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A clinical study of complications of acute pancreatitis and its management in a tertiary care hospital

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ABSTRACT: Background: The presentation of acute pancreatitis is a pathological broad spectrum ranging from parenchymal edema to severe necrotizing pancreatitis. The complications associated with acute pancreatitis can be local which involves the peri pancreatic tissue, or regional involving adjacent visceras or it can be systemic which may affect any part or system of the body. Early identification and management of complications can help reduce morbidity and mortality in a long way.

Patients and Methods: 40 patients of acute pancreatitis who were found to have complications, in the form of systemic or local, either on admission or during the stay in hospital, were included in the study. Assessment of each patient was done using serum amylase, serum lipase,and imaging modalities like USG and CECT. They were graded according to the presence or absence of Ranson's Prognostic Signs and the CTSI . The grading was taken as a guide for the subsequent management.

Results: The study showed a male preponderance with a mean age of presentation of 38.8 yrs. Alchohol and gall stone disease were the most common etiological factors. Peripancreatic fluid collection was the most common local complication. 6 patients developed pseudocysts. The most common systemic complication was pleural effusion. Most complications were managed conservatively but some required surgical intervention.

Conclusions: Early diagnosis is essential to manage the complication and decrease mortality. Severe cases may present with already developed complications which may either be systemic or local complications whereas some cases may go on to develop complications later on for which careful observation is necessary. The Ranson's severity criteria is found to be useful guide for disease prognosis. However in severe cases CT findings are the most appropriate adjunct in management of patients..

Keywords: acute pancreatitis, pseudocysst, necrotizing pancreatitis

I. INTRODUCTION:

Acute pancreatitis, since long, has been an important cause of morbidity and mortality. It varies from mild self limiting disease to a fulminant process with multi-organ failure and even death. The etiology of acute pancreatitis is related to alcohol or biliary tract stone disease in around 80% of cases. Metabolic factors, drugs and other conditions consist 10% and 10% are idiopathic[1]. The pathogenesis of acute pancreatitis involves the release of prematurely activated digestive enzymes into the pancreas and the blood stream.

The presentation of acute pancreatitis is a pathological broad spectrum ranging from parenchymal edema to severe necrotizing pancreatitis. Severe acute pancreatitis is associated with complications which can be local such as necrosis, abscess or pseudocyst or it can be systemic which may affect any part or system of the body[2].

Diagnosis is clinical and is supported by estimation of serum lipase, serum amylase, trysinogen or isoamylase[3]. CECT is the currently imaging modality of choice[4]. In the management of acute pancreatitis, conservative management has become the gold standard. Recurrence is well known for this condition and most of the complications of acute pancreatitis can be treated conservatively but some of them require surgery.

In this study an attempt has been made to study the age and sex distribution, various etiological factors, clinical features, and complications of acute pancreatitis and evaluate the diagnostic modalities available in this hospital for

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the treatment of acute pancreatitis and its complications.

II. PATIENTS AND METHODS:

This study was undertaken in the Department of General Surgery, Gauhati Medical College & Hospital, Guwahati, Assam for a period of one year from 1st August 2016 to 31st July 2017. Of the total admitted cases of acute pancreatitis, confirmed on the basis of clinical, biochemical and radiological evaluation, 40 patients who were found to have complications, either systemic or local; on admission or during the stay in hospital, were included in the study.

Inclusion criteria:

- All cases of acute abdominal pain with elevated serum amylase and/or lipase.
- All cases of acute abdomen with USG/CT/MRI features suggestive of pancreatitis.

Exclusion criteria:

- USG/CT/MRI scan reports of acute pancreatitis with coexisting conditions like perforated peptic ulcer, intestinal gangrene, intracranial bleed, ectopic pregnancy, carcinoma head of pancreas.
- Patients who are found to be suffering from cardiovascular, respiratory and systemic failure previously (before the onset of disease).

Assessment of each patient was done at admission and the disease course noted in the initial 48 hours. Estimation of serum amylase, serum lipase, liver function tests, serum electrolytes, CRP and blood counts were done.. Imaging modality of choice included USG and CECT. Each of them was graded according to the presence or absence of Ranson's Prognostic Signs. The grading was taken as a guide for the subsequent management as well as used for predicting the outcome.

Treatmen:t-Abstinence from alcohol in alcoholics, nil orally with Ryles tube aspiration, I.V. fluids, broad-spectrum antibiotics, injection Somatostatin or Octreotide ,IV Proton Pump Inhibitors/H2 blockers and analgesics formed the cornerstone of conservative management. Surgical interventions were considered in the following situations

1) Specific complication such as haemorrhage or fistulas,
2) Necrosectomy for fluid collection producing symptoms and/or infection of necrosis, and sterile pancreatic necrosis not responding to conservative treatment,
3) Cystogastrostomy in Pseudocyst,
4) Elective cholecystectomy after pancreatic inflammation subsides.

III. RESULTS AND OBSERVATIONS

In the present study the age of the patients ranges from 14 to 68 years. The mean age was 38.8 yrs. Out of 40 patients, 31(77.5%) were male and 9(22.5%) were female.

Out of the 40 cases, 17 were found to be alcoholic. Out of these 17 patients, 14 were cigarette smokers as well. Total no of smokers among the study population was 18. In present study of 40 patient 35 were non vegetarian. They had habit of taking spicy and fatty meal. Remaining 5 patients were vegetarians. No specific drug history or family history suggestive of any etiological relationship could be elicited in any of the patient. Out of 40 cases of acute pancreatitis three of them had previous history of acute pain abdomen.

Clinical Features:

All 40 cases presented with history of pain abdomen. The onset of pain was sudden with duration varying from 1 to 8 hours. It was localized to upper abdomen in 19 cases, epigastric region with radiation to back in 12 cases and generalized in the remaining 9 cases. Nausea and vomiting occurred in 33 cases. 9 patients out of 40 (22.5%) developed persistent fever with chill and rigor. Jaundice was present in 12 patients (30%) and 11 patients (27.5%) developed oliguria with 7 of them developing ARF.

Investigations:

Biochemical finding: Among the 40 patients, serum lipase was raised in 35 patients, 29 had raised amylase (>3 times the normal) and 21 patients had increased level of C-reactive protein. Serum bilirubin was raised in 12 cases. Serum creatinine was elevated in 8 cases. Sr ALKP was significantly raised in 8 cases. Random blood sugar was raised in 6 cases. Serum calcium was below normal (<8 mg/dl) in 4 patients and they developed severe disease.

Imaging studies: Plain chest X-ray showed pleural effusion in 15 patients of whom 4 had it bilaterally and the rest of them on the left side. Ultrasonography abdomen showed inflammatory pancreatic condition in 27 of the patients, gall bladder calculi in 13 cases and gallstone with CBD stone in 1 patient. 2 patients had choledocholithiasis. 12 patients were found to be

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having free fluid in abdomen. Pseudocyst was found in 6 cases. Parasite (ascariasis) was detected in the common duct in 2 cases in which no other demonstrable cause of pancreatitis could be identified. 2 patients had developed pancreatic abscess. Total 20 patients with severe symptoms were advised for C.T. scan. 9 of these patients were diagnosed to be having Acute Necrotizing Pancreatitis (ANP).

Table 1 –Type of Acute Pancreatitis based on etiology

No(s) of patients	Diagnosis	Percentage
16	Acute Biliary Pancreatitis	40%
17	Acute Alcoholic Pancreatitis	42.5%
5	Acute Idiopathic Pancreatitis	12.5%
2	Acute Pancreatitis due to Ascariasis	5%

All the cases were assessed and Ranson's Criteria was used to grade the severity, determine the prognosis and help to execute treatment.

Table 2: Number of cases per variables of Ranson's Criteria in Gallstone Pancreatitis

I. Gallstone Pancreatitis (n =16)			
At admission		**Initial 48 hrs**	
Variables	**No (s) of cases**	**Variables**	**No (s) of cases**
Age >70yrs	0	Hct fall >10%	4
WBC>18,000mm^3	9	BUN> 2mg /100ml	5
Glucose > 220mg/100ml	2	Calcium <8 mg/100ml	1
		Base deficit >5mEq/L	4
LDH>400IU/L	5	Fluid sequestration> 4L	6
AST>250 IU/L	7		

Table 3- Number of cases per variables of Ranson's Criteria in Non-Gallstone Pancreatitis

II Non-Gallstone Pancreatitis (n =24)			
At admission		**Initial 48 hrs**	
Variables	**No (s) of cases**	**Variables**	**No (s) of cases**
Age > 55 yrs	3	Hct fall >l0%	7
WBC > 16,000/mm^3	21	BUN > 5mg/100ml	6
Glucose > 200mg/100ml	4	Calcium < 8 mg/100ml	3
		Base deficit > 4 mEq/L	4
LDH > 350 IU/L	5	Fluid sequestration > 6L	10
AST > 250 U/dl	3	PaO2 < 60 mm Hg	5

Table 4- Types of Acute Pancreatitis on the basis of severity

Grading	Gallstone Pancreatitis	Non-Gallstone Pancreatitis	Total no(s) of cases	Percentages
Severe (Ranson's score ≥3)	13	21	34	85%
Mild (Ranson's Score< 3)	3	3	6	15%

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Complications: most common local complication was peri-pancreatic fluid collection occurring in 8 patients. 6 patients developed pseudocyst and of these one with UGI bleed and CLD developed ANP, ARDS and MODS and expired in ICU. Nine patients developed acute necrotizing pancreatitis of which 2 patients died before any surgical intervention could be undertaken. The most common systemic complication noted was pleural effusion, seen in 15 patients.

TABLE 5:Etiological distribution of pseudocyst-

Total cases	Alcoholic	Idiopathic	Gallstone
6	4	1	1

TABLE 6: Etiological distribution of necrotising pancreatitis-

Total cases	Alcoholic	Biliary	Idiopathic
9	4	4	1

Management: On admission all the patients who presented with acute pancreatitis and/or its complications were put on conservative treatment. These cases were primarily managed in the ward. 10 cases of severe pancreatitis were subsequently shifted to the ICU of which only 6 survived. Three patients with ARDS were put on assisted ventilation. 5 patients with ARF were put for haemodialysis. Patient suffering from necrotizing pancreatitis were put on antibiotics and on repeated evaluation if found to develop secondary infection, than planned for surgical intervention. In one patient suffering from biliary necrotizing pancreatitis, necrosectomy was performed along with cholecystectomy, but unfortunately the patient developed ARDS and pneumonia and expired in ICU. Among the 6 Patients developing pseudocyst, cystogastrostomy was performed in three of them. 2 patients got well on conservative treatment. One patient with associated CLD and varices presenting with shock developed ANP, ARDS and MODS and died in ICU. The two patients with pancreatic abscess were treated with pigtail drainage under USG guidance. Cholecystectomy for biliary pancreatitis in the same hospital admission (2 weeks-4weeks after admission) was done in 4 cases. In two patients with CBD stone and cholangitis choledocholithotomy and T-tube drainage was done.

Duration of hospital stay: Patients with ANP and post operative cases required prolonged hospitalisation. Median hospital stay was 10.8 days.

Mortality: A total of 6 patients died in this study. Three of them had ANP. Out of the seven patients with ARF, five underwent dialysis and two of them expired. One patient died 10 days after cystogastrostomy due to UGI bleeding.

Follow up:

Patient treated conservatively were regularly followed up for 6 months. Two patients could not be followed up as they did not turn up.

IV. DISCUSSION

These patients presented with acute pancreatitis and/or its complications and an attempt was made to evaluate these patients in relation to their mode of presentation, etiology course of the disease with special reference to development of complications and their investigation and management in the context of available resources.

Age: The age of the patients in the present study ranged from 14yrs to 68 yrs with mean age of 38.8 years. Garg et al. 2001[5] and Surati et al.2014[6] recorded mean age of 41.3 yrs and 40.3 yrs in their studies.

Sex: The sex distribution of patients depends upon etiological factor but in a small group of patients like us this pattern may not be maintained. We found a male to female ratio of 3.44:1. Garg et al. 2001[5] , Surati et al. 2014[6] and Hussain et al. 2015[7] recorded male : female ratios of2.1:1, 2.33: 1and 1.21:1 respectively.

Addiction: In our study, 42.5% of patients had history of alcohol intake. This is comparable to the findings of Surati et al. 2014[6](56%). In our study we found 18 patients (40%) with history of chronic smoking.

Clinical features: Most of the patients suffering from acute pancreatitis had pain abdomen as main clinical presentation. Surati et al; 2014[6] and Hussain et al 2015[7] recorded pain abdomen in 100% and 97.12% of the patients. We also found that a majority of the patients (60%) presented in the first 12 hours of the onset of pain. 20 % presented within 12 to 24 hours and 20% after 24 hours.

In our study, 33 (82.5%) cases presented with history of nausea and vomiting and it is comparable to other studies like Surati et al. 2014[6](86%) and

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Hussain et al 2015[7] (71.15%). In present series Jaundice was present in 12 patients (30%) in total, out of which 6 were acute biliary pancreatitis. As cited by Paul Yakshe, 2005[8], a minority of patients i.e. 28% of total in his literature exhibit jaundice and our findings tally with him. . We found abdominal tenderness in 30 patients (75%) at time of admission. In their studies, Paul Yakshe 2005[8], and Husssain et al 2015[7] found that abdominal tenderness was present in 68% and 97.12% of the study population respectively. Hussain et al. 2015[7], in their study found 10.58% patients presenting with shock and our study (10%) matches with them.

Laboratory investigations:

35 patients (87.5%) in our study had raised serum lipase levels and 29 patients (72.5%) had 3 fold rise of serum amylase. Surati et al. 2014[6], in their study found raised lipase level in all the 50 patients (100%) and more than threefold increase in serum amylase in 44 patients (88%). The CRP value at 48hr. >l50 mg/dl was found in 52.5% of cases and was comparable with other studies like Flint et al.2003[9] (67%).

Chest x-ray: In our study**,** CXR showed pleral effusion in 37.5% cases, with bilateral involvement in 10%. Hussain et at 2015[7] found pleural effusion in 33.65%, with bilateral involvement in 12.5%

Ultrasonography of abdomen: In their study, Surati et al. 2014[6] found 60% of 50 patients to be having pancreatic edema. Overall 13 patients (26%) had biliary etiology. In our study we performed USG in all patients and it showed gall stones in 13 patients, gall stone with common bile duct stone in 1 patient and 2 patients with CBD stone only. Two patients were diagnosed to have ascariasis in the bile duct. Incidence of biliary pancreatitis in various studies like Garg et al. 2001[5](49.11%) and Flint et al. 2003[9] (42%) tallies with our study (40%). obstruction of the common bile duct by stones (38%) and alcohol abuse (36%) are the most frequent causes of acute pancreatitis, as stated by Wang et al. 2009[10].

CT Abdomen: 20 patients were subjected to CECT and it picked up acute necrosis in 9 cases (22.5%). The other findings of USG like pseudocyst, acute fluid collection etc. could be better appreciated in CT. Grading was done according to CT severity index (CTSI). 3 patients had moderate CTSI and 6 cases had severe CTSI. The usefulness of CT in the diagnosis and management of acute pancreatitis is well established and confirmed by the results of study by Chin et al. 2014[11], in which the CT diagnosis correlated with the final diagnosis in 87.5% cases..

Depending on biochemical study and radiological correlation the etiological diagnosis we got is tabulated below and compared to various studies.

Table 7- Etiological diagnosis in different studies (in percentage).

Series (no of cases)	Alcoholic	Biliary	Post ERCP	Drug Induced	Cong. Anomaly	Metabolic	Idiopathic	Post operative	Pregnancy	Traumatic	Ascariasis
Garg PK et al. 2001 (169)	49	23.6	5.9	1.18	---	1.1	16.5	---	---	1.1	0.5
Yakshe P et al. 2005 (NA)	35	38	1	1.4	1	2	10	1	---	---	---

Surati et al. 2014 (50)	56	26	---	---	---	---	10	---	---	---	---
Hussain et al. 2015 (104)	23.08	51.92	0.96	0.96	---	---	14.42	3.85	1.92	0.96	---
Present series	42.5	40	---	---	---	---	12.5	---	---	---	5

COMPLICATIONS: We compared different complications in our 40 cases with acute pancreatitis with other studies as given below:

Study	Total patients	Respi ratory	Circula tory	Renal	MODS/sepsis	GI bleed
Flint et al. 2003	112	88%	71%	48%	----	22%
Beger et al. 2005	114	24.5%	----	29.8%	19%	10%
Hussain et al. 2015	104	33.65%	10.57%	7.69%	---	1.92%
Present Study	40	37.5%	10%	17.5%	5%`	2.5%

TABLE 8: COMPARISION OF SYSTEMIC COMPLICATIONS.

Table 9: Comparison of local complications

Study	Pancreatic necrosis	Pseuocyst	Fluid collection/ ascites	Abscess
Flint et al.2003	54%	17%	30%	26%
Surati et al. 2014	---	11.9%	23%	---
Hussain et al. 2015	27.88%	7.69%	31.37%	1.92%
Present series	22.5%	15%	25%	5%

Treatment: in our study the patients were initially treated in wards and only 10 patients (25%) were subsequently shifted to ICU. We administered prophylactic antibiotics routinely in patients. Sharma et al. 200l[14] reported a reduction in mortality with prophylactic antibiotics compared with placebo in patients with severe acute pancreatitis. Surgery was performed in total 11 cases (27.5%) in our study which were done in both urgent and semi-urgent basis. We performed necrosectomy in two patients with biliary necrotizing pancreatitis. Buchler and Reber 1999[15], Yousaf et al. 2003[16] all recommend that currently only infected peripancreatic necrosis is a generally accepted indication for operation.Cholecystectomy was done along with necrosectomy in the same setting. Cystogastrostomy was done in 3 out of 6 cases of pseudocyst in our study, Imrie et al.1986[13] advocate internal drainage, commonly cystogastrostomy in their experience of 88 cases of pseudocyst over l2 years. The two cases of

pancreatic abscess were treated by pigtail catheter drainage under USG guidance.

Duration of hospital stay: The patients who required prolonged hospitalization were those with ANP and the post operative eases. The median hospital stay in our study is 10.8 days. Surati et al. 2014[5], in their study of 50 patients mentioned average hospital stay of 7 days.

Mortality: A total of 6 patients (15%) died in this study. Three of them had ANP. Out of the seven patients with ARF, five underwent dialysis and two of them expired. One patient died 10 days after cystogastrostomy due to UGI bleeding. Hussain et al. 2015[7], in their study of 104 patients found mortality of 13.46 %.

V. CONCLUSSION

Acute pancreatitis with complications is one of the most common and catastrophic acute abdominal conditions. It is primarily a disease of middle aged adult working population of which alcoholism and gallstone are the principal causes. In our area of developing country ectopic migration of worms is another cause worth mentioning. Alcoholic pancreatitis is rare in the first three decades of life, apparently because it takes many years of sustained heavy drinking to induce acute pancreatitis.

A good clinical history, meticulous clinical examination, raised levels of serum amylase and/or lipase, ultrasonography and CECT of abdomen provides diagnostic confirmation.Early diagnosis is essential to manage the complication and decrease mortality. Severe cases may present with already developed complications which may either be systemic or local complications whereas some cases may go on to develop complications later on for which careful observation is necessary. The Ranson's severity criteria is found to be useful guide for disease prognosis. However in severe cases CT findings are the most appropriate adjunct in management of patients.

The standard therapeutic policy of initial resuscitation and conservative approach resulted in a satisfactory outcome in patients but in severe cases ICU care and monitoring is required. Judicious surgical intervention benefits patients with complications in the form of necrosis, pseudocyst, abscess or biliary pancreatitis with cholangitis not responding to conservative therapy. The conservative approach of elective cholecystectomy after subsidence of pancreatic inflammation provides acceptable results.

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