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Clinical Profile and Outcomes in Patients with Acute Pancreatitis Attending a Teaching Hospital at Gandaki Province, Nepal

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ABSTRACT

Background: Acute pancreatitis (AP) is inflammatory process of pancreas presenting with acute abdominal pain. The majority of patients have mild disease. Some patients develop local and systemic complications with increased morbidity and mortality. This study was undertaken to describe the clinical profile and outcomes in patients with acute pancreatitis.

Methods: A cross-sectional hospital based study comprising of 62 consecutive patients with acute pancreatitis were enrolled between Jan 2019 to June 2020. Clinical profile at admission, complications and clinical outcomes including mortality were studied. Patients were classified into mild, moderately severe and severe acute pancreatitis based on revised Atlanta classification and modified CT severity index. Data entry was done in Statistical Packages for the Social Sciences version 20.

Results: The mean age of study subjects was 44±10.87 years with 43 (69.4%) males and 19 (30.6%) females (M:F=2.3:1). The commonest etiology of pancreatitis was alcohol (53.2%) followed by biliary pancreatitis (37.1%) The most common presentation was abdominal pain (100%). The most common complication was pancreatic necrosis (21%) followed by acute kidney injury (19.4%) and pleural effusion (17.3%). Majority (72.6%) was mild and 17.7% had severe acute pancreatitis. Mortality was seen in 6.5% patients. Mortality was observed in patients with persistent complications, organ failure, low serum calcium and high modified CT severity index.

Conclusions: Alcohol and gallstones were the two main etiologies of acute pancreatitis and were common in males, and in middle age groups. Majority presented with mild severity. Mortality was observed in some patients with severe acute pancreatitis.

Keywords: alcohol; biliary; CT severity index; mortality; outcome; pancreatitis.

INTRODUCTION

Acute pancreatitis (AP) is an acute inflammatory process of pancreas and is an important cause of acute abdominal pain.[1,2] The majority of patients with mild disease recover completely, whereas approximately 15–20% of patients develop local and systemic complications with increased mortality up to 20–30%.[3]

The American College of Gastroenterology and the revised Atlanta classification state that the presence of at least two of the following three features are required for diagnosis of acute pancreatitis: 1)characteristic abdominal pain, 2) elevation of pancreatic enzymes in the serum to at least three times the upper limit of normal, and 3) specific computed tomography (CT) findings (but may also include trans abdominal ultrasonographic or magnetic resonance findings).[4,5] Contrast enhanced Computed Tomography (CT) is the imaging method of choice. It is highly accurate and sensitive than USG in diagnosing pancreatitis, describing extent of pancreatic necrosis, and local and/or extra pancreatic complications.[4] Early assessment of the cause and severity of acute pancreatitis is crucial for prompt treatment and management. In 2012, revised Atlanta classification described "severity" of Acute Pancreatitis as mild, moderately severe, and severe using modified CT severity index (MCTSI). Moderately severe pancreatitis has transient local or systemic complications or transient organ failure. Severe pancreatitis has complications with persistent organ failure beyond 48 hours.[5]

This research was undertaken to study the clinical profile and outcomes of acute pancreatitis patients presenting to Manipal Teaching Hospital at Pokhara, Gandaki Province, Nepal.

METHODS

This descriptive, cross sectional hospital based study was carried out in the unit of Medical Gastroenterology under Medicine department at Manipal College of Medical Sciences and

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Teaching Hospital, Nepal from January 2019 to June 2020 for a duration of 18 months. All consecutive patients above 18 years of age admitted under Unit of Gastroenterology, Department of Medicine at Manipal Teaching Hospital at Pokhara, Gandaki province, Nepal with the diagnosis of acute pancreatitis (2 of the 3 criteria- abdominal pain , serum amylase or lipase activity >3 Upper normal limit , characteristic radiological findings) were included in this study. Patients with chronic pancreatitis, pancreatic malignancy, those with incomplete records and those who failed to give consent were excluded from the study.

History, physical examination and data considering demographic variables, clinical features, complications, laboratory and radiological findings were studied. Complete hemogram, liver function tests, renal function tests, serum amylase, serum lipase, random blood sugar, lipid profile, serum calcium, LDH , C-Reactive protein and arterial blood gas analysis were done for all the patients. Ultrasound of the abdomen was done at emergency at the time of presentation and repeated within next 48 hours. Contrast Enhanced Computed Tomography (CECT) abdomen was done after 3-5 days of admission and modified CT severity index was calculated.

Patients were classified into mild, moderately severe and severe acute pancreatitis based on revised Atlanta classification (RAC) and modified CT severity index (CTSI). Patients were managed as per the standard guidelines. Patients with moderately severe and severe pancreatitis were managed in Intensive Care Unit. Patients with mild pancreatitis were managed in the ward.

Data were collected covering the relevant parameters for the study. All categorical data were expressed in percent and absolute number. All numerical continuous data were expressed in mean ±SD. Statistical analysis was done with student's t test for continuous variables . Chi squared test or Fisher's exact test (wherever Chi squared test was not feasible) were used to test for significant difference of proportions for categorical data. All tests were analyzed with a 95% confidence interval and a p value of <0.05 was considered statistically significant. The data analysis was done using Statistical Packages for the Social Sciences (SPSS) 20. Informed consent was obtained from the patient/patient's relative. Approval of the study, its verification and ethical clearance was obtained from institutional review committee (MEMG/IRC/327-329/GA).

RESULTS

A total of 74 patients were admitted between January 2019 and June 2020. However, eight patients were taken away to home or elsewhere by patient relatives against medical advice despite initial management and few days of admission and further four were excluded because of inadequate data. Finally, total 62 patients, comprising of 43 (69.4%) males and 19 (30.6%) females were taken up for the study (M:F=2.3:1). All 3 diagnostic features comprising of pain abdomen, raised enzymes and CECT findings suggestive of Pancreatitis were present in 39 (62.1%) patients.

The mean age of subjects was 44±10.87 years with a range of 21 – 68 years of age. Patients were further classified as per sex and age groups with maximum cases (n=31, 50 %) in 41-60 years of age group (Table 1). The study group comprised of 21 (33.9%) farmers followed by 18 (29%) retired personnel, 13 (20.9) government job holders and 10 (16.2%) housewives.

The commonest etiology of pancreatitis was alcohol induced and seen in 33 (53.2%) patients followed by biliary pancreatitis in 23 (37.1%) cases. Pancreatitis due to hypertryglyceridemia was seen in 2(3.2%). In rest 4 (6.4%) cases, etiology was unknown. Thirty six (58.1%) patients were documented chronic smokers. Thirty three (53.2%) had some form of pre existing co-morbidities. Hypertension, Diabetes Mellitus and coronary artery diseases were the most common co-morbidities.

Table 1. Age groups/sex distribution of patients. (n=62)

Sex	21-40 years	41-60 years	> 61 years	Total
Male	18	21	4	43
Female	7	10	2	19

The most common presentation was abdominal pain and seen in all 62 (100%) followed by nausea in 52(83.9%), vomiting in 41(66.1%), abdominal tenderness in 38(61.3%) and fever in 13(21%). Pain radiating to back was present in 19(30.6%) patients. History of jaundice was present in 7 (11.3%) patients.

Serum amylase and serum lipase were raised in 60 (96.8%). Serum amylase was raised more than 3 times in 54(87.1%) patients. Significant rise in serum lipase (more than 3 times) was seen in 48 (77.4%). Serum AST, LDH and CRP were raised in 56 (90.3%), 43(69.3%) and 36(58.1%) patients respectively. Low serum calcium (<8mEq/L) was seen in six (9.6%) cases. Blood urea and serum creatinine were raised in 12 (19.4%) cases. Leucocytosis of > 12,000/cmm^3 was seen in 42 (67.8%) patients.

Pleural effusion was evident in 9 (17.3%) patients in Chest X-ray. Tran abdominal USG at emergency showed features probable of pancreatitis in only 16 (25.8%) patients. The sensitivity of USG in detect-

ing Pancreatitis rose to 38.7% (n=24) after 3 days of admission. Contrast Enhanced Computed Tomography (usually done after 72 hours) of abdomen revealed features of pancreatitis in 45 (72.6%) patients. Necrotizing pancreatitis was seen in 13 (21%) patients. Pancreatic fluid collection was seen in seven (11.3%) patients . Modified CTSI score was 0-2 in 22 (35.5%) patients, 4-6 in 28 (45.1%) patients and 8-10 in 12 (19.4%) patients with acute pancreatitis.

Complications were seen in 17(27.4%) patients. The most common complication was pancreatic necrosis seen in 13(21%) followed by acute kidney injury in 12 (19.4%) , pleural effusion in nine (17.3%) , shock in eight (15.4%) and sepsis in eight (15.4%) . Others complications were as in Table 2.

Table 2. Complications in patients with acute pancreatitis under study. (n=62)

Variables	Patients	Frequency (%)
Pancreatic necrosis	13	21
ACUTE Kidney Injury	12	19.4
Pleural effusion	9	17.3
Shock	8	15.4
Sepsis	8	15.4
Pancreatic fluid collection	7	11.3
MODS	6	9.7
ARDS	5	8.1
Upper GI bleed	4	6.4

MODS: Multi organ dysfunction syndrome, ARDS: Acute respiratory Distress Syndrome.

Among 62 patients, majority (n=45, 72.6%) were mild cases with no complications. Six (9.7%) cases were of moderately severe. Rest 11(17.7%) cases were severe and had complications with persistent organ failure beyond 48 hours. In this study, 44 (71 %) had an uneventful recovery and 18(29%) had complications that required some form of interventions. Among patients with biliary pancreatitis, nine (14.5%) patients had stones in common bile duct, so were referred for Endoscopic retrograde Cholangio Pancreatograpghy (ERCP) for retrieval of stones. Seven (11.3%) cases underwent Cholecystectomy. Two (3.2%) patients on follow up at 6 weeks had persistent and large pseudo cyst. They underwent cystogastrostomy. No patients required any form of surgical interventions for necrotizing pancreatitis or any pancreatitis related complications.

Table 3. Outcome of subjects as per complications.

Variables	Total	Mortality (%)	Discharged (%)	Statistics (p value)
Necrotizing Pancreatitis	12	4(33.3)	8(66.7)	0.02*
ACUTE Kidney Injury	9	4(44.4)	5(55.6)	0.015*
Sepsis	8	4(50)	4(50)	0.012*
Shock	8	4(50)	4(50)	0.012*
MODS	6	4(66.7)	2(33.3)	0.01*
ARDS	5	4(80)	1(20)	<0.001*
Pleural effusion	9	4(44.4)	5(55.6)	0.015*
Upper GI bleed	4	4(100)	0(0)	<0.001*
Co-morbidities	33	4(12.1)	29(87.9)	0.315

*statistically significant at 5% level of significance

Average days of hospital stay were12 days. Fifty eight (93.5%) patients were discharged home after treatment. Four (6.5%) patients had inpatient mortality within 14 days. Out of these 4 patients who died in hospital, 3(75%) patients had severe pancreatitis and 1(25%) patients had moderately severe pancreatitis. The most important complications associated with mortality were necrotizing pancreatitis, acute kidney injury, sepsis , shock , multi organ dysfunction syndrome (MODS) , acute respiratory distress syndrome (ARDS), pleural effusion and upper gastro intestinal (GI) bleed (Table 3). Significant association was observed between these variables and mortality (p=<.005) (Table 3).

The important laboratory parameters and radiological findings associated with mortality were

Table 4. Outcome of subjects as per laboratory parameters and radiological findings.

Variables	Total	Mortality (%)	Discharged (%)	Statistics (p value)
Raised CRP	36	4(11.1)	32(88.9)	0.475
Raised LDH	43	4(9.3)	39(90.7)	0.536
Low Calcium(<8mEq/L)	6	4(66.7)	2(33.3)	0.01*
Raised Amylase > 3 times	54	4(7.4)	50(92.6)	0.72
Raised Lipase > 3 times	48	4(8.3)	44(91.7)	0.64
Leucocytosis (>12,000)	42	4(9.5)	38(90.5)	0.525
Pleural effusion in Chest X-Ray	9	4(44.4)	5(55.6)	0.015*
Modified CTSI score 0-2	22	0(0)	22(100)	0.85
Modified CTSI score 4-6	28	0(0)	28(100)	0.73
Modified CTSI score 8-10	12	4(33.3)	8(66.7)	0.02*

*statistically significant at 5% level of significance

as in Table 4. Significant association was observed between low serum calcium, pleural effusion in Chest radiograph (Chest X-ray), modified CTSI ≥8 and mortality (p=<0.05) (Table 4).

DISCUSSION

The mean age of subjects was 44±10.87 years in the current study with a range of 21 – 68 years of age. The majority of cases were in age groups of 41 -60 years and male predominance was observed in all age groups (M:F=2.3:1). In a previous study in Nepal by Manandhar et al.[6], the mean age of patients was almost similar, 45±10 years with male dominance. The male dominance in both these studies could be because of more alcohol consumption in males compare to females in Nepal. Similar were the ages; 45.68 ± 19.64, 42.89 ±12.53 and 41.5+/-15.0 years in the studies by Reid et al.[7] and Negi et al.[8] and Wig JD et al.[9] respectively and all these studies also showed male dominance. The studies by Negi et al.[8] and Vengadakrishnan et al.[10] have also demonstrated majority of cases in age groups of 41-60 years.

The commonest etiology of pancreatitis was alcohol induced (53.2%) followed by biliary pancreatitis (37.1%). Alcohol (59.34%) was similarly the most common cause of acute pancreatitis followed by gallstone (32.52%) in the study by Negi et al.[8] Similar were the findings in the study by Manadhar et al.[6] and Rao et al.[12] Whereas, Gall stone disease was most common etiological factor seen in 40% cases followed by alcohol in 38% according to Raghuwanshi et al.[11] Biliary tract disease (71.4%) was the most common etiology in the study by Reid et al.[7]

The most common presentation was characteristic abdominal pain (100%) followed by nausea (83.9%), vomiting (66.1%), abdominal tenderness in (61.3%) and fever (2%) in the current study. Pain abdomen (100%) followed by vomiting (42.27%) were the common presentation in the study by Negi et al.[8], findings similar to ours. Similar presentation with characteristic abdominal pain (79%), vomiting (71.4%) and fever (23.8%) was described by Reid et al.[7] Amylase was raised more than 3 times in 87.1% in the current study. It was almost similar (81%) by Reid et al.[7] It was lower, 47 % according to Rao et al.[12] Lipase was raised more than 3 times in 77.4% in the current study. It was similarly raised (82%) according to Rao et al.[12] Azotemia was seen in 19.4% and leucocytosis was seen in 67.8% patients in the current study. Leukocytosis was seen in 60% and azotemia (25%) according to Rao et al.[12], findings almost similar to ours.

USG detected Acute Pancreatitis in 38.7% whereas, CT was diagnostic in 72.6% in the current study. The sensitivity in diagnosing pancreatitis was lower according to Reid et al.[7] Only 21% had evidence of acute pancreatitis on Ultrasonography and 46% by CT according to Reid et al.[7] Majority (72.6%) presented clinically with mild severity in the current study. In our study, 9.7% cases were of moderately severe and rest 17.7% cases were severe. Whereas, disease severity was mild in 61.1%, moderately severe in 26.7%, and severe in 12.2% of patients in the study by Reid et al.[7]

Complications were present in 27.4% patients in the current study. It was even higher, 46 % in an earlier study in Nepal by Manadhar et al.[6] The most common complication in the current study was pancreatic necrosis (21%) followed by acute kidney injury (19.4%) , pleural effusion (17.3%) , shock (15.4%) and sepsis (15.4%) . Pancreatic fluid collection was seen in 11.3% and Multi organ dysfunction syndrome (MODS) in 9.7% in the current study. In the study by Vengadakrishnan et al[10], MODS (18.2%) was the most common complication followed by pleural effusion in 13.6% , pseudo cyst in 8.2%, shock in 1.8% and Acute Respiratory distress Syndrome (ARDS) in 1.8% patients. The incidence of pleural effusion was 21.1% and 18% in the studies by Negi et al.[8] and Rao et al.[12] respectively. Pancreatic necrosis (15%) was the most common local complication according to Reid et al[7]. Multi-organ failure occurred in 19.1% of the patients with organ failure and pleural effusion was the most common extra-pancreatic complication seen in 46% cases in the study by Raghuwanshi et al.[11]

Average hospital stay was 12 days in the current study. The mean duration of hospitalization was 9.5 days, 8.1 days and 7.7days respectively in the studies by Reid et al.[11] , Negi et al.[8] and by Vengadakrishnan et al.[10]

In the current study, 14.5% patients had to undergo ERCP for retrieval of stones in CBD. Seven (11.3%) cases underwent Cholecystectomy. In an earlier study in Nepal by Manadhar et al.,[6] 11% underwent cholecystectomy after acute bilary pancreatitis. Cholecystectomy was done in 4.2% and ERCP was performed in 12.1% patients according to Reid et al.[7]

Inpatient mortality was 6.5% in the current study. In the studies by Rao et al.[12] and Vengadakrishnan et al.,[10] the mortality rates were 12.7% and 8.1% respectively. Mortality rates were lower; 5.6% and 2.2% in the studies by Negi et al[8] and Manandhar et al.[6] In the current study, 25% deaths occurred among patients with moderately severe and 75% deaths among severe patients with acute pancreatitis. Similar were the findings in the study by Reid et al.[7] where 71.42% deaths were observed

with severe pancreatitis and 28.57% deaths in moderately severe pancreatitis.

The most important variables associated with mortality were necrotizing pancreatitis, acute kidney injury, sepsis, shock , MODS, ARDS, pleural effusion , upper GI bleed , high modified CTSI and low calcium in the current study. Whereas, high CRP, high LDH, high lipase, MODS and high modified CT severity index were the only indices of increased mortality in the study by Vengadakrishnan et al.[10] However, high values of CRP, LDH, elevated liver enzymes and elevated amylase or lipase did not correlate well with mortality in our study. High amylase and high leukocyte count at admission were similarly not associated with mortality in the study by Vengadakrishnan et al.[10] MODS was described as an important independent factor for mortality according to Wig et al.[9]

CONCLUSIONS

Alcohol and gallstones were the most common etiologies of acute pancreatitis and were common in males, in middle age groups. The most common presentation was abdominal pain. Majority presented with mild severity and few complications. Mortality was observed in patients with persistent complications, organ failure, low serum calcium and high modified CT severity index in patients with severe acute pancreatitis.

Conflict of Interest: None

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