

## Clinical profile, degree of severity and underlying factors of acute pancreatitis among a group of Bangladeshi patients

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### Abstract

**Background and objectives:** Acute pancreatitis is a common condition for hospital admission. In Bangladesh, no study has yet investigated the clinical profile, degree of severity and underlying factors of acute pancreatitis. The aim of the present study was to determine the clinical profile, degree of severity and underlying factors of acute pancreatitis in a cohort of Bangladeshi patients.

**Methods:** This prospective study was conducted from April 2016 to March 2017 on patients admitted with acute pancreatitis at Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM) General Hospital, Dhaka, Bangladesh. History and clinical features of each patient was systematically recorded. Diagnosis of acute pancreatitis was made by clinical findings, serum amylase and lipase levels (> 3 times the upper limit of normal values), evidences of acute pancreatitis by ultrasonography and computed tomography (CT). Severity of acute pancreatitis was classified according to the revised version of Atlanta classification.

**Results:** A total of 40 patients with acute pancreatitis were enrolled in the study. Male and female were equally distributed. The mean age was  $44.3 \pm 2.7$  years. Among 40 cases, 26 (65.0%) and 14 (35%) had moderate and severe acute pancreatitis respectively. No specific clinical feature including ascites or pleural effusion was found significantly related to severity of the disease. Gall stone and metabolic (hypertriglyceridaemia/hypercalcemia) causes were present in 62.5% cases, but none had significant association with the severity of the disease.

**Conclusion:** The present study has demonstrated that no specific observed clinical feature or underlying factor was related to the degree of severity of acute pancreatitis in a cohort of Bangladeshi patients.

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### Introduction

Acute pancreatitis is a medical emergency and is one of the most common gastrointestinal conditions for hospital admission. The reported annual incidence of acute pancreatitis is 13 to 45 per 100,000 populations in different countries of the world [1]. The risk, clinical features and severity of acute pancreatitis differ with age, sex, life style and presence of co-morbidities. Of the many complications, ascites and pleural effusion are important complications related to the severity of the disease [2,3,4]. So far, no systematic study has

investigated the clinical profile, degree of severity and underlying factors of acute pancreatitis among Bangladeshi patients. Therefore, the present study has attempted to determine the rate of different grades of severity of acute pancreatitis and their associated clinical features in a group of Bangladeshi patients.

### Materials and Methods

The present prospective study was performed from April 2016 to March 2017 at the BIRDEM General

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Hospital, Dhaka, Bangladesh. All patients aged 18 years or more, diagnosed as a case of acute pancreatitis, were included in study. Informed consent was obtained from each participant.

Diagnosis of acute pancreatitis was made by clinical findings, serum amylase and lipase levels more than 3 times the upper limit of normal value as well as by evidences of acute pancreatitis by ultrasonography and computed tomography (CT). Ultrasonography and CT scan were performed in all patients within 3 and 4 days of admission respectively. Abdominal ultrasonography was repeated when clinically indicated during hospitalization and 1 month after leaving the hospital. X-ray chest was done in all patients. Ascites and pleural effusion were diagnosed accordingly. Organ failure was diagnosed when shock, pulmonary insufficiency, renal failure and gastrointestinal bleeding were present. Presence of pancreatic necrosis, abscess and pseudocyst were recorded. Severity of acute pancreatitis was classified according to the revised version of Atlanta classification [5]. Moderately severe acute pancreatitis was diagnosed based on the presence of local complication and/or transient organ failure (<48 hours). Severe acute pancreatitis was defined as patients having persistent single or multiple organ failure for >48 hours – systolic blood pressure  $\leq 90$  mmHg or  $\text{PaO}_2 < 60\%$  or serum

creatinine  $\geq 2$ mg/dl [5]. Patients having ascites and pleural effusion due to cardiac, pulmonary and liver diseases and having other severe co-morbid condition were excluded from this study. Detailed history and biochemical parameters were recorded in a predesigned data sheet for determining possible etiological factors of acute pancreatitis. Gall stone pancreatitis was diagnosed if serum alanine aminotransferase level was more than 3 times the upper limit of normal value and/presence of gall stone in gallbladder or bile duct. Metabolic pancreatitis was diagnosed if serum triglyceride level was more than 1000 mg/dl or hypercalcemia was present [6]. The significance of association of clinical features with severity of pancreatitis was tested by chi-square and other appropriate statistical tests.

## Results

A total of 40 acute pancreatitis patients were enrolled in the study. Of the 40 cases, 19 (47.5%) and 21 (52.5%) were male and female respectively and the mean age was  $44.25 \pm 2.7$  years. Among them, 26 (65.0%) and 14 (35%) had moderate and severe acute pancreatitis respectively. The mean age of patients with severe acute pancreatitis ( $59.1 \pm 16.2$  years) was significantly higher ( $p < 0.01$ ) than that of cases with moderately severe

**Table-1:** Demographic and clinical profile of patients with moderate (n=26) and severe (n=14) acute pancreatitis

Parameters	Moderately severe case (n=26)	Severe case (n=14)	Total cases (n=40)
	Number (%)	Number (%)	Number (%)
Male	11(42.3%)	8 (57.1%)	19 (47.5%)
Female	15 (57.7%)	6 (42.9%)	21(52.5%)
Upper abdominal pain	26(100%)	14(100%)	40(100%)
Vomiting	22(84.6%)	13(92.8%)	35(87.5%)
Fever	7(26.9%)	3(21.4%)	10(25%)
Ascites	6(23%)	6(42.8%)	12(30%)
Pleural effusion*	6(23%)	7(50%)	13(32.5%)
DM	20(76.9%)	12(85.7%)	32(80%)
Pancreatic pseudo cyst	1(3.8%)	1(7.1%)	2(5.0%)

Note: \*In moderate pancreatitis: 2 left sided, 4 bilateral. In severe pancreatic: 3 left sided, 1 right sided, 3 bilateral. Z test was performed to compare between moderate and severe cases: Male vs female-  $Z = 0.8962$ ,  $p = 0.3681$ ; Compared between and within moderate and severe groups: Male vs female-  $Z = 0.8962$ ,  $p = 0.3681$  and  $Z = 1.109$ ,  $p = 0.267$ ; Moderate vs Severe: Ascites-  $Z = 1.3021$ ,  $p = 0.1936$ ; Pleural effusion-  $Z = 1.734$ ,  $p = 0.083$

pancreatitis ( $36.2 \pm 11.5$  years). Duration of hospital stay of patients with moderately severe acute pancreatitis cases ( $6.5 \pm 2.0$  days; 95% CI: 5.6-7.3) was significantly ( $p < 0.01$ ) less compared to those with severe pancreatitis ( $9.4 \pm 5.1$  days; 95% CI: 6.5 - 12.3). The overall mean hospital stay for all acute pancreatitis cases was  $7.5 \pm .6$  days.

Detail clinical profile of study population is shown in Table-1. The most common presentations of both moderate and severe acute pancreatitis were upper abdominal pain (100%) and vomiting (84.6% and 92.8%). Among the patients, ascites and pleural effusion were present in 30% (12/40) and 32.5% (13/40) respectively. Pleural effusions was bilateral in 7 (53.8%), left sided in 5 (38.46%) and right sided in 1 (7.69%). Bilateral pleural effusion was present in 21.4% and 15.4% cases with severe and moderately severe pancreatitis cases. No significant differences ( $p > 0.05$ ) were observed regarding occurrence of either ascites or pleural effusion in moderately severe and severe acute pancreatitis cases (ascites: 23% vs. 42.8%; pleural effusion: 23% vs. 50%). Both ascites and pleural effusion were together present in 11.5% and 35.5% patients with moderate and severe acute pancreatitis respectively ( $p = 0.06$ ). Ascites disappeared in all surviving patients before they were released from the hospital. Two patients were discharged from the hospital with pleural effusion but the effusion disappeared within one month. Leukocytosis was present in 19.2% and 57.1% cases with moderate and severe acute pancreatitis respectively. Only one patient died due to pancreatic necrosis and respiratory distress syndrome.

**Table-2:** Etiology or underlying factor in cases with moderate and severe acute pancreatitis

Etiology/ Underlying factors	Moderately severe acute pancreatitis n (%)	Severe acute pancreatitis n (%)	Total n (%)
Gall stone <sup>a</sup>	4(15.3%)	6(42.8%)	10 (25.0)
Metabolic cause <sup>b</sup>	12(46.1%)	3(21.4%)	15 (37.5)
Alcohol	4(15.3%)	1(7.1%)	5 (12.5)
Idiopathic	6(23.0%)	4(28.5%)	10 (25.0)
Total	26 (65.0)	14(35.0)	40

Note: <sup>a</sup>Gall Stone pancreatitis:  $\chi^2 = 3.663$ ,  $p = .06$ ;

<sup>b</sup>Metabolic cause:  $\chi^2 = 2.3736$ ,  $p = 0.12$ .

In this study, gallstones was associated with 15.3% and 42.8% patients with moderate and severe acute pancreatitis respectively; while metabolic syndrome was present in 46.1% and 21.4% cases respectively (Table-2). History of alcohol consumption was present in 15.3% patient with moderate acute pancreatitis and 7.1% in severe acute pancreatitis. No underlying cause was found (idiopathic) in 23% and 28.5% cases in both groups. None of the underlying factors were found significantly associated with the severity of acute pancreatitis.

## Discussion

The present study has attempted to determine the rate of different grades of severity of acute pancreatitis and their associated clinical features in a group of Bangladeshi patients. In this study, 65% of patients had a moderately severe and 35% had severe acute pancreatitis. Other studies reported the rate of severe acute pancreatitis as 21% to 25% [7,8]. The higher rate of severe pancreatitis in our patients could be due to delay in early intervention, food habits and underlying predisposing factors like diabetes mellitus. About 80% of our cases had diabetes mellitus of different duration.

Out of our 40 cases, male and female were equally affected. Similar observation has also been reported by other investigators [9,10,11]. As reported by others [12], upper abdominal pain (100%) and vomiting (87.5%) were the most common clinical features. Ascites is a well known complication of acute pancreatitis. In our study, there was no significant difference of occurrence of ascites among moderate and severe acute pancreatitis cases though 42% severe cases had ascites compared to 23% in moderately severe cases. Studies elsewhere have reported the rate of ascites in severe pancreatitis cases from 18% to 60% [13,14]. Similarly, in the present study, we were unable to find any significant association of pleural effusion with the severity of acute pancreatitis though the rate of pleural effusion was much higher (23% and 50%) in our study than those (4% to 17%) reported by other studies [15,16]. In both moderate and severe disease, the majority of effusions were bilateral. Thus the site of pleural effusion offers no additional diagnostic

information [17]. Perhaps studies large number of cases with stringent case selection criteria is needed to ascertain whether ascites and pleural effusion can be used as diagnostic criteria for severe acute pancreatitis.

We tried to determine the underlying predisposing factors of acute pancreatitis in our cases. In the present study, metabolic cause was found to be the most common cause of acute pancreatitis (37.5%), followed by gallstone disease. Among the severe acute pancreatitis cases, we found gallstone disease as the most common cause (42.8%). One fourth of our cases were idiopathic. However, it is to be noted that over 80% of our cases had diabetes mellitus of different duration and, therefore, the presence of such co-morbid condition and use of certain anti-diabetic drugs might play a role in its pathogenesis [1]. However, we could not find any significant association of these factors with severity of the disease.

The present study has demonstrated the frequency of severity and the clinical profiles of moderately severe and severe variety of acute pancreatitis among a cohort of Bangladeshi patients. Study with larger number of cases may be required to determine the specific underlying factor(s), predictive or prognostic criteria for different grades of acute pancreatitis in our population.

#### Author's contributions

IKD was involved in case enrollment, management and manuscript writing; MNH and TMB did overall supervision.

#### Competing interest

Authors declare no conflict of interest.

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