

Frequency of Left Plueral Effusion in Acute Necrotizing Pancreatitis

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ABSTRACT

Objective: The aim of this study is to calculate the prevalence of left plueral effusion in acute necrotizing pancreatitis.

Study Design: Observational/ case series

Place and Duration: Conducted at surgery department of Saidu Teaching Hospital, Swat and Ibne Sina Hospital and Research Institute, Multan for duration of six months from January 2021 to June 2021.

Methods: A total of 95 patients, both males and females, ranging in age from 15 to 65 years, were presented. After receiving informed written consent, the baseline comprehensive demographics of the patients presented were recorded, including age, gender, and body mass index. Patients with acute pancreatitis and serum amylase levels greater than 300U/dL were eligible to participate. Patients were subjected to X-ray and CT scans in their entirety. Prevalence of necrotizing pancreatitis was calculated by CT scan and for left plueral effusion X-ray of chest was taken. SPSS 24.0 version was used to analyze complete data.

Results: Majority of the patients 65 (68.4%) were females and 30 (31.6%) were males with mean age 39.14±5.67 years. 26 (27.4%) cases had BMI less than 20kg/m² and the majority were >20kg/m². Gallstone was the most common cause of acute pancreatitis found in 45 (47.4%) cases, followed by alcoholism 25 (26.3%) and medications 12 (12.6%). Among 95 cases, prevalence of necrotizing pancreatitis was 42 (44.2%) in which 40 cases had left plueral effusion. Mortality rate among necrotizing pancreatitis was 13 (33.3%).

Conclusion: We found that the majority of individuals with necrotizing pancreatitis experienced pleural effusion on the left side. Thus, patients with acute pancreatitis who have a high serum amylase level must be treated earlier if they have a left pleural effusion because of severity.

Keywords: Plueral Effusion, Acute Necrotizing Pancreatitis, Mortality

INTRODUCTION

Inflammation of the pancreas and surrounding tissues is the hallmark symptom of acute pancreatitis, which can be brought on by a wide range of causes. Inappropriately activated pancreatic enzymes cause the pancreas and surrounding tissue to be digested. It is possible that this necrotic and inflammatory process will spread to other organs, ending in multiple organ failure and death. [1] At the Atlanta Symposium in 1992, based on clinical and biochemical findings, acute pancreatitis was divided into two categories: "mild" and "severe." [2]

"Acute Pancreatitis Classification Working Group" changed this classification in 2008, creating a new imaging-based classification. Acute pancreatitis has been split into two categories: "interstitial edematous pancreatitis" and "necrotizing pancreatitis." When a disease is defined as mild, moderate, or severe, it is based on whether or not there are any organ failures or fluid accumulations and other concomitant disorders present in the patient. [3-5]

It is possible for acute pancreatitis to result in local or distant complications, as well as immediate or delayed consequences. Old age, gallstones, the presence of organ failure, and pancreatic necrosis all raise the risk of problems. [6] Disease complications and severity are mostly determined by pancreatic necrosis, according to experts. Inflammation in the pancreas is classified using the modified CT severity index (MCSI) based on the CT appearance. [7] Using the percentage of necrosis, the

degree of fluid collections, and involvement of the extrapancreas, this score is calculated. It has been proved to be accurate in predicting the onset of problems. [8]

Patients with acute pancreatitis are at an increased risk of developing severe acute pancreatitis (SAP), which affects up to 20% of patients. MSOF has been linked to high fatality rates in the early stages of the disease [9]. Acute pancreatitis is defined as having at least one organ failure on admission, and over 80 percent of patients with MSOF develop or advance despite intensive care treatment [10]. This group has a death rate of 42 percent, compared to just 12 percent in individuals with SAP without organ failure. The death rate from progressive organ failure ranges from 35% to 55% [12].

One of the most common systemic signs of SAP is pulmonary dysfunction ranging from hypoxemia to acute respiratory distress syndrome (ARDS). [13] In 22-25 percent of patients with AP, pulmonary dysfunction is the leading cause of death, and in another 30 percent of those patients, it is a contributory factor [14]. Early death in SAP patients can be attributed to respiratory dysfunction that precedes the onset of heart, liver and kidney failure. 60% of patients with acute pancreatitis died within 7 days of being admitted, with respiratory failure being the primary cause of death in that study's autopsy findings. An independent predictor of the severity of AP is reported to be an oxygen saturation of 92 percent or lower, which is found in 44 percent of patients with SAP. SAP is identified by the

presence of pleural effusion, hypoxemia, and pulmonary infiltrates [12, 13]. A 15-fold increase in mortality was found in a logistic regression analysis of chest radiological abnormalities [15].

Purpose of our study was to diagnose the prevalence of left plueral effusion and its complications in acute necrotizing pancreatitis.

MATERIAL AND METHODS

This observational/case series was conducted at surgery department of Saidu Teaching Hospital Swat and Ibne Sina Hospital and Research Institute, Multan for duration of six months from January 2021 to June 2021. The study was comprised of 95 patients. Informed written consent was taken from all the individuals for detailed demographics. Patients having COPD, tuberculosis, chronic cough, pregnancy and those did not give any written consent were excluded.

Age of the patients was between 15-65 years. In the emergency room, the patient's pulse, temperature, blood pressure, respiratory rate, and abdominal findings were all recorded. Tests were performed on serum calcium, serum amylase, liver function tests, the blood complete panel, urea, creatinine, an x-ray of the chest, and a urine detailed report, among other things. Patients with a blood amylase level larger than three times the normal range were found to have acute pancreatitis, according to the research. In the case of moderate pancreatitis, patients who were critically stable were classified as such, but those who were in unstable condition were classified as having severe pancreatitis. As a part of this study, patients were admitted to the inpatient department and had CT scans of the abdomen performed using a pancreatic protocol within the first seven days of their hospitalisation. If a CT scan indicated pancreatic necrosis, the patient was diagnosed with a more serious illness than before. Chest radiographs were obtained in order to assess whether or not there was a pleural effusion.

In patients with acute pancreatitis and a stone at the lower end of the common bile duct, endoscopic retrograde cholangiopancreatography was performed. Fluid was aspirated and sent for culture and sensitivity testing if infection was suspected based on CT results. If bacterial growth was detected by microbiological analysis, an exploratory laparotomy with necrosectomy was performed. Frequency of left plueral effusion was calculated. SPSS 24.0 version was used to analyze complete data.

RESULTS

Majority of the patients 65 (68.4%) were females and 30 (31.6%) were males with mean age 39.14+5.67 years. 26 (27.4%) cases had BMI less than 20kg/m² and the majority were >20kg/m². Gallstone was the most common cause of acute pancreatitis found in 45 (47.4%) cases, followed by alcoholism 25 (26.3%), medications 12 (12.6%), hypertriglyceridemia in 7 (7.4%) and 6 (6.3%) was hypercalcemia.(table 1)

Among 95 cases, prevalence of necrotizing pancreatitis was 42 (44.2%) and the rest were 53 (55.8%) was non-necrotizing pancreatitis.(table 2)

We found that frequency of left plueral effusion was significantly higher in 40 (95.2%) cases. Among 40 cases

of pleural effusion lung damage was found in 18 (45%) cases, empyema in 12 (30%), pneumothorax in 7 (17.5%) and pleural thickening in 3 (7.5%).(table 3)

Table 1: Characteristics of presented cases

Characteristics	Variables	%age
Mean age (years)	39.14+5.67	
Body Mass index		
<20 kg/m ²	26	27.4
>20 kg/m ²	69	72.6
Gender		
Male	65	68.4
Female	30	31.6
Causes		
gallstone	45	47.4
alcoholism	25	26.3
medications	12	12.6
hypertriglyceridemia	7	7.4
hypercalcemia	6	6.3

Table 2: Prevalence of necrotizing pancreatitis among patients

Characteristics	Variables (95)	%age
Necrotizing pancreatitis		
Yes	42	44.2
No	53	55.8

Table 3: Prevalence of left pleural effusion in necrotizing pancreatitis

Characteristics	Variables (42)	%age
Left Plueral Effusion		
Yes	40	95.2
No	2	4.8
Complications		
lung damage	18	45
empyema	12	30
pneumothorax	7	17.5
pleural thickening	3	7.5

Mortality rate among necrotizing pancreatitis was 13 (33.3%).(table 4)

Table 4: Mortality rate among enrolled cases

Characteristics	Variables (40)	%age
Mortality		
Yes	13	33.3
No	27	66.7

DISCUSSION

Pancreatic inflammation and the destruction of acinar cells are hallmarks of acute pancreatitis (AP) [16]. Diagnosing AP necessitates the presence of two of the following three criteria: Pancreatitis can be diagnosed by a patient's symptoms, as well as biochemical proof (serum amylase and/or lipase larger than three times the usual limit). [17]

Infected necrotizing pancreatitis can lead to a wide range of complications and even death, making it a particularly dangerous form of pancreatitis. Acute pancreatitis was most commonly caused by cholelithiasis in this research. Infected necrotizing pancreatitis and organ failure are connected with a 35.2 percent death risk. When compared to necrotizing pancreatitis without organ failure, sterile necrotizing pancreatitis with organ failure has a mortality rate of 1.4 percent. [18]

In this study 95 patients of both genders with ages 15-

65 years were included. Majority of the patients 65 (68.4%) were females and 30 (31.6%) were males with mean age 39.14±5.67 years. 26 (27.4%) cases had BMI less than 20kg/m² and the majority were >20kg/m². Findings of our study was comparable to the studies conducted in past.[19,20] Gallstone was the most common cause of acute pancreatitis found in 45 (47.4%) cases, followed by alcoholism 25 (26.3%), medications 12 (12.6%), hypertriglyceridemia in 7 (7.4%) and 6 (6.3%) was hypercalcemia.[20,21] Acute necrotizing pancreatitis is a potentially fatal condition, it is vital to get it recognized and monitored as soon as possible. Infection of necrosed tissue can be avoided if detected early. Infective necrosis requires surgery to be treated. With endoscopic necrosectomy, internal drainage is possible. [22] Among 95 cases, prevalence of necrotizing pancreatitis was 42 (44.2%) and the rest were 53 (55.8%) was non-necrotizing pancreatitis.[19] We found that frequency of left pleural effusion was significantly higher in 40 (95.2%) cases. Among 40 cases of pleural effusion lung damage was found in 18 (45%) cases, empyema in 12 (30%), pneumothorax in 7 (17.5%) and pleural thickening in 3 (7.5%).[19-23]

Most effusions are mild to moderate and occur on the left side of the body. These left-sided effusions are typically chemically produced or sympathetic in nature when fluid amylase levels are normal. It is rare for chronic pancreatitis to generate pleural effusions, however this is mainly due to the development of pancreatic fistulas. [24] A chest radiograph is the primary imaging modality used to evaluate pleural effusion in patients with pancreatitis. As a result, mild to moderate effusions may be missed due to the patient's supine position and inability to maintain proper posture. When it comes to detecting even a little pleural effusion in the intensive care unit, ultrasonography is the most sensitive tool and is also the most accessible. Infection can be suspected if septations and internal echoes are detected during an ultrasonography. As sensitive as chest CT scans are in detecting even minute quantities of fluid in pleural space, they are rarely used to make this diagnosis. A thickening pleural wall separates infected effusions from each other on CT scans ("split pleura sign"). [25] In our study mortality rate was 13 (33.3%) which is comparable to the researches conducted previously.[19,26,27]

CONCLUSION

We found that the majority of individuals with necrotizing pancreatitis experienced pleural effusion on the left side. Thus, patients with acute pancreatitis who have a high serum amylase level must be treated earlier if they have a left pleural effusion because of severity.

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