Original Article

Study of clinical profile in acute pancreatitis using scoring system and its management

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Abstract

This prospective study conducted at PVP Govt Hospital, Sangli and Govt Medical College, hospital Miraj, included 60 patients with acute pancreatitis. 52 males and 8 females (M: F ~ 6.5: 1). The peak incidence was in the fourth decade with the mean age of 37.19 years. The commonest etiology was alcohol accounted for 73.34% of cases followed by gall stone disease (16.67%). Pain and vomiting were the commonest presenting complaints. 3 patients had jaundice. Serum Amylase and Serum Lipase together gave high sensitivity (95%) for diagnosis. Computed Tomography was very sensitive, non invasive tool for diagnosis and imaging of complications. The enteral route was used for nutritional support in 8 patients and total parenteral nutrition was given to 4 patients. The mean hospital stay was 12.13 days (Range – 6 to 34 days) and 12 patients required ICU care. Out of 60 patients 65 % had a mild disease while 35 % had a severe attack. The overall mortality rate was 5% and mortality rate among severe cases was 14.28%.

Keywords: acute pancreatitis.

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INTRODUCTION

More than a century after its comprehensive description, acute pancreatitis remains a common disorder with devastating consequences. The presentation of wide spectrum of symptoms gives the clinician a heart breaking exercise to bring back the patient from the clutches of the disease process. It cannot be too strongly emphasized that the primary treatment of acute pancreatitis is conservative only, but it is the pandora's box of manifestations, with its inherent complications surgery comes into play as diagnostic, prognostic and therapeutic endeavour. Because of the frequent emergency, multimodality presentation, difficult preoperative diagnosis and management of complications, this challenging subject is taken up for the present study in which we will be studying the clinical profile and management of acute pancreatitis in our hospital. Inspite of technical advances in medical and surgical fields acute pancreatitis remains a major cause of morbidity and mortality. Acute pancreatitis is defined as an acute inflammatory process of the pancreas, with variable involvement of other regional tissues or remote organ systems. It may occur as an isolated attack or recur in distinct episodes with reversion to normal histology between attacks. Early assessment and prediction of severity are of outstanding importance to avoid costly and invasive monitoring and treatment in the largest group of patients, who tend to run a benign course. (PROGNOSTIC STRATIFICATION) Objective grading of disease severity would allow comparison of outcomes between centers, a necessity for both effective clinical audit and comparison of differing therapeutic approaches. An accurate assessment of disease severity at hospital admission enables selection of patients for clinical trials.

AIMS AND OBJECTIVES

1. To study etiopathogenesis of acute pancreatitis
2. To study the clinical presentation of acute pancreatitis. using scoring system
3. To study the treatment modalities that can be offered in our institution and the outcome
    - Conservative management
    - Surgical management
4. Audit the results

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MATERIAL AND METHODS

This prospective study was conducted between July 2012 to July 2014 on patients admitted to Government Medical College miraj, patients will be enrolled for the study. The diagnostic criteria includes at least one of the following:

1. Serum amylase more than 4 times the upper limit of normal
2. Serum lipase more than 2 times the upper limit of normal
3. Ultrasound or CT scan suggestive of acute pancreatitis

This is based on the U.K. guidelines for the management of acute pancreatitis.

After approval of institutional ethical committee and written informed consent from the patients , 60 patients were studied.

Inclusion Criteria

- Patients referred to or admitted under department of general surgery and diagnosed to have acute pancreatitis.
- All patients should fulfill the diagnostic criteria
- Patients with acute pancreatitis developing after non penetrating abdominal trauma

Exclusion Criteria

- Acute episodes in patients of chronic panceatitis
- Patients less than 14 years of age

During the first 48 hours patients will be stratified according to the Glassgow criteria as recommended by the U.K. guidelines. All investigations will not be done in patients who already have Glassgow score equal to or more than 3, investigations will not be repeated in patients who are obviously improving and not affordable. On discharge or death patients will be stratified into mild or severe according to Atlanta Classification. Data on complications, investigations, interventions undertaken, outcome, duration of stay in hospital and ICU and mode of nutritional support will be collected. This will be followed by comparison between prediction of severity by Glassgow criteria and Atlanta classification.

Prognostic Stratification

Early assessment and prediction of severity are of outstanding importance to avoid costly and invasive monitoring and treatment in the largest group of patients, who tend to run a benign course.

Necessity of objective stratification30

For practicing clinicians, a method for predicting the likely course of the disease soon after admission would be a guide to the need for more intensive monitoring or transfer to a specialist centre, or serve as justification for any proposed therapeutic intervention.

Multifactor scoring system

Many multifactor scoring systems have been described in an attempt to accurately predict the outcome of the disease.

1. Ranson's criteria
2. Glasgow (imrie) criteria
3. Apache i, ii, iii – (acute physiology and chronic health enquiry)
4. Balthazar's score – depends on ct scan findings.
5. Single prognostic factors :
6. Atlanta classification4

Ranson`S Criteria

One of the early systems for judging severity was developed by Ranson in 1974.27 The five initial criteria assess the severity of the acute inflammatory process, where as the six criteria measured at 48 hours determine the systemic effects of circulating enzymes and toxins.1 The presence of 3 or more Ranson's signs usually indicate severe pancreatitis.

Ranson's criteria7 On admission to hospital	Within 48 hours
Non Gallstone pancreatitis	Decrease in PCV > 10 points
Age > 55 years	Increase in BUN > 5 mg/dl
WBC count > 16,000/mm3	Serum calcium < 8 mg/dl
Glucose > 200 mg/dl	Arterial PO2 < 60 mm Hg
LDH > 350 U/L	Base deficit > 4 mmol/Ltr
Aspartate aminotransferase > 250 U/L	Fluid sequestration > 6 Ltr
Gallstone pancreatitis	Decrease in PCV > 10 points
Age > 70 years	Increase in BUN > 2 mg/dl
WBC count > 18,000/mm3	Serum calcium < 8 mg/dl
Glucose > 220 mg/dl	Base deficit > 5 mmol/L
LDH > 400 U/L	Fluid sequestration > 4L
Aspartate aminotransferase >250 U/L	

Mortality increases with the number of Ranson's signs.1 Criteria	Death rate
2 or < 2	< 1 %
3 – 4	16 %
5 or > 5	> 40 %

Modified Glasgow Criteria

Further modification of this system in Glasgow by Imrie and his colleagues in 1978 led to the Glasgow system where only 9 factors need to be assessed. A further refinement of this system by Blamey and Imrie in 1984 led to Modified Glasgow system where only 8 factors need to be assessed.

Modified Glasgow criteria Within 48 hours of admission
Age > 55 years
WBC count > 15,000/mm3
Glucose > 180 mg/dl
BUN > 45 mg/dl (no response to l.V.fluids)
Lactate dehydrogenase > 600 U/L
Albumin < 3.2 gm/dl
Arterial PO2 < 60 mm Hg
Serum Calcium < 8 mg/dl

Apache system

The APACHE (Acute Physiology and Chronic Health Evaluation) system, was reported by Knaus and colleagues in 1981.10 In the original form, APACHE contained 34 potential physiologic and laboratory measurements and included many continuous variables. A value of zero (normal) to 4 (most abnormal) was assigned to each variable, according to its degree of abnormality. To this was added an assessment of the patient's pre admission status (A – fit to D – severely compromised health) to give the overall APACHE score.

Balthazar's Ct Severity Index CTSI

The morphological severity of acute pancreatitis can be defined precisely using the CT Severity Index developed by Balthazar and co-workers.12 The severity of the acute inflammatory process is categorized into Stage A through E, corresponding to scores of zero to four respectively. Secondly the presence and extent of gland necrosis is assessed. The CT grade score is added to the necrosis score.

Balthazar's CT severity index11,12 CT grade	CT scan description	
A	Normal pancreas	0
B	Intrinsic changes- < 3cm of necrosis enlargement intrapancreatic fluid collection	1
C	Intrinsic and Extrinsic inflammatory changes	2
D	Extrinsic changes- Not > 1 peripancreatic fluid collection	3
E	Multiple or extensive extrapancreatic fluid collection or Abscess	4

Necrosis	Score
None	0
< 30 %	2
30 to 50 %	4
> 50 %	6

CT Severity Index : Index	Morbidity	Mortality
0 – 3	8 %	3 %
4 – 6	35 %	6 %
7 – 10	92 %	17 %

Drawbacks of CT scan are the expenses, limited availability, limited specificity and inconvenience for sev

Single Prognostic Factors

Single Prognostic factors for early (Day 1) prediction of Severity in Acute Pancreatitis32 Factor	Sensitivity (%)	Specificity (%)
Interleukin – 6	100	71
Phospholipase A2	75	78
TAP	58	73
SPINK / HPSTI	71	77
Trypsinogen – 2	91	71
Hong Kong criteria	79	67
Hepatocyte growth factor	71	86
Neutrophil elastase	77	92
Neopterin	21	93
Procalcitonin33	67	89

TAP: Trypsinogen activation peptide, **SPINK:** Serine Protease inhibitor Kazal type, **HPSTI:** Human Pancreatic Secretory Trypsin inhibitor

Atlanta Classification4

An international symposium was conducted from Sep 11 through 13, 1992, at Atlanta, and an unanimous consensus on a series of definitions and a clinically based classification system for acute pancreatitis was achieved by a diverse group of 40 international authorities from six medical disciplines and 15 countries.

The Atlanta symposium defined terms like acute pancreatitis (severe and mild), acute fluid collections, necrosis, pseudocyst and abscess. The present study makes use of these definitions while describing the patient outcome.

RESULTS

Sex Distribution

Of the 60 patients 52 (86.67%) were males and 8 (13.33%) females. Of these 19 (36.54 %) males had a severe disease compared to 2 (25%) females.

Age Distribution

The mean age of the study group was 37.19 years (Range 20 – 64 yrs). The peak incidence was in the 4th decade

Clinical Features

The commonest presentation was with pain in the abdomen and vomiting. Pain in abdomen was present in 55 (91.67%) patients and vomiting in 32 (53.34 %) patients. Other clinical features included distention of abdomen in 8 (13.34%) cases, fever in 6 (10 %) cases and jaundice in 3 (5 %) cases.

Co Morbidities

13 patients out of 60 had history of pre existing co-morbidities in the form of Diabetes[8], Hypertension[6], Ischemic heart disease[2] and Rheumatic heart disease[1]. four of the eight diabetics had a severe disease.

One patient was a known case of retroviral disease on antiretroviral thearapy.

Etiology

Alcohol consumption was the most common etiology with history of alcohol consumption present in 44(73.34%) patients. 10(16.67%) patients had biliary pancreatitis, with majority[7] of them having a mild disease. One patient of these had hereditary spherocytosis with pigment stones in the gallbladder and common bile duct. 3(5%) patients had pancreatitis due to blunt injury to the abdomen. Two patients had drug induced pancreatitis. One of them was a known case of RVD and on ART. Other one was on tab. Furosemide. No cause was found in two patients

Dignostic Investigations

While serum Amylase supported diagnosis in 46 cases (Sensitivity 76.67%) and serum Lipase supported the diagnosis in 53 cases (Sensitivity 88.34 %), both Serum Amylase and Serum Lipase together picked up 57 cases (Sensitivity 95 %). Ultrasonography (USG) of the abdomen was done in all cases and it supported the diagnosis in 51 cases (85%). Contrast Enhanced Computed Tomography (CECT) was done in 18 patients and it supported the diagnosis in all the cases in which it was done.

Severity stratification and co- relation of glasgow scores

At the time of discharge or death all cases were classified into mild or severe according to the Atlanta classification. 39 (65 %) patients had a mild disease while 21 (35 %) had a severe attack. During the first 48 hours patients were predicted to have severe or mild disease according to Glasgow criteria. According to Glassgow criteria 43 out of 60 patients were predicted to have mild disease and 17 out of 60 patients were predicted to have severe disease.

SEVERE CASES: 12 cases out of 17 were correctly predicted to be severe by the Glasgow scores.

MILD CASES: 34 cases out of 43 were correctly predicted to be mild by the Glasgow scores. Therefore a total of 46 (76.67 %) cases were correctly predicted to have mild or severe disease. Hence positive predicitive value of Glassgow criteria found to be 76.67%.

Local Complications

Pancreatic ascitis was present in 7(11.67%) patients.All of them were treated conservatively. Organised fluid collections in the form of pseudocyst detected by either USG or C.T. scan was present in 6(10%) patients. Most of these were treated conservatively and by follow up but one of them with thick cyst wall was treated with cystogastrostomy during the same hospital admission. 4(6.67%) patients had acute necrosis confirmed on contrast enhanced C.T. scan with one of these patients developed pancreatic abscess which was drained under CT guidance but patient died secondary to multiorgan failure. Out of Three other patients two underwent necrosectomy and one was treated conservatively.

Other Complications

9(15%) patients had pleural effusion, mainly on the left side. None of them required therapeutic aspiration. 3(5%) patients had basal atelectasis. 1 patient had wound dehiscence and 1 patient had deep vein thrombosis (DVT).

Organ Failure and Mortality

2(3.34%) patients had ARDS evident on the X – rays of chest and required mechanical ventilation. 2(3.34%) patients had acute renal failure (ARF); both required haemodylasis.

3 (5 %) patients died; two of these died secondary to ARDS

Procedures

6(10%) patients with biliary pancreatitis had ERCP and sphincterotomy with 4 of them who had CBD stones were stented. They all were advised Cholecystectomy at a later date. Necrosectomy was performed on 2(3.34%) patients with pancreatic necrosis. A patient with pancreatic abscess underwent CT guided external drainage of abscess. One patient with traumatic pancreatic tail distruction underwent Exploratory laparotomy with debridement of pancreas. Open cystogastrostomy was performed in one patient with matured pancreatic pseudocyst.

Nutritional Support

Nutritional support was given to 12(20%) patients with severe acute pancreatitis. 8(13.34%) patients had enteral nutrition (EN) by naso – jejunal (NJ) feeding while 4(6.67%) patients were given total parenteral nutrition (TPN).

Hospital Stay And Icu Care

The mean hospital stay was 12.13 days (Range – 6 to 34 days). The mean hospital stay in severe cases was 18.33 days while in mild cases was 8.79 days.

DISCUSSION

Patients with severe acute pancreatitis demand considerable resources in the form of imaging, endoscopy, surgery and intensive care.55 This study was conducted at PVP Government Hospital, Sangli and Govt. medical college, Miraj a tertiary care centre with round the clock radiology and emergency services. The ICU facilities and the expertise surgeons are available. In this study, analysis of clinical presentation of acute pancreatitis was done. Relevant investigations were carried out and patients appropriately managed depending upon the etiology and severity of acute pancreatitis.

Age

The mean age of presentation in our study was 37.19 years and is comparable to the study by Kashid A *et al*.i.e

35. 56 Other studies had late presentation in the 5th and 6th decade. This is probably because alcohol was the main etiological factor in our study which presents usually in the younger age group.

Sex

There was a male predominance in our study with males accounting for 86.67% of patients with a M:F ratio is 6.5:1. The other studies by Kashid A *et al*, Pupelis G *et al*, Buchler MW *et al* although had a higher percentage of males the ratio of M:F was low. This again could be attributed to alcohol which was the main etiologic agent and which is more common in male population of low socioeconomic status in India.

Etiology

Alcohol was the main etiological factor in our study and present in about 73.34% of patients. This was comparable to the study by Sand J59 at Finland. i. e. 70%. In the other studies gall stone was the main etiological factor in Kashid A *et al*, Buchler MW *et al*

Clinical Features

The clinical features in the present study were comparable to the study by Kashid A *et al*. i.e. pain in abdomen is main symptom.

Serum Amylase Sensitivity

The sensitivity of serum amylase was 76.67% in the present. In the study by Thomson 60 it was 95.6% sensitive and this can be attributed to the late presentation of patients to our institution, and also because alcohol is the main etiological agent, where the rise of S. Amylase is less compared to biliary pancreatitis.

Accuracy of USG Abdomen

USG was diagnostic in 85% of patients in our study and this was comparable to the study by Ammori *et al*. It was diagnostic in 66.67% of patients in the study by Kashid A and this may be because USG is operator dependent and also because the view can be obscured by overlying bowel gas.

Severity of Acute Pancreatitis

65% of the patients had a mild disease in our study where as the other studies had a higher proportion of severe disease. Ours is a government funded institute, and most of the patients belonging to low socio-economic status with acute pain abdomen are referred, and this may be the reason for less percentage of severe cases.

Complications

Although 11.67% of patients in the present study had ascites which was higher compared to other studies, the rate of pancreatic necrosis was more in other studies as against 6.67% in our study. Organ failure was seen in 6.67% of our patients whereas it was much higher in other studies and this is because most patients in our study had mild disease.

Comparison of complications Complications

	Kashid A *et al*	Buchler MW *et al*	Present study
Pseudocyst (%)	0	2.45	10
Ascites (%)	0	-	11.67
Pancreatic necrosis (%)	18.18	42.15	6.67
Organ failure (%)	29	36.28	6.67
Pancreatic abscess (%)	5.45	0.5	1.67

Duration Of Hospital Stay

The mean duration of stay in mild cases being 8.79 days and in severe cases being 18.33 days were comparable to other studies. i.e. in Kashid A *et al* is 10 and 13.5 and in Buchler MW *et al* is 13 and 44.1

Mortality

The mortality rate in our study standing at 5% is comparable to other studies in Buchler MW *et al* is 4.4 and in Kashid A *et al* is 5.45

CONCLUSION

The incidence of acute pancreatitis was found to be in a younger age group in our study. Serum Amylase and Lipase both were (95 % sensitivity) used for diagnosis where ever possible. Ideally all cases should be stratified during the first 48 hours according to one of the scoring systems. Scoring systems help to identify patients who are more likely to have a severe attack. Severe cases should be managed in well equipped ICU, since they may require massive fluid resuscitation, mechanical ventilation and haemodialysis. Support of specialist in radiology, endoscopy and intensive care unit are essential. Timely intervention by endoscopist and surgeons crucial to reduce morbidity and mortality. Further attacks should be prevented by early cholecystectomy and avoiding alcohol.

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