

Original Research Article

Acute pancreatitis: Causes, pathophysiology, different modalities of management


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Abstract

Background: This study was intended to throw light upon the topic of acute pancreatitis, its incidence, etiology, pathogenesis as well as its management.

Aim and objectives: To review and study the patients who presented with acute pancreatitis, to find out the incidence of acute pancreatitis and study the various etiological factors, to study the various modalities of treatment of acute pancreatitis, both conservative as well as operative, to study the incidence and management of complications of acute pancreatitis, factors influencing incidence as well as its outcome.

Materials and methods: This was a prospective study of management of 50 cases of acute pancreatitis, admitted in surgical department. All admitted patients underwent work up for the diagnosis and cause of Acute Pancreatitis. The severity grading was done according to the Ranson's criteria. All patients were monitored with serial examinations and investigations. Patients with mild pancreatitis were treated conservatively at first and surgical intervention was done only in cases of gallstone pancreatitis with diagnosed GB or CBD calculi. Surgical intervention was in form of cholecystectomy or ERCP. Patients with severe pancreatitis were treated conservatively at first. Outcome was monitored in terms of discharge from hospital or mortality. Each patient was evaluated as per the predesigned proforma of the study, a copy of which is attached. Follow up of a minimum of six months was kept and patients with recurrent attacks were monitored and treated either conservatively or surgically as indicated.

Results: The highest incidence of acute pancreatitis was found in the age group of 41 to 60 years followed by the age group of 21 to 40 years. Acute pancreatitis was found more commonly in males.

(41 out of 50 that is 82%) compared to females (9 out of 50 that is 18%). Alcohol was found to be the most common cause of acute pancreatitis (44%) , followed closely by Gallstones (36%), While in 10% of patients no cause could be found (idiopathic group). Overall conservative management is favorable over surgical management in terms of mortality in about 70% of cases. Mortality was not found in the mild pancreatitis group and all 34 patients were discharged. However, 6 out of 16 patients with severe pancreatitis expired (37.5%).

Conclusion: Conservative management is more favourable in both mild and severe type of acute pancreatitis.

Key words

Acute pancreatitis, Etiology, Complications, Management.

Introduction

This study was intended to throw light upon the topic of acute pancreatitis [1], its incidence, etiology, pathogenesis as well as its management. The pancreas is perhaps the most unforgiving organ in the human body. The forsaken and feared organ however has no intention of going unnoticed. Time and again we are confronted with patients rolling over in their cots in agony when this entity flares up and herewith we attempt to deal with the most practical, effective yet economical manner. Being surgeons we are often required to decide as to whether to 'wait and see' or 'open and see' weighing the pros and cons of each. Fewer conditions in surgery pose furthermore controversies regarding surgical or conservative course of management than that of acute pancreatitis.

Aim and objectives

- To review and study the patients who presented with acute pancreatitis.
- To find out the incidence of acute pancreatitis and study the various etiological factors.
- To study the various modalities of treatment of acute pancreatitis, both conservative as well as operative.
- To study the incidence and management of complications of acute pancreatitis.
- Factors influencing incidence as well as its outcome.

Material and methods

This was a prospective study of management of 50 cases of acute pancreatitis, admitted in surgical department. All admitted patients underwent work up for the diagnosis and cause of Acute Pancreatitis. The severity grading was done according to the Ranson's criteria. All patients were monitored with serial examinations and investigations. Patients with mild pancreatitis were treated conservatively at first and surgical intervention was done only in cases of gallstone pancreatitis with diagnosed GB or CBD calculi. Surgical intervention was in form of cholecystectomy or ERCP. Patients with severe pancreatitis were treated conservatively at first. Patients having pancreatic necrosis or acute fluid collection with no evidence of sepsis were managed conservatively. Those patients who developed sepsis in form of infected pancreatic necrosis or pancreatic abscess formation underwent surgical intervention in terms of necrosectomy, debridement or drainage of pancreatic abscess. Outcome was monitored in terms of discharge from hospital or mortality. Each patient was evaluated as per the predesigned proforma of the study, a copy of which is attached. Follow up of a minimum of six months was kept and patients with recurrent attacks were monitored and treated either conservatively or surgically as indicated.

Results

The highest incidence of acute pancreatitis was found in the age group of 41 to 60 years followed by the age group of 21 to 40 years. Acute

pancreatitis was found more commonly in males. (41 out of 50 that is 82%) compared to females (9 out of 50 that is 18%). Alcohol was found to be the most common cause of acute pancreatitis (44%) , followed closely by Gallstones (36%), While in 10% of patients no cause could be found (idiopathic group). Overall conservative management is favorable over surgical management in terms of mortality in about 70% of cases. Mortality was not found in the mild pancreatitis group and all 34 patients were discharged. However, 6 out of 16 patients with severe pancreatitis expired (37.5%) as per **Table – 1** to **Table – 5**.

Table – 1: Distribution according to etiology.

Etiology	No. of patients	JPN meta-analysis study [2]
Gallstone	18 (36%)	24-30%
Alcohol	22 (44%)	30-40%
Idiopathic	05 (10%)	15-20%
Trauma	02 (4%)	04-08%
Others	03 (6%)	10-15%

Table – 2: Comparison between severity of pancreatitis and serum amylase level (at admission).

Severity	Serum Amylase levels at admission			
	<300	300-600	600-900	>900
Mild	1	20	11	2
Severe	1	08	06	1

Table – 3: Systemic complications.

Complications	Mild	Severe
Acute renal failure	0	5 (31%)
Pulmonary	2 (6%)	8 (50%)
D.I.C.	0	1 (6%)

Table – 4: Local complications.

Complications	No. of patients
Acute Fluid collection	7 (14%)
Pancreatic Necrosis	4 (8%)
Pancreatic Abscess	3 (6%)
Infected Pancreatic necrosis	3 (6%)
Vascular aneurysm	0

Discussion

The highest incidence of acute pancreatitis was found in the age group of 41 to 60 years followed by the age group of 21 to 40 years. It was relatively less common in the extremes of age groups. This is comparable to the findings of the JPN meta-analysis [2]. The age group of 41 to 60 is commonly afflicted by both alcohol addiction and gallstone thus accounting for the increased incidence. Most patients of age 21 to 40 have alcohol as the etiological factor. Acute pancreatitis was found more commonly in males. (41 out of 50 that is 82 %) compared to females (9 out of 50 that is 18%) [3]. As per the JPN study. Sex is strongly associated with the risk of acute pancreatitis: the incidence of alcoholic pancreatitis is higher in men. It found male to female ratio of 7 to 8.5: 1, which is similar to my study. This can be partly explained by the prevalence of alcohol consumption amongst males. Alcohol was found to be the most common cause of acute pancreatitis (44%) , followed closely by Gallstones (36%), While in 10% of patients no cause could be found (idiopathic group). Worldwide, according to JPN meta-analysis, the incidence of acute alcoholic pancreatitis was fairly similar to that of gallstone pancreatitis [4]. The higher incidence of alcoholic pancreatitis in my study can be attributed to the comparatively low incidence of gallstones in Indian population compared to the west, partly because of different diet habits [5]. In the study there were 34 patients who suffered from mild pancreatitis (68%), while 16 patients suffered from severe pancreatitis (32%). Thus most of the attacks of pancreatitis were found to be mild. In the JPN study, severe pancreatitis accounts for about 18-25%. The increased incidence in my study may be explained by the fact that most patients in the institute are referred from outside because it is a tertiary institute. 4 patients out of 18 with gallstone as etiology developed severe pancreatitis (22%). 9 patients out of 22 with alcohol as etiology developed severe pancreatitis (40%). 2 patients out of 3 with idiopathic etiology developed severe pancreatitis (66%) while 1 out of total 4 with

other causes developed severe pancreatitis (25%). Thus, alcohol was found to cause severe pancreatitis in more patients compared to gallstones. This is similar to the observation made by the JPN meta-analysis, which concludes that alcoholic pancreatitis is more severe than gallstone pancreatitis [6]. Serum Amylase levels were not found to be predictors of severity of pancreatitis because the levels were found to be similar in both mild and severe groups over the given range. This is consistent with the observations made in various studies. Thus we can conclude that though Serum Amylase is an important marker for diagnosis, we cannot rely on its level to predict the severity of the disease [7]. Many studies that have been performed in this regard have reached the same conclusion. As expected, the incidence of systemic complications was much higher in severe pancreatitis compared to mild pancreatitis [8]. Pulmonary complications were the most common followed by acute renal failure. One patient developed Disseminated Intravascular Coagulation. This is consistent with the observations made in most of the surgical textbooks. Thus we can conclude that patients with severe pancreatitis need enhanced surveillance and ICU care compared to those with mild disease. Also, chest physiotherapy and strict maintenance of fluid electrolyte balance is essential. The most common local complication was acute fluid collection; followed by pancreatic necrosis, pancreatic abscess and infected pancreatic necrosis [9]. All the local complications were present only in cases of severe pancreatitis. None of the patients with mild disease developed any local complication during the course of study. This is consistent with the data from the JPN meta-analysis. Thus, severe pancreatitis is associated with increased incidence of local complications. Out of 34 patients with mild Pancreatitis, 22 were managed conservatively, without any mortality. However, 12 patients underwent surgery as part of treatment for cause of pancreatitis, 10 underwent cholecystectomy for GB calculi and 2 underwent ERCP for CBD calculi. There was no mortality in both groups. Thus surgical intervention for

Gallstone pancreatitis in mild pancreatitis was found to be safe [10]. 3 out of 10 patients with severe pancreatitis (with pancreatic necrosis or acute fluid collection) managed conservatively expired (30%). 3 out of 6 patients with severe pancreatitis (with infected pancreatic necrosis or pancreatic abscess) managed with surgical intervention expired (50%). Thus, survival of patients was higher in conservative group (70%) compared to survival of patients undergoing surgical intervention in severe pancreatitis [11]. Overall conservative management is favorable over surgical management in terms of mortality in about 70 % of cases. According to the JPN meta-analysis, case fatality of acute pancreatitis ranges from 201% to 7.8% overall and from 8% to 25% in cases of severe pancreatitis, mortality rates of up to 40% are seen in patients undergoing surgery in form of necrosectomy or drainage of pancreatic abscess. Cholecystectomy in 2nd week and ERCP in the 1st week were safe and had no mortality. Necrosectomy in an infected pancreatic necrosis had a mortality of 66% and was done in the 4th week, 1 patient developed ARF and had to undergo a hemodialysis for the same. Drainage of abscess in 3 patients was done in the 5th week and had a mortality of 33%; 1 patient developed DIC and was managed with FFP, but the patient expired during treatment. Begers peritoneal lavage with 3 litres of normal saline per day was given in a total of 4 patients (2 with necrosectomy and 2 with drainage of abscess). Begers lavage was found to decrease mortality in this subset. Mortality was not found in the mild pancreatitis group and all 34 patients were discharged. However, 6 out of 16 patients with severe pancreatitis expired (37.5%). The JPN meta-analysis has described a mortality of 15-30% in most series of series of severe pancreatitis and of about 0 to 2 % in mild pancreatitis. Amongst the total of 34 patients with mild disease, 22 were managed conservatively only, but 12 patients (with gallstone as etiology) required surgical intervention in form of ERCP and cholecystectomy. Mortality in mild pancreatitis in both conservative and surgical group was

similar [12]. Amongst the total of 16 patients with severe attack of pancreatitis, 10 were managed conservatively only and had a mortality rate of 30%. 6 patients (having infected necrosis

or abscess) required surgery and mortality was 50% in this group. This is similar to the mortality rate mentioned in the JPN study in the journal of hepatobiliary and pancreatic surgery.

Table – 5: Different surgical modalities.

Modality	Total	Week of surgery	Mortality	Discharge	Complications	Treatment
Cholecystectomy	10	2 nd	0	10	none	-
ERCP	2	1 st	0	2	pulmonary	Medical
Necrosectomy	3	4 th	2	1	Acute renal failure	Dialysis
Drainage of abscess	3	5 th	1	2	DIC	Medical
Begers lavage	4	Post operative	1	3	none	-

Conclusion

Trauma and idiopathic causes account for most cases in children, alcohol and less commonly gallstone are the cause of pancreatitis in young adults and middle age group patients. Men seem to be affected more commonly than females. Most patients of mild pancreatitis are best treated by conservative approach. Also cholecystectomy in same admission setting is safe, effective and should be recommended and is best done in second week. Similarly most patients having severe pancreatitis can be treated with conservative approach. Surgery in severe pancreatitis is associated with comparatively higher mortality and should be reserved for infected pancreatic necrosis and pancreatic abscess. It is best to wait for 3 to 4 weeks before going for surgical intervention.

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