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Original Article

Factors Leading to Acute Pancreatitis in Tertiary Care Hospitals in Pakistan – A Multicenter Study

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Abstract

Background: To determine the prevalence, etiological spectrum and outcomes of acute pancreatitis patients .

Methods: In this was descriptive, observational, study patients presenting with clinical features of acute pancreatitis, increased serum amylase and/or lipase levels and/or CT scan abdomen with features suggestive of acute pancreatitis were included. Ranson's scoring was done over the first 48 hours. Contrast- enhanced CT scan abdomen with pancreatic protocol was done in selected patients. Cochrane-Armitage trend test was used to determine significance of correlation between complications and severity indices.

Results: Out of 154 patients 59.1% were female. Gall stones (74%) was the commonest aetiology, followed by idiopathic (13%). Same admission cholecystectomy was done in 44.7% of patients with gallstone pancreatitis. On admission, 14.9% of serum amylase and 18.8% (n=29) of serum lipase levels were within 3 times the upper limit of normal values. Higher Ranson's score and modified CT severity index were associated with higher complication and mortality rates. The complication rate was 21.4 % and mortality was 7.1 % .

Conclusion: Gallstone pancreatitis was found to be the most common cause. The higher rate of idiopathic pancreatitis in our study, along with higher mortality in this subgroup, could be partially explained due to lack of advanced diagnostics such as MRCP and EUS. Overall complication and mortality rate was higher for which healthcare infrastructure needs to be improved.

Key Words: Acute pancreatitis, Cholelitheasis , Ranson score

Introduction

Acute pancreatitis (AP) has been noted to have diverse etiology and treatment outcomes across various countries . It is a complex process involving inflammation of the pancreatic parenchyma of varying severity with multi-factorial etiology and at times fatal outcomes.[1] Increasing incidence of AP worldwide with 33.74 cases per 100,000 persons per year reported globally over the last few years has landed it amongst the most common gastrointestinal disorders requiring hospitalization.[2,3]

Geographic and demographic differences between and within countries have been known to influence risk factor prevalence partly explaining the variable incidence and etiology.[4] Common etiological factors include alcoholic pancreatitis with higher overall AP incidence in certain countries as compared to countries with predominantly gallstone pancreatitis.[5] The presentation of AP via emergency departments has been on the rise. In 2012, the rate of emergency department visits with AP was 105 per 100,000 persons with an overall mortality of approximately 1%.[6] Mortality rate in acute pancreatitis increases with age, comorbidities, and severity of disease, predominantly because of infected necrosis and multi-organ failure.[7]

In Pakistan, few studies have been carried out to assess the spectrum of AP in indigenous patients. Studies conducted in Karachi reported gallstones as the most common etiology and mortality ranged from 3.64% to 20% correlating with degree of necrosis.[8,9] A study from a tertiary care hospital in Islamabad reported mortality at 8.4%.[10] Data from a single unit in a tertiary care hospital in Rawalpindi revealed a mortality of 14.03 %. [11]

Patients and Methods

This was a prospective, descriptive, observational, multicenter study conducted at all surgical units of Benazir Bhutto Hospital (BBH) and Holy Family Hospital (HFH) Rawalpindi from July to December 2017. All patients presenting with clinical features of acute pancreatitis, increased serum amylase and/or lipase levels and/or CT scan abdomen with features suggestive of acute pancreatitis and/or exclusion of all other causes of upper acute abdominal pain were

included in the study. Patients with chronic pancreatitis and pancreatic cancer were excluded. Chronic pancreatitis was characterized by pain /symptoms over a longer period of time mostly 6 months with malabsorptive symptoms, diabetes, and / or weight loss. Alcoholic pancreatitis was diagnosed on a clear history of alcohol consumption before the attack of pancreatitis with no other etiological factors. Pancreatitis occurring within one week of an operative procedure or ERCP was labelled as Postoperative and ERCP pancreatitis respectively. Ranson's scoring was done over the first 48 hours. Contrast- enhanced CT scan abdomen with pancreatic protocol was done only for selected patients when diagnosis of acute pancreatitis was in doubt, or to assess severity based on patient's clinical condition and/or consultant discretion. Cochrane-Armitage trend test was used to determine significance of correlation between complications and severity indices.

Results

In six months of study period, a total of 154 patients were admitted with diagnosis of acute pancreatitis with 56 patients presenting at BBH and 98 at HFH. The mean length of hospital stay was 9.6 days (Figure 1). Gall stones was the commonest aetiology while alcoholism was seen in 2.6%. Complications were seen in 20.1% and pancreatic pseudo-cyst and pulmonary effusion were the commonest complication (Table 2) The mean age was 43.4 (±16.3) years with median serum amylase level of 623 (IQR 303 - 1234) Units/L and median serum lipase level of 522 (IQR 197 - 946) Units/L. Serum amylase levels less than 3 times the upper normal limit of 90 Units/L was found in 14.9% patients and serum lipase levels less than 3 times the upper normal limit of 50 Units/L was found in 18.8% . These cases were diagnosed as acute pancreatitis based on clinical assessment or CT scan findings. Gallstone pancreatitis had a female preponderance as evident in 65.8% of females. Complications and mortality occurred more frequently in higher severity groups according to Ranson's criteria and modified CT severity index which were available for 152 and 134 patients respectively (Table 3). Cochrane-Armitage trend test showed significant association of complications & mortality with Ranson's criteria ($p = 0.007$ and 0.001) and Modified CT Severity Index ($p < 0.001$ and < 0.001). The overall mortality rate was 7.1% , out of which 2 were secondary to pulmonary effusion, 2 were following septic shock due to infected pancreatic necrosis confirmed on exploratory laparotomy and 7 as a result of multi-organ failure. When mortality and complications were assessed against etiology, 40% (n=8) patients with idiopathic pancreatitis developed complications out of which 50% expired. In patients with gallstone pancreatitis, 17.5% developed complications out of which 25% expired.

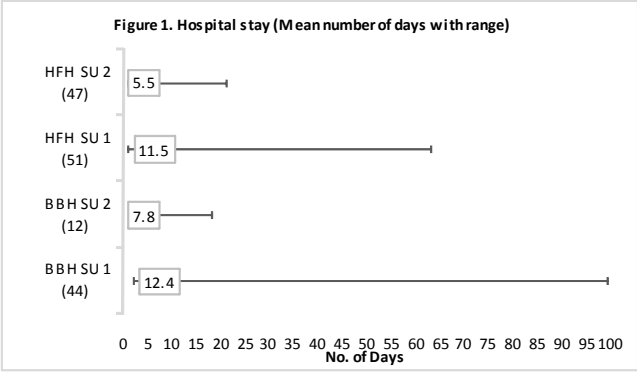

Figure 1: Hospital stay (Mean number of days with range

Table 1. Aetiology of Acute Pancreatitis with gender distribution

Aetiology	Number of patients (with % Gender Proportion)		Total Number of patients (With %) n = 154
	Male n = 63	Female n = 91	
Gallstones	39 (34.2%)	75(65.8%)	114(74.0%)
Idiopathic	13 (65.0%)	7 (35.0%)	20 (13.0%)
Post ERCP	2 (28.6%)	5 (71.4%)	7 (4.5%)
Alcohol	4 (100%)	0 (0%)	4 (2.6%)
Biliary Tract Anomaly	1 (50.0%)	1(50.0%)	2 (1.3%)
Blunt Trauma	1 (100%)	0 (0%)	1(0.6%)
Drug Induced	0 (0%)	1 (100%)	1 (0.6%)
Hypertriglyceridemia	1 (100%)	0 (0%)	1 (0.6%)
L-arginine	1 (100%)	0 (0%)	1 (0.6%)
Hypothyroidism	1 (100%)	0 (0%)	1 (0.6%)
Unknown	0 (0%)	2 (100%)	2 (1.3%)

Table 2: Acute Pancreatitis – Complications(20.1%)

Complication	Percentage
Pulmonary effusion	6.5
Pancreatic pseudocyst	6.5
Multiple organ failure	4.5
Septic shock	1.3
Thromboembolism	1.3

Discussion

This study reveals that gallstones are the most common cause of acute pancreatitis (74 %). Females are more predisposed to acute gallstone pancreatitis. These findings, as well as similar reported mean age, are in concordance with previous studies in Pakistan.[9,11] The frequency of idiopathic pancreatitis (13%) and alcoholic pancreatitis (2.6%) found in this study

Table 3: Outcomes according to severity of acute pancreatitis

Severity (% Predicted Mortality)	Total	Complications (within severity group)	Mortality (within severity group)
Ranson's Criteria (n=152)			
0-2 (1%)	74 (48.7%)	13 (17.6%)	3 (4.1%)
3-4 (16%)	55 (36.2%)	10 (18.2%)	2 (3.6%)
5-6 (40%)	18 (11.8%)	6 (33.3%)	4 (22.2%)
7-11 (100%)	5 (3.3%)	4 (80%)	2 (40.0 %)
Modified CT Severity Index (n = 134)			
Mild 0-2 (3%)	36 (26.9%)	3 (8.3%)	0 (0%)
Moderate 4-6(6%)	76 (56.7%)	13 (17.1%)	2 (2.6%)
Severe 8-10 (17%)	22 (16.4%)	16 (72.8%)	8 (36.4%)
Cochran-Armitage trend test was significant for Complications & Mortality according to Ranson's criteria & Modified CT Severity Index with p values of 0.007, 0.001, < 0.001 & <0.001, respectively.			

was in contrast to previous studies which reported 1 to 3% as idiopathic and up to 8% as alcoholic pancreatitis.[9,10] This higher percentage of idiopathic pancreatitis, even though within 20% universal value can be attributed to the fact that Magnetic Resonance Cholangiopancreatography (MRCP) is infrequently performed at our setup due to unavailability and lack of affordability. [12] Therefore, pancreaticobiliary anomalies may have been missed in some patients.[13]

Recent studies have shown that a substantial number of idiopathic labeled pancreatitis are essentially a consequence of microlithiasis and / or biliary sludge for which Endoscopic Ultrasound (EUS) was found to have the highest diagnostic accuracy, even when compared to MRCP and endoscopic retrograde cholangiopancreatography (ERCP). [14] This could possibly mean mislabeled microlithiasis pancreatitis as idiopathic, which is a cause for concern considering the high complication and mortality rate in this etiological group of pancreatitis in our study which is in agreement with international studies.[15]

We had a lower rate of index admission cholecystectomy (44.7%) as compared to other centers in Pakistan with one center reporting up to 75% of gallstone pancreatitis having index admission cholecystectomy, which is now routinely recommended in mild gallstone pancreatitis, due to lower recurrent gallstone-related complications. It is particularly recommended in countries where there is an increased chance of patients being lost to follow up treatment. [16-18]

A relatively large number of patients with less than 3 times the upper normal limit serum amylase and lipase in our study, merits the need for further research in initial laboratory biomarkers.[19] It has been reported that assay of lipase alone has a better sensitivity and specificity than assay of amylase.[20] Keeping in view the fact that assay of lipase is not widely available in hospitals in Pakistan, it is prudent to have a lower threshold to order an abdominal CT scan to confirm the diagnosis on clinical suspicion of acute pancreatitis. [21,22]

Our complication and mortality rates were unacceptably higher as compared to developed countries but fell in the range of developing countries such as India, where a recent study reported a mortality rate of 10.1%. [23,24] This can be explained by the limited availability of ICU beds; lack of advanced diagnostics such as MRCP, EUS and round the clock ERCP facilities and lack of health awareness and infrastructure. Compliance with guidelines on management can improve outcomes. [25]

Conclusion

1.Acute pancreatitis has multifactorial etiology with diverse severity and outcomes . Gallstones were the most common etiological factor.

2.A higher mortality was observed in pancreatitis of idiopathic etiology. Over all complication and mortality rate was high as compared to literature from developed countries. It emphasizes the need of up-to-date facilities and infrastructure to improve treatment outcomes in this life-threatening disease in our setup.

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