

Original research article

A prospective observational hospital-based research to evaluate acute biliary pancreatitis

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Abstract

Aim: The aim of the present study to evaluate the acute biliary pancreatitis.

Methods: This was a prospective observational study conducted in the Department of General Surgery, , Anugrah Narayan Magadh Medical College & Hospital, Gaya Bihar, India for 1 year. Total 120 patients with biliary pancreatitis, fulfilling the diagnostic criteria and giving consent to be included in this study. Laboratory investigations including a complete blood count, serum amylase or lipase, renal profile, lipid profile, liver function test and serum electrolytes were done and data recorded. Further radiological evaluation was done with contrast enhanced CT and/or magnetic resonance cholangiopancreatography (MRCP).

Results: The mean age of patients with biliary pancreatitis was 52.75 years. Majority of them belonged to age group of 50-60 years. The most common signs and symptoms were pain abdomen (97.5%) and abdominal tenderness (97.5%) followed by nausea (64.17%), vomiting (57.5%), fever (25%), jaundice (45.83%), Pain radiating back(10.83%), Tachycardia (5.83%). Serum amylase and lipase elevation was diagnostic for pancreatitis and was noted in all the cases. Haematocrit values were raised (>44%) in 30% cases with mean±SD value of 41.97±6.87. Creatinine values were increased (>1.5 mg%) 33 % cases with mean±SD value of 1.42±1.13. Modified CT severity index was applied to all cases which categorised them into mild 21%, moderate 67% and severe category 12%. 46.67% cases were diagnosed with pleural effusion, 44.17% cases had ascites, 22.5% had hepatomegaly and 22.5% were diagnosed to have splenomegaly.

Conclusion: Relevant clinical history, ultrasonography and computed tomography scan of pancreas are helpful in diagnosis of pancreatitis. The computed tomography scan was a better imaging modality as compared to ultrasonography.

Keywords: Pancreatitis, Biliary pancreatitis, ERCP, Early cholecystectomy, CT severity index

Introduction

Pancreatitis defined as the inflammation of the pancreas and is always, associated with acinar cell injury. Acute pancreatitis is clinically characterized by acute onset of abdominal pain and a rise in the activity of pancreatic enzymes in the blood and urine.¹ In India alcohol is the most common cause for pancreatitis followed by gall stones. Acute biliary pancreatitis (ABP) is a complication of gallstone disease with a variable course from mild to one with significant morbidity and mortality. Cholecystectomy in cases of ABP is known to prevent

complications and recurrence. A high rate of recurrence is reported for patients who do not undergo cholecystectomy.²

A debatable topic however is the timing of the cholecystectomy. While interval cholecystectomy was recommended in the past a shifting trend towards early cholecystectomy is being seen. The indications and timing of endoscopic retrograde cholangio-pancreaticography (ERCP) have also been debated.³

Various aetiological factors have been known to cause pancreatitis which include: gall stones, structural lesions like Stenosis or spasm of sphincter of oddi, pancreas divisum, traumatic, microlithiasis, toxins, alcohol, drugs, (frusemide tetracycline), infection (mumps, Coxsackie B-virus, viral hepatitis, HIV, salmonella, shigella, ascariasis lumbricoides), Metabolic (hyperlipidemia, hypercalcemia), vascular (atherosclerosis, vasculitis, SLE, Wegener's disease. Behcet's disease) iatrogenic (ERCP, endoscopic sphincterotomy, coronary artery bypass) cystic fibrosis etc.⁴ Various studies have been undertaken in India and abroad about pancreatitis, its presentation and role of various laboratory and imaging techniques for diagnosis and prognostication.

Material and methods

This was a prospective observational study conducted in the Department of General Surgery, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar India for 1 year. We have conducted a study on 120 cases of pancreatitis patients admitted with biliary pancreatitis during this time were observed during their course of hospital stay. Institutional ethical approval was obtained before conducting this study.

Methodology

Diagnostic criteria for biliary pancreatitis were presence of at least two of the following. Acute abdominal pain and tenderness suggestive of pancreatitis. Serum amylase/lipase ≥ 3 times the normal (>160 U/l). Imaging findings suggestive of biliary pancreatitis i.e. calculi or sludge in the gall bladder or biliary tree.

Total 120 patients with biliary pancreatitis, fulfilling the diagnostic criteria and giving consent to were include in this study.

Patients with history of alcohol intake, suffering from alcoholic pancreatitis and chronic pancreatitis and pancreatic malignancy were excluded from the study.

Procedure

Universal sampling was done, where all patients satisfying inclusion criteria were studied. A total of 120 patients were followed up in this study. A written informed consent was taken from all the patients. All the variables were collected in a pretested standard proforma. Patient demographic details, signs and symptoms along with detailed history was recorded. Laboratory investigations including a complete blood count, serum amylase or lipase, renal profile, lipid profile, liver function test and serum electrolytes were done and data recorded. Further radiological evaluation was done with contrast enhanced CT and/or magnetic resonance cholangiopancreatography (MRCP).

Results

Out of 407, 120 cases were those of biliary pancreatitis. The remaining 287 cases of pancreatitis were due to other aetiologies. The most common cause of pancreatitis was alcohol induced.

Table 1: Age distribution

Age in years	Number of patients	Percentage of cases
below 40	23	19.17
40 to 50	13	10.83
50 to 60	32	26.67
60 to 70	22	18.33
Above 70	30	25

The mean age of patients with biliary pancreatitis was 52.75 years. Majority of them (25%) belonged to age group of 50-60 years and above 70 years with 25% and 80.83 % cases were aged above 40 years as shown in Table.1.

Table 2: Gender base distribution

Gender	N=120	%
Male	72	60
Female	48	40

Of the 120 cases, 72 (60%) were male patients, and 48(40%) were female ,with a female-to-male ratio of 1:1.5. table 2.The most common signs and symptoms were pain abdomen (97.5%) and abdominal tenderness (97.5%) followed by nausea (64.17%), vomiting (57.5%), fever (25%), jaundice (45.83%), Pain radiating back(10.83%), Tachycardia (5.83%) as shown in table 3. Acute kidney injury was seen in 30% of cases.

Table 3: Clinical presentation and incidence

Symptom/sign	Acute pancreatitis	
	Total	%
abdominal pain	117	97.5
Nausea	77	64.17
vomiting	69	57.5
jaundice	55	45.83
Pain radiating back	13	10.83
Abdominal tenderness	117	97.5
Trauma	1	0.083
Fever	30	25
Tachycardia	7	5.83
Hypotension	3	2.5

Serum amylase and lipase elevation was diagnostic for pancreatitis and was noted in all the cases. Haematocrit values were raised (>44%) in 30% cases with mean±SD value of 41.97±6.87. Creatinine values were increased (>1.5 mg%) 33 % cases with mean±SD value of 1.42±1.13. Initial radiological evaluation was done with ultrasonography in all cases. In cases of biliary pancreatitis ultrasonography was able to diagnose gall stones or sludge along with dilatation of the biliary system in some cases. 7 cases had associated choledocholithiasis with dilatation of common bile duct and intrahepatic biliary radical dilatation.

Table 4: Classification of severity based on CT severity index

CT severity index	Percentage of cases
Mild	21
Moderate	67
Severe	12

Contrast enhanced CT abdomen and pelvis was done for further evaluation. Modified CT severity index was applied to all cases which categorised them into mild 21%, moderate 67% and severe category 12% as shown in Table 4. 15% had pancreatic necrosis on CT scan. 46.67% cases were diagnosed with pleural effusion, 44.17% cases had ascites, 22.5% had hepatomegaly and 22.5% were diagnosed to have splenomegaly. Splenic vein thrombosis was seen in 16.67% cases, Pancreatic pseudocyst 3.33% and Gall stone 7.5%. The findings are shown in table 5. MRCP was done in 18 cases for further evaluation. Pancreatic duct disruption was noted in 13 cases.

Table 5: Computed tomography scan finding in acute pancreatitis

CT scan finding	Acute pancreatitis	
	Total	%
Pancreatic necrosis	18	15
Hepatomegaly	27	22.5
Splenomegaly	27	22.5
Splenic vein thrombosis	20	16.67
Pancreatic pseudocyst	4	3.33
Gall stone	9	7.5
Ascites	53	44.17
Pleural effusion	56	46.67

Of the 18 patients with necrotising pancreatitis, 13 cases recovered with conservative management with nutritional support with naso-jejunal tube feeding. The mean duration of intensive care unit (ICU) stay for these cases was 10-11 days. 5 cases had percutaneous pig tail catheter insertion for walled off necrosis admitted in the ICU, which eventually succumbed to death had a significantly longer duration of ICU stay with multiple admissions to the ICU. 3 mortality cases had severe necrotising pancreatitis progressing to walled off pancreatic necrosis (WOPN). She underwent ERCP after 2 weeks of admission owing to her hemodynamic instability. Percutaneous pigtail catheter insertion for WOPN and chest tube drainage was done. But patient deteriorated and developed infective myocarditis. Owing to persistent hemodynamic instability surgical intervention could not be done and patient expired due to septicaemia after a prolonged stay. ERCP was done for 13 cases (12.5%). Cholecystectomy was done in the primary admission itself for 40 cases (33.33%). Interval cholecystectomy was done for 80 cases (66.67%)

Discussion

AP is one of the most common conditions presenting as acute abdomen in the emergency department.⁵ Although alcohol induced AP is the most common aetiology in India, the incidence of biliary pancreatitis is increasing. In western countries, ABP is more common than AP secondary to alcohol. ABP is one of the most serious complications of gall stone disease with a high risk of morbidity and mortality.⁶ Hence accurate diagnosis and prompt management of ABP is very crucial.

In our study ABP accounted for 29.48% of all cases of AP admitted to the hospital. This is lesser than studies conducted in the west but is comparable to a study done by Chauhan et al in Dehradun. The mean age of patients with biliary pancreatitis was 52.75 years and male to female ratio was 1:1.5 which was similar to most other studies. The most common presenting symptom was pain abdomen seen in all the patients. All the patients were evaluated with ultrasonography initially followed by contrast enhanced computed tomography (CECT) abdomen and pelvis. Ultrasonography is the most sensitive for picking up gall stones. However, evaluation of the distal cannabidiol and pancreas is usually made difficult by bowel

gas artifacts. CECT is useful in diagnosing pancreatitis and its local complications and defining the severity of the disease. The modified CT severity index was used to define severity of the disease. MRCP was done in selected cases for evaluation of the biliary tree which also was used as a road map for ERCP. Laboratory investigations done to confirm the diagnosis were serum amylase and lipase levels. Serum lipase levels were elevated in all the cases of ABP. Serum lipase levels are the most definitive laboratory investigation for confirming the diagnosis of acute pancreatitis. This is consistent with most of the studies where serum lipase elevation is diagnostic.

In our study about 79% of cases had moderate to severe pancreatitis on CT. 46.67% cases were diagnosed with pleural effusion, 44.17% cases had ascites, 22.5% had hepatomegaly and 22.5% were diagnosed to have splenomegaly. The probable cause for large number of cases having complications may be attributed to delayed presentation or incorrect diagnosis and patients being wrongly treated for gastritis before referral. The patients with mild and moderate pancreatitis were managed conservatively. Those with severe pancreatitis were admitted in the ICU. 13 cases with pancreatic necrosis were managed conservatively. A step-up approach was used in the management of these cases. 5 of these patients had per cutaneous pig tail catheters inserted under radiological guidance to drain the necrosis. They responded to the same and catheters were removed after radiological confirmation of the resolution of the necrotic collections. They were discharged and underwent interval cholecystectomy. They had a stay in the ICU of 10-11 days with IV carbapenems thereby escalating the cost and prolonged hospital stay. Those patients underwent ERCP either for biliary duct disruption or for choledocholithiasis. These patients also recovered and underwent interval cholecystectomy after 6-8 weeks. There were no intraoperative complications reported like biliary injuries or conversion to open surgery. The 3 case which expired had severe pancreatitis with all the complications and a fulminant course with persistent hemodynamic instability. The tube drainage of the necrosis and ERCP in this case was done late during the course of the disease which proved detrimental to the prognosis of the patient. Although infective myocarditis was final complication after which the patient succumbed to death, an early intervention would probably have altered the course of disease in this patient.

Conservative management of ABP with interval cholecystectomy has been an accepted line of management for long. Interval cholecystectomy has been preferred following an attack of pancreatitis.⁷ The proponents of this line of management attribute it to the higher risk of biliary injuries due to a difficult dissection of Calot's triangle following pancreatitis. There is also a presumed higher risk of conversion to open surgery. Also, the non-availability of operating rooms and logistic problems in the emergency setup were also impediments which prompted surgeons to prefer interval cholecystectomy. There was also a belief that early cholecystectomy would have a prolonged hospital stay and an escalation in costs to be borne by the patients.⁸

The PONCHO trial has been one of the biggest multicentre randomised control trials for same admission cholecystectomy in cases of biliary pancreatitis. The results of the trial suggest that in cases of mild biliary pancreatitis same admission cholecystectomy within 72 hours of admission reduced the rate of recurrent gall stone related complications. Also, the cholecystectomy related complications were also fewer.⁹ The cost effectiveness of the same was also studied. Same admission cholecystectomy had the benefit of lesser readmission rate due to gall stone related complications like a recurrent attack of pancreatitis. Early cholecystectomy cases had reduced morbidity and fewer conversions to open surgeries

thereby reducing the costs.¹⁰ A study by Kim et al also proved that a delayed cholecystectomy increases the risk of pancreatico-biliary complications.¹¹

The role of ERCP too was not clearly defined in ABP. Hence it was reserved for cases with proven choledocholithiasis with cholangitis or if there was a biliary duct disruption demonstrated on imaging. Most studies now suggest that an early ERCP must be done. As per a study by Fogel and Sherman all cases of severe pancreatitis must undergo ERCP with sphincterotomy within 72 hours of admission. Even cases without any biliary obstruction with severe pancreatitis must undergo ERCP with sphincterotomy. However, cases of mild biliary pancreatitis without any biliary obstruction may not require ERCP. They may undergo early cholecystectomy.¹² A study by Fan et al suggests early ERCP within 24 hours of admission.¹³ A study in Germany by Folsch et al suggested that ERCP has no benefit in cases without biliary obstruction.¹⁴

In our study most of the cases were managed conservatively. The number of cases undergoing ERCP was much lower. Hence protocols for early interventions would have definitely helped in reducing the morbidity, mortality, duration of stay and costs incurred by the patients. As most recent studies indicate early intervention has to be the rule in managing acute biliary pancreatitis.¹⁵

Conclusion

The study suggests that early intervention definitely reduces morbidity, mortality and recurrent admissions in cases of acute biliary pancreatitis. An early laparoscopic cholecystectomy may be done in all mild biliary pancreatitis cases with very little risk of complications. An early ERCP is required in severe cases irrespective of biliary obstruction

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Received: 10-06-2020 / Revised: 30-06-2020 / Accepted: 10-07-2020