis.
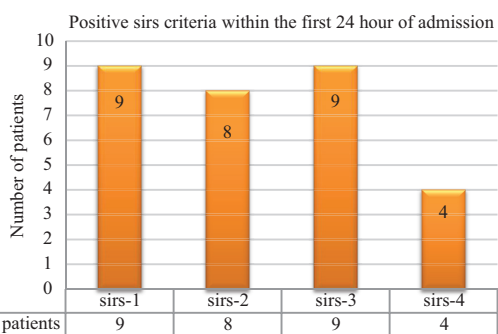
On etiological factor evaluation, alcohol induced pancreatitis was present in exclusively male patients and in our study biliary diseases were present in female patients. For cholelithiasis induced pancreatitis, mean age of presentation was 45 years and alcohol induced pancreatitis, it was 40 years. In our study, most common etiology is unknown/idiopathic comprising 50% (n=15), cholelithiasis induced with 26.67% (n=8) is second common and alcohol induced with 23.34% (n=7) as a third common. Khanna AK et al[6] reported cholelithiasis as most common etiology followed by alcohol and unknown/idiopathic cause.

On systemic examination, 16 (53%) patients had some positive respiratory finding i.e. hypoxemia, respiratory rate >20/min, auscultatory respiratory examination; indicating underlying systemic complication of the disease, 8 (50%) had developed severe disease, 6 (38%) had developed moderate disease, one (6%) had critical and one (6%) had mild disease. Among four deaths including one in postoperative patient, all were suffering from significant respiratory distress for which appropriate measures were ensued. Out of these 16 patients, 13 (81%) underwent CECT scan and it was found that 4 (30%) had edematous pancreatitis, 9 (70%) had necrotizing pancreatitis. Browne et al[9], and Jacobs et al[10] also reported respiratory distress as a systemic cause.

In this study, among 13 (43%) patients who had ≥3 positive SIRS criteria within 24 hours of admission, 10 (77%) patients had unfavourable outcome. Among patients with positive SIRS criteria ≥3, four (31%) had died. Patients with ≥3 positive SIRS criteria had mean duration of hospital stay of 13 days. Positive SIRS response is attributed to the patients with three positive features of SIRS criteria. And critical disease severity is included in severe acute pancreatitis for comparison purpose. Khanna AK et al[6], reported unfavourable outcome among patients with positive SIRS criteria

CONCLUSION

The present study found that knowledge of important etiological factors can help the surgeon and physician to predict the disease severity beforehand and disease outcome in early phase. This can play an important role in effective management of each patient. Middle aged (>45 years) patients, more so females with high

Graph-9: Positive SIRS criteria within the first 24 hour of admission

Study	Mean age for a study (In years)	Sex wise age distribution (In years)	
		Male	**Female**
Present study (n=30)	41	53% (n=16)	47% (n=14)
Albulushi A et al,[4] (n=174)	44	54% (n=95)	45% (n=79)
Madson OG et al,[5](n=122)	51	69% (n=84)	31% (n=38)
Khanna AK et al,[6](n=72)	40.5	51% (n=37)	49% (n=35)
Table-10: Comparison of sex wise age distribution with various studies			

BMI (>25kg/m²) have more profound disease course. Patients with BMI >30 kg/m² have more severe disease course and more chances of unfavourable outcome and mortality. Obesity thus can significantly alter the disease process. In this group of patients, intensified management is needed. Complications are also expected in this group of patients.

Development of positive SIRS response (presence of ≥3 positive SIRS diagnostic criteria) on first day of admission can precisely predict the disease severity and thus unfavourable outcome. This can definitely guide clinician early in clinical phase for targeted management of the affected patient. Need of high dependency care in such patients should be timely decided so mortality can be reduced.

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