European Journal of Molecular & Clinical Medicine

ISSN 2515-8260 Volume 09, Issue 03, 2022

Original Research Article

Clinical, etiological profile and outcomes of patients with acute pancreatitis in a tertiary care hospital, South India: A cross-sectional study

[1]Dr. Anjaney Yadur, [2]Dr. Dhanalaxmi Neginhal, [3]Dr. Sagar Patil

[1]Senior Resident, Department of General Medicine, Belgaum Institute of Medical Science, Belgaum, Karnataka, India
[2]MBBS, MD (Anatomy), Belgaum Institute of Medical Sciences, Belgaum, Karnataka, India
[3]MBBS, DNB (General Medicine), S. Nijalingappa Medical College, Bagalkote, Karnataka, India

Corresponding Author:
Dr. Anjaney Yadur (dranjaney@gmail.com)

Abstract

Background: Acute pancreatitis, characterised by inflammation, auto-destruction and activation of pancreatic enzyme is a common gastro-intestinal cause of hospital admission. Understanding the etiology, clinical profile and clinical outcomes of these patients in regional setting is key for appropriate management.
Methods: A hospital based observational study was carried out between August 2011 and July 2013 among patients above 18 years of age who presented to the outpatient department with acute pancreatitis. Patients demographic, clinical information, and laboratory findings was obtained at admission. All patients were subjected to ultrasonography and patients with severe disease were subjected to Computed Tomography. The clinical severity and outcomes were recorded. Data was summarised as mean (SD) for continuous variables and proportions for categorical variables.
Results: Among 94 subjects included in the study, about 85% were males and 69% were aged less than 45 years. Abdominal pain (88%) was the most common clinical presentation, followed by vomiting (49%). Alcohol was the most common etiological factor seen in about 60% of the subjects. Ultrasonography revealed bulky pancreas in 38% and gallbladder calculi in 33% of the subjects. Acute kidney Injury was present among 3% of the patients. About 9% had severe disease and mortality was 2.1%. There was marked increase in the levels of pancreatic enzymes, BUN and serum creatinine among patients with severe disease when compared to patients with mild/moderate disease.
Conclusions: Acute pancreatitis is a leading causes of hospitalization due to gastro-intestinal cause. Clinical assessment along with radiological findings correlates well with the disease severity and mortality. Understanding the clinical and etiological profile of patients with acute pancreatitis would be helpful to plan the management strategies for the local setting.

Keywords: Clinical, etiological profile, acute pancreatitis, ultrasonography

ISSN 2515-8260 Volume 09, Issue 03, 2022

Introduction

Acute Pancreatitis is characterised by inflammation of pancreas leading to auto-destruction of pancreatic tissue, obstruction of pancreatic secretory transport, and activation of pancreatic enzymes [1]. Acute pancreatitis patients present with abdominal pain, three-fold increase in serum lipase activity, with supporting radiological findings [2]. The pathology is linked to premature activation of trypsinogen into trypsin in the acinar cells. This can be secondary to increased pressure in the duct (due to obstruction) or impairment of calcium homeostasis [2].
The global incidence of acute pancreatitis was 34.8 per lakh with a slight preponderance among male compared to females (38.8 vs 30.6 per lakh) [3]. The age standardised mortality has decreased from 1.7 per lakh in 1990 to 1.4 per lakh in 2019. The incidence in India is about 43 per lakh population and mortality ranges between 1.5 to 2.0 per lakh population [3]. It is a common cause of gastro-intestinal related hospitalisation in India and mortality varies between 2% to 10% [4]. The incidence and etiology of acute pancreatitis varies across geographic regions and socio-economic status. Alcohol use is the commonest cause of acute pancreatitis in India, followed by gall stones [4]. Incidence of acute pancreatitis increases after fourth decade of life and mortality is more with increasing age [5].
The clinical presentation of acute pancreatitis can be either mild or severe according to the Atlanta Classification. Severe acute pancreatitis is characterised by the presence of organ failure, local complications, with or without pancreatic necrosis [6]. Majority of the patients have mild disease, while about 10-20% progress to severe form of disease. There are several factors that are implicated in the severity of Acute Pancreatitis such as age, sex, etiology, obesity, presence of organ failure, hemoconcentration, elevated CRP levels, elevated serum creatinine, BUN and radiological signs in CT/MRI.
The appropriate management of acute pancreatitis depends on early recognition of the condition. Hence it is important to carefully examine the findings from patient history and various investigations to arrive at the accurate diagnosis [7]. The aim of management is to preserve the functional morphology of the pancreas, eliminate the underlying etiology to avoid future attacks. Mild cases of pancreatitis are treated conservatively with intra-venous fluid administration. However, severe pancreatitis may require a more aggressive approach in an intensive care unit setting.
Several studies have explored the clinical profile of acute pancreatitis in different populations and settings. However, very few studies have tried to explore the clinical profile of acute pancreatitis in the South Indian population. Hence, this study was to understand the profile and outcomes of patients admitted for acute pancreatitis in a tertiary care hospital of Mysuru, South India.

Methods

Study setting, design and period: Hospital based cross-sectional study was carried out between August 2011 and July 2013 for a period of two years. The study was conducted in the department of General Medicine and Gastroenterology of a tertiary care hospital, Mysuru.

Study population, selection criteria

All patients above 18 years of age who presented to the outpatient department with acute pancreatitis (two out of three criteria-upper abdominal pain, elevated serum amylase above 3 times the upper limit of normal, supportive radiological findings in ultrasonography) were included in the study as participants. Patients with chronic pancreatitis, recurrent attacks, radiological evidence of other pancreatic pathology like pancreatic malignancy, cyst, previous pancreatic surgery, and pregnant women were excluded this study.

ISSN 2515-8260 Volume 09, Issue 03, 2022

Sample size: Based on the finding that 82.1% of subjects had mild Pancreatitis (Ramu R *et al*.) [8] and assuming an alpha error of 5%, absolute precision of 8%, the sample size was calculated to be 89 subjects with diagnosis of pancreatitis. The sample size was increased to 94 accounting for 5% loss-to-follow-up among these patients. The sample size was calculated using the formula:

$$N = \frac{(Z_{1-\alpha/2})^2 p*q}{d^2}$$

Where
p – Expected proportion with mild/moderate disease, q=1 – p.
$Z_{1-\alpha/2}$ = 1.96 (alpha error of 0.05), d is the absolute precision.

Study procedure

The study was carried out following approvals from scientific committee and Institutional Ethics Committee. Informed written consent was obtained from eligible participants and investigator interviewed the participants using a questionnaire. Information on age, gender, symptom at presentation, and history of alcohol use were recorded on the proforma. The following pathological and biochemical tests were carried out in the laboratory: Serum amylase, Serum Lipase, Blood sugar, Blood urea Nitrogen, Serum creatinine, and Serum ALP. All patients were subjected to Ultrasonography within 6 hours of presentation to the hospital. The screening and reporting were done by a gastrointestinal radiologist and the results were noted in the proforma. Computer Tomography was done for selected cases where radiologist suspected severe disease.

Study variables and Data analysis

Data on patient's age, sex, presenting symptom, history of alcohol use, hypotension at admission, ultrasonography and CT findings, serum levels of amylase, lipase, BUN, creatinine, ALP and random glucose, survival status, complications, and disease severity were collected and analysed. Data was entered using Microsoft Excel and analysed using SPSS version 17 [9]. Categorical variables were summarised using proportions (percentages). Continuous variables such as serum levels were summarised using mean with standard deviation and compared between mild and severe patients using Independent samples t-test. P-value less than 0.05 was considered statistically significant.

Results

Of the total 94 subjects included in the study, majority were males (85.1%) and about half were aged between 31 and 45 years (47.9%). The commonest presentation was abdominal pain, which was present among 88.3% of the participants, followed by vomiting (48.9%). About a third of patients presented with fever (29.8%). Abdominal distension and Jaundice were present in about 9.6% and 8.5% of the subjects respectively.
Of the total participants, about 49% did not have any co-morbidity. About 25.5% had Diabetes mellitus with Hypertension. Another 22.3% had only Diabetes mellitus and 3.2% had only hypertension. About 56 patients (59.6%) reported that they used alcohol in the last one year. About 4 patients (4.3%) had presented with hypotension at the time of admission. About 9 patients (9.6%) had severe disease and 2 (2.1%) had died during the course of hospitalization. Of the total 94 subjects, nine (9.6%) had severe disease and the remaining 85 (90.4%) had mild or moderate disease. Only 4 patients developed complications during the course of illness. Acute Kidney Injury was seen among three patients (3.2%), followed by ARDS in two patients (2.1%).

ISSN 2515-8260 Volume 09, Issue 03, 2022

About 80% of the patients had supportive radiological evidence of pancreatitis. The commonest ultrasonography finding was bulky pancreas with diffuse hypoechoic area, which was found in 30 patients (31.9%), followed by gall bladder calculi (25.5%). CT was performed only in a subset of individuals with severe disease. About 8 patients (8.5%) had intrinsic changes, necrosis, enlargement with intra-pancreatic fluid accumulation.

The levels of pancreatic enzymes were elevated among patients with severe disease when compared to patients with mild/moderate disease. The mean (SD) level of serum amylase was 287.9 (225.2) IU among patients with mild and moderate disease as compared to 1422.1 (220.1) in severe disease patients. There was also marked elevation of Lipase among severe patients (1407.1) compared to mild and moderate patients (665.9). Patients with severe disease also had significantly elevated BUN and serum creatinine.

Table 1: Description of the study participants (n=94)

Demographic characteristics	Frequency (%)
Age group	
18-30 years	20 (21.3%)
31-45 years	45 (47.9%)
46-60 years	17 (18.1%)
61-70 years	12 (12.8%)
Sex	
Male	80 (85.1%)
Female	14 (14.9%)
Clinical Presentation	
Abdominal pain	83 (88.3%)
Vomiting	46 (48.9%)
Abdominal distension	9 (9.6%)
Fever	28 (29.8%)
Jaundice	8 (8.5%)
Co-morbidity	
Diabetes Mellitus	21 (22.3%)
Diabetes Mellitus with Hypertension	24 (25.5%)
Hypertension	3 (3.2%)
No co-morbidity	46 (48.9%)
History of Alcohol use	
Present	56 (59.6%)
Absent	38 (40.4%)
Hypotension at presentation	
Yes	4 (4.3%)
No	90 (95.7%)

Table 2: Description of complications, severity and outcomes among patients with pancreatitis (n=94)

Outcomes	Frequency (%)
Mortality	
Died	2 (2.1%)
Survived	92 (97.9%)
Severity	
Mild/Moderate	85 (90.4%)
Severe	9 (9.6%)
Complications	
Pseudocyst pancreas	1 (1.1%)
Pleural effusion	1 (1.1%)
Acute Kidney Injury	3 (3.2%)

ARDS	2 (2.1%)
Nil complications	90 (95.7%)

Table 3: Description of the radiological finding among patients with pancreatitis (n=94)

Radiological findings	Frequency (%)
USG	
Normal pancreas and abdominal organs	19 (20.2%)
Bulky pancreas/diffuse hypoechoic pancreas	30 (31.9%)
Calculi in gall bladder	24 (25.5%)
Focal hypoechoic pancreas	14 (14.9%)
Bulky pancreas with gallbladder calculi	6 (6.4%)
Focal hypoechoic pancreas with gallbladder calculi	1 (1.1%)
CT-Abdomen	
Intrinsic change, necrosis, enlargement, intrapancreatic fluid accumulation	8 (8.5%)
Inflammatory changes (intrinsic/extrinsic)	1 (1.1%)
Extrinsic changes not more than 1 peripancreatic fluid collection	2 (2.1%)
Extra-pancreatic collection of extensive fluid	2 (2.1%)

Table 4: Distribution of serum levels of Amylase, Lipase, BUN, Creatinine and Random Glucose among patients with Acute Pancreatitis (n=94)

Serum Parameters (Mean with SD)	Mild/moderate Pancreatitis	Severe Pancreatitis	p-value
Amylase	287.9 (225.2)	1422.9 (785.6)	<0.001
Lipase	665.9 (494.9)	1407.1 (220.1)	<0.001
ALP	127.0 (175.0)	109.2 (31.6)	0.763
BUN	31.2 (16.2)	70.9 (49.4)	<0.001
Creatinine	1.2 (0.5)	2.5 (1.7)	<0.001
Glucose (random)	160.2 (87.1)	197.8 (103.1)	0.229

Discussion

This study was conducted among patients who presented with features of acute pancreatitis to study the clinic-etiological profile and outcomes. Our study has shown that majority of the patients were males and aged less than 45 years of age. Abdominal pain was the commonest presenting symptoms, followed by vomiting and fever. More than half of the patients had history of alcohol use. About one in ten patients had severe pancreatitis, 4% developed some complications and mortality was about 2%.

Our study has shown a male preponderance to acute pancreatitis, which is similar to the findings of the other studies [8, 10-14]. This is probably due to higher proportion of males using alcohol in the study setting. Acute pancreatitis can occur in any age group. The mean age was about 45 years and majority of the cases occur between 20-40 years of age evident from the current study and other previously published studies. Musa Khan *et al*. has reported that 74% of the cases occurred between 20-40 years [14]. Rishabh Sehgal *et al*. reported that 67.5% of the patients were aged less than 40 years [9].

Acute pancreatitis has a characteristics clinical presentation wherein majority of our patients presented with abdominal pain (88%) followed by nausea and vomiting, which was present among 49% of patients. This finding is similar to all previously published literature wherein abdominal pain is the most common presenting symptom for patients with acute pancreatitis [8, 10, 11, 13, 14]. Nausea and Vomiting was invariably the accompanying symptom in more than half of the patients. About 48% of subjects in our study reported having diabetes. This finding is similar to Abhiranjan Prasad *et al*. and Enas Ahmed *et al*. where 60% and 30% of the patients had diabetes mellitus respectively [13, 15]. Several Indian studies have reported that alcoholism was the most common cause of pancreatitis in our setting. Our study too has

confirmed this finding, wherein 60% of the patients reported alcohol use. Alcohol was the etiological factor was reported among 42.4% by Ramu R *et al*. [8], 59.3% by Nitesh Negi *et al*. [10], 90% by Surajit *et al*. [11], 55% by Rishabh Sehgal *et al*. [12]. However, Enas Ahmed *et al*. reported that gall stones to be the most common etiological factor and this could possibly be explained by the study setting (Eastern Mediterranean) where the dietary practices are different [15]. The study by Abhiranjan Prasad reported that biliary cause was the commonest etiology for pancreatitis [13]. This study included a higher proportion of women and obese patients.

Acute Pancreatitis is a disease that varies in severity ranging from a mild self-limiting disease to a very severe and rapidly deteriorating illness. Our analysis showed that one out of ten patients had severe disease. This is similar to the findings from *Musa Khan et al.* [14] and *Ramu R et al.* [8] where only less than 6% of the patients had severe disease. However, studies by *Nitesh Negi et al.* and *Enas Ahmed et al.* Has shown a higher proportion of severe cases (22%). The commonest complication encountered was acute kidney injury (6%) followed by respiratory failure (4%). Other studies have also reported similar complication wherein respiratory failure accounted for 8 to 16% [8, 15], renal complication ranged from 6-7% [8, 14, 15], Multi-organ dysfunction ranging between 4% to 12% in various studies [8, 15].

The overall mortality was 2.1% in our study which is comparable to few other studies done by Surajit *et al*., Ramu *et al*. and Nitesh Negi *et al*. [8, 10, 11] Rishabh *et al*. reported a higher proportion of deaths (12.5%) among patients admitted to surgical intensive care units [12]. Though this current study included only 94 subjects, this study has established the clinical presentation, etiology and outcomes of patients with acute pancreatitis in the local setting. The findings of this study can be extrapolated to other hospitals and similar settings in the region, to help formulating hospital policies. However, the number of severe cases and mortality was less and hence the factors associated with death or severe disease could not be elucidated. This requires further studies exploring the factors linked to mortality among these patients.

Conclusion

Acute pancreatitis is a common reason for hospitalization due to acute abdomen. Alcohol use is the commonest etiology in our setting. Most of the patients were males and were aged between 20 to 40 years. Ultrasonography is the initial radiological investigation which revealed abnormality in over 80% of cases. The diagnosis of acute pancreatitis must include a careful consideration of history, examination, corroborative laboratory and radiological findings. Early diagnosis and appropriate treatment is important to prevent mortality.

References

1. Glasbrenner B, Adler G. Pathophysiology of acute pancreatitis. Hepatogastroenterology. 1993;40(6):517-21.
2. Gapp J, Chandra S. Acute Pancreatitis [Internet]. In: StatPearls. Treasure Island (FL): StatPearls Publishing, 2022. Available from: http://www.ncbi.nlm.nih.gov/books/NBK482468/
3. Li C Li, Jiang M, Pan C Qiu, Li J, Xu L Gang. The global, regional, and national burden of acute pancreatitis in 204 countries and territories, 1990-2019. BMC Gastroenterol 2021;21(1):1-12.
4. Yadav D, Lowenfels AB. The Epidemiology of Pancreatitis and Pancreatic Cancer. Gastroenterology. 2013;144(6):1252-61.
5. Márta K, Lazarescu AM, Farkas N, Mátrai P, Cazacu I, Ottóffy M, *et al*. Aging and Comorbidities in Acute Pancreatitis I: A Meta-Analysis and Systematic Review Based on

194,702 Patients. Front Physiol., 2019, 10. Available from: https://www.frontiersin.org/article/10.3389/fphys.2019.00328

6. Revised Atlanta Classification for Acute Pancreatitis: A Pictorial Essay | Radio Graphics [Internet]. [cited 2022 Apr 23]; Available from: https://pubs.rsna.org/doi/full/10.1148/rg.2016150097
7. Chatila AT, Bilal M, Guturu P. Evaluation and management of acute pancreatitis. World J Clin Cases. 2019;7(9):1006-20.
8. R R, Paul V, S D, Philip NC. Etiology, clinical profile and outcome of acute pancreatitis in a tertiary care teaching hospital in rural South India: a ten year retrospective study. Int. Surg. J. 2019;6(10):37-94.
9. SPSS Statistics-India | IBM [Internet]. [cited 2022 Apr 23]; Available from: https://www.ibm.com/in-en/products/spss-statistics
10. Negi N, Mokta J, Sharma B, Sharma R, Jhobta A, Bodh V, *et al*. Clinical Profile and Outcome of Acute Pancreatitis: A Hospital-Based Prospective Observational Study in Sub-himalayan State. Journal of the Association of the Physicians of India, 2018, 66. Available from: https://www.japi.org/r274b4b4/clinical-profile-and-outcome-of-acute-pancreatitis-a-hospital-based-prospective-observational-study-in-subhimalayan-state#introduction

    Das SK, Das S. Clinical profile of patients with acute pancreatitis in a tertiary care centre in Tripura: A retrospective study. Asian J Med Sci. 2020;11(6):96-100.
11. Sehgal R, Singh IP, Mittal J. Clinical Profile and Outcome of Patients with Severe Acute Pancreatitis: Asian J Med Res. 2020;9(3):8-11.
12. Prasad A, Sinha KK. Evaluation of the clinic-etiologic profile and outcome of acute pancreatitis: an observational study. Int. J Health Clin Res. 2021;4(2):209-13.
13. Khan PM, Amaravathi KS, Komal C. A study of clinical and etiological profile of patients with acute pancreatitis. Indian J Appl Res 8(10):3.
14. Alkareemy EAR, Ahmed LAW, El-Masry MA, Habib HA, Mustafa MH. Etiology, clinical characteristics, and outcomes of acute pancreatitis in patients at Assiut University Hospital. Egypt J Intern Med. 2020;32(1):24.