

Moderate acute pancreatitis with pleural effusion and impaired kidney functions

O H Lumbantoruan^{1*} and L B Dairi¹

¹Division of Gastroenterohepatology, Department of Internal Medicine, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia

*Corresponding author: ottolumbantoruan@gmail.com

Abstract. Acute pancreatitis is a pancreatic inflammatory reaction that is clinically characterized by acute abdominal pain accompanied by elevated amylase and lipase enzymes. A 57-year-old female patient came to the emergency department with the main complaint of localized pain in the epigastric region within the last three days. Blood pressure 130/90mmHg, pulse 90x/i, RR 20x/i, temperature 37°C, sub-icteric on the eyes and tenderness in the epigastric region. Laboratory findings were leukocytosis, increased amylase, and lipase, elevated liver enzymes, hypoalbuminemia, elevated Kidney Functions, acidosis, and hypoglycemia. Abdominal CT-Scan revealed a partially lobulated edge with solid and necrotic components of the caput pancreas and widespread suspicion to the pancreatic corpus. The mass appeared to cause widening of the biliary and intrahepatic systems with minimal right pleural effusion. The liver was slightly enlarged. The patient was with acute pancreatitis and treated with the installation of an open nasogastric tube, and resuscitated with ringer lactate fluid followed by IVFD D5%. Patients fasted for three days before giving a low fat, protein diet, antibiotic and proton pump inhibitors for seven days. After nine days, amylase and lipase levels decreased with significant clinical improvement. The next three days, the patient was discharged.

1. Introduction

Pancreatitis is a reaction to pancreatic inflammation. Clinically, acute pancreatitis is acute abdominal pain accompanied by elevated enzymes in the blood and urine. The incidence of pancreatitis varies. In western countries, the disease is often found and is closely related to alcohol abuse and hepatobiliary disease. Frequencies range from 0.14%-1% or 10-50 patients to 100,000 inhabitants. A study conducted by Yadav and Lowenfels in 2013 showed that the incidence of acute pancreatitis in the United States reached 13-45 per 100,000 population, while in Asia the incidence was 20-125 per 100,000 population. In Indonesia, the incidence of acute pancreatitis at 10-20 years \pm 16.1% and at age 41-50 years \pm 21.8%.[1]

2. Methods

A 57-year-old female patient came to the emergency department with a main complaint of pain in the epigastric region within the last three days. The pain was localized. There is no complaint of fever, nausea, and vomiting. History of right abdominal pain, history of jaundice or alcohol or drug consumption were not present. The vital signs were blood pressure 130/90mmHg, pulse 90x/i, respiratory frequency 20x/i, and body temperature 37°C. On physical examination, we found sub-icteric on the eyes and tenderness in the epigastric region. There were no Cullen's sign and gray



turner's sign. Laboratory findings were leukocytosis (WBC 22680/mm³), increased amylase (925U/L) and lipase (885U/L), elevated liver enzymes (Total Bilirubin 2mg/dl, Direct bilirubin 1.32mg/dl), Hypoalbuminemia (Alb 2.5), Elevated Kidney Functions (Ur 102.6mg/dl, Cr 1.67mg/dl), Acidosis (pH 7.272, pCO₂ 27.2, pO₂ 157.8mmHg, HCO₃ 12.3, and BE -13.2) and hypoglycemia (56.2mg/dl). Abdominal radiography found minimal dilatation of the transversal colon with no visible free air and normal abdominal ultrasonography. Abdominal CT-Scan revealed a relatively secure heterogeneous area with a partially lobulated edge with solid and necrotic components of the caput pancreas and widespread suspicion to the pancreatic corpus. The mass appears to cause widening of the biliary and intrahepatic systems. There was a minimal right pleural effusion with a second basal infiltrate of the lung. Liver size slightly enlarged. The patient was with acute pancreatitis and treated with the installation of an open nasogastric tube, and resuscitated with ringer lactate fluid followed by IVFD D5%. Patients fasted for three days before given a low-fat diet and protein diet. Patients were given antibiotic (ceftazidime 1g/8 hours IV) and Inj. Omeprazole 20mg/12 hours for seven days. After nine days of therapy, amylase and lipase levels decreased (Amylase 228U/I and Lipase 188U/I) with significant clinical improvement. In the next three days, the patient was discharged.

3. Discussion

There are many causes of acute pancreatitis (Table 1), but the mechanisms by which these conditions trigger pancreatic inflammation have not been fully elucidated. Gallstones continue to be the leading cause of acute pancreatitis in most series (30–60%). Acute pancreatitis has a risk in patients with at least one gallstone <5 mm in diameter is fourfold greater than that in patients with larger stones. Alcohol is the second most common cause, responsible for 15–30% of cases in the United States. The incidence of pancreatitis in alcoholics is low (5/100,000), indicating that in addition to the amount of alcohol ingested unknown factors affect a person's susceptibility to pancreatic injury. The mechanism of injury is incompletely understood. Hypertriglyceridemia is the cause of acute pancreatitis in 1.3–3.8% of cases; serum triglyceride levels are usually >11.3 mmol/L (>1000mg/dL). For 10-30% of cases, the etiology factors were unknown.[1,2,4,5,6] In this case, the etiological causes were unknown since the patient wasn't alcoholic, no visible gallstones, and no hypertriglyceridemia.

Table 1. Causes of acute pancreatitis.

Common Causes
Gallstones (including microlithiasis)
Alcohol (acute and chronic alcoholism) Hypertriglyceridemia
Endoscopic retrograde cholangiopancreatography (ERCP), especially after biliary manometry
Trauma (especially blunt abdominal trauma)
Postoperative (abdominal and nonabdominal operations)
Drugs (azathioprine, 6-mercaptopurine, sulfonamides, estrogens, tetracycline, valproic acid, anti-HIV medications)
Sphincter of Oddi dysfunction
Uncommon Causes
Vascular causes and vasculitis (ischemic-hypoperfusion states after cardiac surgery)
Connective tissue disorders and thrombotic thrombocytopenic purpura (TTP)
Cancer of the pancreas
Hypercalcemia
Periampullary diverticulum
Pancreas divisum
Hereditary pancreatitis
Cystic fibrosis
Renal failure

Rare Causes
Infections (mumps, coxsackievirus, cytomegalovirus, echovirus, parasites)
Autoimmune (e.g., Sjögren's syndrome)
Causes to Consider in Patients with Recurrent Bouts of Acute Pancreatitis without an Obvious Etiology
Occult disease of the biliary tree or pancreatic ducts, especially microlithiasis, sludge
Drugs
Hypertriglyceridemia
Pancreas divisum
Pancreatic cancer
Sphincter of Oddi dysfunction
Cystic fibrosis
Idiopathic

On physical examination, abdominal pain or tenderness is the main symptom of acute pancreatitis. The intensity of the pain may vary and is sedentary in the epigastric or periumbilical areas. Pain may spread to the back, chest or lower abdomen region of the patient. Abdominal distension may accompany pain due to decreased motility of the stomach and intestines. Reduced or absent of bowel sounds usually suggesting a paralytic ileus. With deep palpation, a mass in the epigastrium can be due to pancreatic swelling. Specific signs such as Cullen's sign and Turner's Sign rarely found and usually indicates a severe necrosis process. In the eye, jaundice or sub-icteric can be in several cases. In this case, we found tenderness in the epigastric region that increased in intensity within the last three days before the patient admitted to the emergency ward.[1,2,4,8]

Based on laboratory findings, usually an elevated amylase and lipase level may be up to 3 times the normal value can be found. This value can be a benchmark for diagnosis if there are no signs of perforation, ischemia or infarction. Based on a study, elevated amylase and lipase levels correlated with disease severity. The increase in levels can last up to 7-14 days. On routine blood examination, leukocytosis (leukocyte levels 15000-20000/mm³) and 15-20% of cases are often followed by hypertriglyceridemia. In this case, elevated amylase levels (925U/L), lipase (885U/L), leukocyte (22680/mm³) and triglyceride 146 mg/dl were found.[1,2,9]

Based on the radiological examination, abdominal ultrasonography is as an initial diagnostic tool for gallstone evaluation and caput pancreas problems, especially in emergency cases. For further diagnosis, an abdominal CT-scan may be performed. Following the revised Atlanta criteria (table 2), generally in cases of acute pancreatitis can be found: *1.interstitial pancreatitis; 2.necrotizing pancreatitis; 3.acute pancreatitis fluid collection; 4.pseudocyst pancreatitis; 5.acute necrotic collection; and 6.walled-off pancreatic necrosis*. In this case, ultrasound examination shows the pancreas within normal limits, and on CT-Scan there was a relatively secure heterogeneous area with partial lobulated edges with solid and necrotic components in the caput pancreas suspected to have expanded to the pancreatic corpus.[2]

Table 2. Terms used in the new classification based on contrast-enhanced computed tomography.[2]

interstitial edematous pancreatitis: "inflammation" or stranding in the pancreatic and/or peripancreatic tissues without tissue necrosis
CECT criteria
– pancreatic parenchyma enhances with the contrast agent
– lack of peripancreatic necrosis
necrotizing pancreatitis: pancreatic parenchymal necrosis and/or peripancreatic necrosis
CECT criteria
– pancreatic parenchymal areas without enhancement by intravenous contrast agent and/or
– peripancreatic necrosis (see below – acute necrotic collection and walled-off necrosis)

acute peripancreatic fluid collection: peripancreatic fluid occurring in the setting of interstitial edematous pancreatitis; this peripancreatic fluid occurs within the first 4 weeks of interstitial edematous pancreatitis

CECT criteria

- homogeneous fluid adjacent to pancreas confined by peripancreatic fascial planes
- no recognizable wall

pancreatic pseudocyst: an encapsulated, well-defined collection of fluid but no or minimal solid components which occurs >4 weeks after onset of interstitial edematous pancreatitis.

CECT criteria

- well-circumscribed, homogeneous, round or oval fluid collection
- no solid component
- well-defined wall
- occurs only in interstitial edematous pancreatitis

acute necrotic collection: a collection of both fluid and solid components (necrosis) occurring during necrotizing pancreatitis. This collection can involve the pancreatic and/or the peripancreatic tissues

CECT criteria

- heterogeneous, varying of non-liquid density
- no encapsulating wall
- intrapancreatic and/or extrapancreatic

walled-off necrosis: a mature, encapsulated acute necrotic collection with a well-defined inflammatory wall; these tend to mature >4 weeks after onset of necrotizing pancreatitis.

CECT criteria

- heterogenous liquid and non-liquid density
 - well-defined wall
 - intrapancreatic and/or extrapancreatic
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The diagnosis of acute pancreatitis should comply with 2 of the following three criteria: typical “pancreatitis” abdominal pain (onset of acute and persistent pain and widespread). Elevated serum amylase and lipase levels up to 3 times the normal value, and typical findings of acute pancreatitis on radiological examination (ultrasound, CT-Scan).[8] In this case, the entire criterion is encountered, so the patient was with acute pancreatitis.

Furthermore, the classification of the severity of acute pancreatitis can be into mild, moderate, and severe. In mild cases, there are no local complications or signs of organ failure. In moderate cases, signs of organ failure are recovered within <48 hours, or local complications are found. The patient improves within the treatment >1 week. In severe cases, there were signs of persistent organ failure (>48 hours) and involving more than one organ.[8-10] In this case, there were signs of complications such as pleural effusion and renal impairment that improved after 48 hours of therapy. Based on the findings, the patient was as moderate acute pancreatitis.

The goal of treatment for acute pancreatitis is to stop the inflammatory process and autodigestion or at least stabilize the patient's clinical state to allow the healing process to occur. In most cases, conservative ways give good results. Conservative actions were: strong analgesics, fast the patient and suction of gastric fluid to reduce gastrin release from the stomach and prevent gastric acid from entering the duodenum to alleviate the action of pancreas. However, in cases of severe acute pancreatitis, the mortality rate is still high because of the occurrence of necrosis in the organ so that sometimes surgery is required.[8-10] In this case, the patient has installed a nasogastric tube, parenteral fluid administration, injection of antibiotics, and proton pump inhibitor for nine days.

4. Conclusion

We reported one case of acute pancreatitis based on diagnostic criteria of typical pancreatitis abdominal pain, elevated amylase and lipase levels up to 3 times the normal value, and a CT-scan image of necrosis in the head of the pancreas. After 9-11 days of therapy, clinical improvement was found, and the patient was discharged for outpatient treatment.

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