Observation on Uncommon Complications of Acute Pancreatitis

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ABSTRACT

BACKGROUND

Acute pancreatitis is a sudden inflammation of pancreas that lasts for a short time. It may range from mild discomfort to a severe, life threatening illness. Abdominal pain which is the major symptom of acute pancreatitis may be accompanied by nausea, vomiting and abdominal distension.¹ There may be low grade fever with features of shock which is not unusual.² Most people with acute pancreatitis recover completely after getting the right treatment. About 80% of cases of acute attack are self-limited and recover spontaneously within a week after the treatment. But in severe cases, acute pancreatitis can result in bleeding into the gland, serious tissue damage, infection and cyst formation. Severe pancreatitis can also harm other vital organs such as heart, lungs and kidneys. Transient hypotension, transient myocardial ischemia reflected by ST-T changes in ECG and associated with diastolic dysfunction and ARDS are uncommon complications of acute pancreatitis. This study was conducted to evaluate their incidence and prognostic significance in acute pancreatitis.

METHODS

This study was conducted in Patna Medical College Hospital, Patna, on admitted cases during the period august 2018 – august 2019. A total of 30 cases were included in this study who were diagnosed as acute pancreatitis and gave written consent for the same. Patients with association or history of stroke, head injury, CNS infection, features of demyelination, acute coronary syndrome, cardiogenic pulmonary oedema and established liver disease were excluded.

RESULTS

The incidence of transient hypotension, transient myocardial ischemia and ARDS in this study was found to be 13.3%, 6.6% and 6.6% respectively and they were all associated with high mortality.

CONCLUSIONS

The commonest risk factor of acute pancreatitis was seen to be Gall Stone followed by Alcoholism, hyperlipidaemia and smoking in this study also. The overall mortality (13.3%) in this study was slightly lower than other studies. and this may be due to small sample size and variation of mortality with time of admission. Transient hypotension, transient myocardial ischemia reflected by ST-T changes in ECG, associated with diastolic dysfunction and ARDS were observed as uncommon complications of acute pancreatitis. Their incidence in this study were 13.3%, 6.6% and 6.6% respectively and they were all associated with high mortality. The clinical significance of their early detection is that the early mortality can be reduced with intensive medical and surgical management.

KEY WORDS

ARDS (Acute Respiratory Distress Syndrome), Transient Myocardial Ischemia, Transient Hypotension.

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BACKGROUND

Acute pancreatitis is a sudden inflammation that lasts for a short time. It may range from mild discomfort to a severe, life threatening illness. Abdominal pain which is the major symptom of acute pancreatitis may be accompanied by nausea, vomiting and abdominal distension. There may be low grade fever with features of shock which is not unusual.² Most people with acute pancreatitis recover completely after getting the right treatment. About 80% of cases of acute attack are self-limited and recover spontaneously within a week after the treatment. But in severe cases, acute pancreatitis can result in bleeding into the gland, serious tissue damage, infection and cyst formation. Severe pancreatitis can also harm other vital organs such as heart, lungs and kidneys.

Acute pancreatitis is a common disease with high mortality.³ Two most important risk factors are Gall stones and Alcohol ingestion. Other common causes can be hypertriglyceridemia and cigarette smoking. The risk of acute attack in patients is more even if there is one gall stone. Alcohol induced acute pancreatitis is more common in middle aged men. Pancreatitis evolves in three phases. Initial phase: where intrapancreatic digestive enzyme activation and acinar cell injury takes place. Second phase which involves activation, chemoattraction and sequestration of leucocytes and macrophages in the pancreas resulting in an enhanced intrapancreatic inflammatory reaction. The third phase is due to the effects of activated proteolytic enzymes and cytokines released by inflamed pancreas on distant organs.

Diagnosis is established by any two of the following criteria

1. Typical abdominal pain in the epigastrium which may be radiating to back.
2. Increase in threefold or more in serum lipase or amylase.
3. Cross sectional abdominal imaging which may have confirmatory findings.²

The two diagnostic biochemical markers elevated are the serum lipase and amylase. Amylase rises within hours and remains elevated for three to five days. Lipase is more specific but may be found elevated in other conditions also. But serum lipase is more preferred than amylase. However, there is no correlation between the severity of pancreatitis and the degree of serum lipase and amylase. Laboratory abnormalities encountered include hyperglycaemia, hypocalcaemia, leucocytosis, haemoconcentration, azotaemia, hypertriglyceridemia and mild elevations of liver function test results.

Management

Patient is kept NPO and given intravenous narcotic analgesics for pain and supplemental oxygen. Aggressive fluid resuscitation which is the most important intervention for acute attack is administered in the form of lactated Ringer's solution or normal saline. Initially bolus at 15-20 ml/kg followed by 2-3 ml/kg/hour to maintain urine output >0.5 ml/kg/hour. Serial bedside evaluations done every 6-8 hours to assess vitals, oxygen saturation and change in physical examination to optimise fluid resuscitation. Measurement of haematocrit and BUN every 8-12 hours is recommended to ensure adequacy and response of fluid therapy. A decrease in

haematocrit and BUN during first 12-24 hours is strong evidence for sufficient fluids. If it increases a volume challenge is done with 2L crystalloid followed by increasing fluid rate by 1.5 ml/kg/hour. If it fails, ICU transfer is recommended for hemodynamic monitoring.

There is currently no role for prophylactic antibiotics for necrotising pancreatitis. Sterile necrosis is mostly managed conservatively but once diagnosis of infected necrosis is established pancreatic debridement should be considered. Symptomatic pseudocyst should be drained with surgery or endoscopy or by percutaneous route. For Pancreatic duct disruption after confirmation on MRCP or ERCP, a bridging pancreatic stent is placed for at least 6 weeks. Gallstone pancreatitis detected should be considered for cholecystectomy or endoscopic biliary sphincterotomy during admission or within 4-6 weeks of discharge. Patients with hypertriglyceridemia initial therapy include insulin, heparin or plasma pheresis. Alcoholic pancreatitis is also managed conservatively with abstinence from it on discharge. For outpatient, control of diabetes, lipid lowering agents and weight loss is advised. Nutritional therapy includes a low-fat solid diet for mild acute pancreatitis after abdominal pain has resolved. Enteral nutrition should be considered 2-3 days after admission for more severe pancreatitis instead of total parenteral nutrition. Enteral feeding maintains gut barrier integrity limits bacterial translocation and is less expensive with fewer complications than TPN.² The mortality and morbidity associated with acute pancreatitis are the main concerns for a clinician. This disease is notable for complications leading to mortality and morbidity. Mild disease may resolve without serious complications in 80% cases⁴ but remaining 20% cases with complication have mortality as high as 98%. Hammel, et al,⁵ categorised the disease into three-

1. Severe acute pancreatitis (with high mortality and morbidity). It is characterised by persistent organ failure which may be single or multiple for more than 48 hours.
2. Moderate acute pancreatitis (with high morbidity and low mortality). It is characterised by transient organ failure that may resolve within 48 hours.
3. Mild acute pancreatitis (with low morbidity and no mortality).⁶ There is no local complications or organ failure.

Common Complications of Acute Pancreatitis

1. Systemic- Inflammatory Response Syndrome (SIRS), Hypoxia, Hyperglycaemia, Hypocalcaemia, Hypoalbuminemia
2. Pancreatic- Necrosis of pancreatic cells, pancreatic abscess, Pseudocyst, Pancreatic Cysts, and Pleural effusion.
3. Gastrointestinal- Gastric or duodenal bleed, Variceal bleed, Erosion into colon, Duodenal obstruction (compression by pancreatic mass) and Obstructive Jaundice (CBD compression by swollen pancreas)

There are certain uncommon complications which are being reported recently and those are transient hypotension, ARDS and transient myocardial ischemia. In this study we have devoted ourselves to make an observation on these uncommon complications and their prognostic significance.

METHODS

This is an observational study. Patients from in-patient male and female wards of Patna Medical College Hospital, Patna, admitted during August 2018– August 2019 were included in the study. A total of 30 cases were included in this study who were diagnosed as acute pancreatitis and gave written consent for the same. Patients with association or history of stroke, head injury, CNS infection, features of demyelination, acute coronary syndrome, cardiogenic pulmonary oedema and established liver disease were excluded.

Diagnosis

Diagnosis was made with the help of detailed history and clinical examination, routine investigations including Complete blood count, Routine examination of urine, Random blood sugar, Renal function test, Liver function test, Lipid profile along with special investigations including serum Amylase, Lipase, Lactate dehydrogenase, total and ionised calcium, USG of whole abdomen, CECT abdomen, Chest x-ray, Arterial blood gas analysis, ECG and echocardiography. Certain investigations like Culture of blood or Urine, Ascitic/pleural fluid study and CT brain were done as and when required

Management

Cases were managed using standard regimens and were continuously monitored till discharge, severity of disease was decided using Ranson's and Glasgow's scores. All cases were managed in in-patient department except two out of four who developed ARDS and needed ICU. Other cases with common complications (pancreatic cyst and pseudocyst) were also managed conservatively.

RESULTS

Total 30 cases were included in this study. Table 1 shows age and sex wise incident. We found that acute pancreatitis was found more common in males (63.3%) than females (36.7%) with male female ratio of 1.72:1

Age Groups	Male		Female	
	No. of Patients	%	No. of Patients	%
20 - 30	04	13.3	03	10.0
31 - 40	05	16.7	02	6.7
41 - 50	09	30.0	05	16.7
51 - 60	01	3.3	01	3.3
Total	19	63.3	11	36.7

Table 1. Age and Sex Distribution (n = 30)

Comorbidities	No. of Patients	Percentage
Gall stone	22	73.3
Alcoholism	15	50.0
Hyperlipidaemia	12	40.0
Cigarette smoking	09	30.0
Idiopathic	04	13.3

Table 2. Risk Factors

	No. of Patients	Percentage
Atelectasis	1	3.3
Pleural effusion	4	13.3
Pneumonia	2	6.7
Bilateral lung opacity	2	6.7
Normal	23	76.6

Table 3. Chest X-Ray Findings of Acute Pancreatitis Patients

Table 3 X- ray shows Atelectasis, Pneumonia, Pleural effusion and bilateral opacity. Our concerns are cases showing bilateral opacities because these are the cases with ARDS.

USG Finding of Acute Pancreatitis Patients		
	No. of Patients	%
Interstitial oedematous pancreatitis	2	6.7
Pancreatic necrosis	4	13.3
Pancreatic pseudocyst	4	13.3
Increased pancreas volume	20	66.7
CT Findings of Acute Pancreatitis		
Focal and diffuse enlargement of the pancreas	3	10.0
Pancreatic changes & peripancreatic inflammation	21	70
Acute pancreatic fluid collection	2	6.7
Pancreatic necrosis	4	13.3
ECG Findings of Acute Pancreatitis Patients		
ST segment depression	1	3.3
Diffuse T wave inversion	1	3.3
Normal	28	93.3

Table 4. USG Findings, CT Findings and ECG Findings of Acute Pancreatitis Patients

Table 4. USG is a chief tool for the diagnosis of Acute pancreatitis and also Pancreatic necrosis which was found in four cases who couldn't be saved. CT abdomen was also done in all cases and this table shows different CT findings In ECG findings two cases showed ST-T changes and one of them died

Systolic	< 90 mmHg		100 – 120 mmHg		120 – 140 mmHg		> 140 mmHg	
	No	%	No	%	No	%	No	%
	4	13.3	2	6.7	20	66.7	4	13.3
Diastolic	< 50 mmHg		60 – 70 mmHg		70 – 80 mmHg		> 80 mmHg	
	No	%	No	%	No	%	No	%
	4	13.3	2	6.7	20	66.7	4	13.3

Table 5. Systolic and Diastolic BP Measurement of Acute Pancreatitis Patients

There are two types of hypotension in Acute Pancreatitis- Transient and Persistent, Four cases in this table had transient hypotension and two of them died.

Parameters	No. of Cases	Discharge	Death
Acute pancreatitis with hypotension	04	02	02
Acute pancreatitis with ARDS	02	01	01
Acute pancreatitis with myocardial dysfunction	02	01	01
Acute pancreatitis	22	22	00

Table 6. Clinical Profile and Outcome

DISCUSSION

In this prospective, non- randomised, uncontrolled observational study conducted in Patna Medical College Hospital Patna during August 2018 - August 2019, the overall early mortality was found to be 13.3% and it is slightly lower. This may be due to small sample size and variation in mortality with time of admission.⁷ All four cases who died were having pancreatic necrosis where surgical debridement is required, and this facility is not available in this institution. In this study four cases (13.3%) show transient hypotension and four cases showed elevated blood pressure. Thandassery R B, et al⁶ reported transient hypotension in 19% cases and these cases were found to be associated with diastolic dysfunction. Again, small sample size may be the cause of slightly lower percentage of transient hypotension in this study but the mortality in this group was seen to be similar (50%).

ST-T changes with diastolic dysfunction was seen in 6.6% cases. Pezilli, et al⁸ has reported ST-T changes in 51.8% cases. Here this study differs but figures of mortality (50%) is similar to Pezilli study. Incidence of ARDS was found in 6.6% cases and

mortality in this group also was 50%⁹. Important facts the study reveals is that transient hypotension (13.3%), transient myocardial ischemia (6.6%) with ST-T changes and diastolic dysfunction and ARDS (6.6%) are relatively uncommon complications of acute pancreatitis but they are associated with high early mortality¹⁰. Their early detection warrants intensive therapy and management including surgical debridement to reduce early mortality¹¹. This is the important clinical significance of early detection of these uncommon complications. The basic pathology in all four cases who died was pancreatic necrosis¹².

CONCLUSIONS

The commonest risk factor of acute pancreatitis was seen to be Gall Stone followed by Alcoholism, hyperlipidaemia and smoking in this study also. The overall mortality (13.3%) in this study was slightly lower than other studies. and this may be due to small sample size and variation of mortality with time of admission. Transient hypotension, transient myocardial ischemia reflected by ST-T changes in ECG, associated with diastolic dysfunction and ARDS were observed as uncommon complications of acute pancreatitis. Their incidence in this study were 13.3%, 6.6% and 6.6% respectively and they were all associated with high mortality. The clinical significance of their early detection is that the early mortality can be reduced with intensive medical and surgical management.

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