Left Pleural Effusion As A Sign of Acute Necrotizing Pancreatitis

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ABSTRACT

Objective — *To find out the frequency of left pleural effusion in acute necrotizing pancreatitis.*

Study design — *Case series.*

Place & Duration of study — *Surgical Unit 1, Jinnah Postgraduate Medical Center Karachi, from April 2017 to April 2020.*

Methodology — *Patients diagnosed as acute pancreatitis, above 12 years of age of either gender with serum amylase more than 300U/dL were included. X-ray chest, CT scan, and other routine biochemical investigations were done. Diagnosis of necrotizing pancreatitis was made on CT scan findings. Frequency of left pleural effusion on x-ray chest and findings of necrotizing pancreatitis on CT scan were noted. Data was collected and analysed using SPSS version 25.*

Results — *A total of 110 patients of acute pancreatitis were included. Eighty (72.27%) patients were female and 30 (27.27%) male. Seventy (63.63%) patients were diagnosed as having non-necrotizing pancreatitis and forty (36.36%) necrotizing pancreatitis. Thirty-nine patients (97.5%) of necrotizing pancreatitis had left pleural effusion on x-ray chest and two (2.85%) patients with non-necrotizing pancreatitis had similar findings.*

Conclusion — *Patients of acute necrotizing pancreatitis are more likely to develop left pleural effusion which may be considered an additional sign of severity of disease.*

Key words — *Acute necrotizing pancreatitis, Non-necrotizing pancreatitis, Pleural effusion*

INTRODUCTION:

Acute necrotizing pancreatitis occurs in 20% of patients with acute pancreatitis.[1] It is associated with organ failure in 45% of patients.[2] In a study, mortality in infected necrotizing pancreatitis was reported as 26.67% while in sterile necrotizing pancreatitis as 4%, and all patients who died had more than 50% necrosis of pancreas.[3] Mortality with infection can be up to 43% and without surgical intervention can reach 100%.[4] It is essential to stratify cases of acute pancreatitis according to the degree of severity as patients who develop severe necrotizing pancreatitis require early and aggressive management.[5] Early diagnosis and intervention can decrease the mortality rate.[6]

Pleural effusion can occur in up to 20% of patients of acute pancreatitis.[7] Pleural effusion is usually absent in mild pancreatitis. The association of pleural effusion with severe pancreatitis is a well-recognized entity.[8,9] Pleural effusion as a result of acute pancreatitis is transient and usually left-sided.[10] Two proposed causes of pleural effusion are blockage of lymphatics and formation of pancreatico-pleural fistula secondary to disruption of pancreatic duct. When pancreatitis gets resolved, pleural effusion also settles. Pleural effusion is associated with severe

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pancreatitis and is an indicator of poor outcome.[11] Pancreatitis is mostly due to impacted stone at lower end of common bile duct. Stone extraction can prevent many complications.[12]

X-Ray chest is a low cost investigation and can be done in district hospitals where CT scan is not routinely available. Pleural effusion may indicate severity of disease. This can help in initiating aggressive resuscitation and rapid referral to tertiary centre where intensive care monitoring and multidisciplinary team is available to manage the patients.

METHODOLOGY:

It was a case series conducted in ward 3, Surgical Unit - I of Jinnah Postgraduate Medical Centre Karachi, from April 2017 to May 2020. Patients from 13 years to 80 years of age diagnosed as acute pancreatitis were included in the study. Patients with the history of chronic cough, tuberculosis and COPD, were excluded. Patients presented to emergency department with one or more symptoms indicating acute pancreatitis including upper abdominal pain radiating to back, nausea, and vomiting were enrolled. Informed consent was obtained after IRB approval.

Patients were examined in ER and pulse, temperature, blood pressure, respiratory rate and abdominal findings were recorded. Investigations including serum calcium, serum amylase, liver function tests, blood complete panel, urea, creatinine, x-ray chest, urine detailed report were done. Patients with serum amylase level more than three times the normal limit were labelled as having acute pancreatitis. Vitally stable patients were provisionally kept in mild pancreatitis category, and unstable patients as having severe pancreatitis. Patients were admitted to the inpatient department and CT scan abdomen with pancreatic protocol was done in patients enrolled in this study within first 7 days of the admission. Diagnosis of advanced disease was made if CT scan showed pancreatic necrosis. Chest radiographs were obtained to find out presence of pleural effusion. Findings were recorded on pre designed form.

All patients of acute pancreatitis were resuscitated and treated. Endoscopic retrograde cholangiopancreaticography was done in patients of acute pancreatitis with stone at lower end of common bile duct. If infection was suspected on the basis of CT findings, fluid was aspirated and sent for culture and sensitivity. If the results of microbiological analysis showed bacterial growth then exploratory laparotomy with necrosectomy was done. Frequency of left pleural effusion with necrotizing pancreatitis and non-necrotizing pancreatitis was noted. Mortality was also recorded. SPSS version 25 was used for data entry. Descriptive statistics were used to present the findings.

RESULTS:

A total of 110 patients of acute pancreatitis were included in the study. Eleven (10%) patients were 13-20 years of age, 22 (20%) of 21-30 years, 27 (24.5%) 31-40 year and 39 (35.45%) of 41-50 years. Eighty (72.27%) patients were female, and 30 (27.27%) male. Seventy (63.63%) patients were diagnosed as non-necrotizing pancreatitis and forty (36.36%) as necrotizing pancreatitis. Thirty-nine (97.5%) patients of necrotizing pancreatitis had left pleural effusion on x-ray chest and two (2.5%) with non-necrotizing pancreatitis had similar radiological findings.

Ninety (81.81%) patients had cholelithiasis. Eleven patients diagnosed as having necrotizing pancreatitis died due to multi-organ failure. Mortality rate was 10% among all patients diagnosed with acute pancreatitis and 27.5% among the subgroup of patients diagnosed with necrotizing pancreatitis. Two (5%) patients out of 40 patients of necrotizing pancreatitis developed pancreatic fistula after necrosectomy. Table I shows x-ray chest findings in patients with acute pancreatitis.

DISCUSSION:

Necrotizing pancreatitis is a severe form of pancreatitis and if gets infected may result in multiple complications and mortality. Most common cause of acute pancreatitis in this study was cholelithiasis. Mortality rate among patients with infected necrotizing pancreatitis and concomitant organ failure is reported to be 35.2%. In patients with sterile necrotizing pancreatitis with organ failure mortality

Table I: Frequency of Acute Pancreatitis and Left Pleural Effusion

Acute Pancreatitis	Number of Patients (n)	Left Pleural Effusion (n)	Percentage (%)
Necrotizing Acute Pancreatitis	40	39	97.5
Non-necrotizing Acute Pancreatitis	70	2	2.85
Total	110	41	37.27

rate among necrotizing pancreatitis without organ failure is reported to be 1.4%.[13]

CT scan criteria of acute pancreatitis is A: Normal pancreas = 0 score, B: Enlargement of pancreas= 1 score, C: Inflammatory changes in pancreatic fat = 2 score, D: Single pancreatic fluid collection = 3 score, E: Two or more pancreatic fluid collections = 4; pancreatic necrosis: none=0, 30%=2, 30-50%= 4 and >50%=6.[14] If patient gets a score of more than 6, it is a case of severe pancreatitis. Most of the cases of severe pancreatitis have associated significant pancreatic necrosis and the extent of necrosis has a relationship to the severity of pancreatitis.[15] For such patients, admission to surgical intensive care unit is needed.

Surgical intervention is indicated in infected necrotizing pancreatitis to remove the dead tissues. X-ray chest can be done in a set-up where CT scan facility is not available. If chest radiograph shows pleural effusion, earlier referral to tertiary centre is mandatory. In a tertiary care set-ups diagnostic as well as interventional facilities like ERCP may help in removing the calculus at lower end of common bile duct if that is a cause of acute pancreatitis as well as necrosectomy may be performed by surgical team. In this study left pleural effusion was present in 97.5% of patients with necrotized pancreatitis. CT scan is usually not done in mild pancreatitis, so necrosis might be missed. CT scan must be advised in mild pancreatitis cases as well.

Acute necrotizing pancreatitis is a life-threatening condition so early diagnosis and close monitoring is essential. Early diagnosis can prevent the infection of necrosed tissue. Infective necrosis needs surgical intervention. Endoscopic necrosectomy offers the advantage of internal drainage.[16] Assessment of severity of pancreatitis is important for transfer to specialist centre unit. Acute physiology and chronic health evaluation is scoring system for early diagnosis of necrotizing pancreatitis which has high mortality.[17] In this study pleural effusion is one of the most important radiological findings that may predict severity of the condition and necrotizing pancreatitis may be suspected in these patients which has a high mortality. Limitation of this study includes the small sample size and without statistical tests support. Further studies can be conducted to evaluate the predictive role of left pleural effusion in assessing severity of acute pancreatitis.

CONCLUSIONS:

Majority of the patients with necrotizing pancreatitis had left sided pleural effusion. Thus patients diagnosed on the basis of high serum amylase as having acute pancreatitis can be referred earlier to tertiary care unit on the basis of left pleural effusion as a measure of predictor of severity.

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