pancreatitis

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- Pancreatitis is an inflammatory process of the pancreas that may be limited to just the pancreas, may affect surrounding tissues, or may cause remote organ system dysfunction.

Most cases are related to either **gallstones** or alcohol consumption. About 5% of all patients who undergo endoscopic retrograde cholangiopancreatography(ERCP) for treatment of gallstones develop pancreatitis within 30 days.

- Alcohol use and pancreatitis have a complex relationship, thought to be founded in toxicity and immunologic mechanisms.

- Over 500 drugs have been linked to acute pancreatitis, but together, they account for fewer than 2% of cases.

- Medications associated with acute pancreatitis can be categorized into three groups:
- antiretrovirals,
- chemotherapy,
- immunosuppressants.

- Cancer patients undergoing chemotherapy with one or more of seven medications have a risk of pancreatitis complicating the disease course.

- These medications are L-asparaginase, cisplatin, cytarabine, ifosfamide, mercaptopurine, pegaspargase, and tamoxifen.
- These agents are used to treat leukemias, lymphomas, sarcomas, and breast, cervical, lung, ovarian, and testicular cancers.
- Patients receiving azathioprine for posttransplantation immunosuppression or treatment of inflammatory diseases such as rheumatoid arthritis and inflammatory bowel disease are also at risk of developing pancreatitis.

CLINICAL FEATURES

- Acute pancreatitis causes acute, severe, and persistent abdominal pain, usually associated with nausea, vomiting, anorexia, and decreased oral intake.
- The pain is located in the epigastrium or occasionally in one or both upper quadrants. Pain may radiate to the back, chest, or flanks. Pain may worsen with oral intake or lying supine and may improve with sitting up with the knees flexed.

- Vital signs may be abnormal, with tachycardia, tachypnea, fever, or hypotension. Pain is often associated with guarding and decreased bowel sounds.
- Occasionally patients will be jaundiced, pale, or diaphoretic.

DIAGNOSIS

- Formal diagnosis is based on at least two of three criteria:
- (1) clinical presentation consistent with acute pancreatitis,
- (2) a serum lipase or amylase value significantly elevated above the upper limit of normal, or
- (3) imaging findings characteristic of acute pancreatitis (IV contrastenhanced CT, MRI, or transabdominal US).

LABORATORY STUDIES

- There is no gold standard laboratory diagnosis for acute pancreatitis.
- Two current guidelines recommend that the amylase or lipase value be at least three times the upper limit of normal.

- some recommend a lipase of two times normal or an amylase of three times normal in a patient with the appropriate clinical presentation.
- some recommend that any elevation above normal is consistent with the diagnosis.

- Amylase is not a good choice for diagnosis. Amylase rises within a few hours after the onset of symptoms, peaks within 48 hours, and normalizes in 3 to 5 days.
- About 20% of patients with pancreatitis, most of whom have alcohol- and hypertriglyceridemia-related disease, will have a normal amylase.

- Lipase is more specific to pancreatic injury and remains elevated for longer after the onset of symptoms than amylase.
- Although lipase may be elevated in diabetes and some nonpancreatic diseases such as renal disease, appendicitis, and cholecystitis, it is less associated with nonpancreatic diseases than amylase.

- Lipase is more sensitive both in patients with a delayed presentation and in pancreatitis associated with alcohol use and hypertriglyceridemia.

- If a combination of elevated lipase and amylase is used to diagnose pancreatitis, the diagnosis is more specific and less sensitive than when using elevation in only one value.

- In addition to serum lipase and amylase, obtain blood studies to evaluate renal and liver function, electrolyte status, glucose level, WBC count, and hemoglobin/hematocrit.

- An alanine aminotransferase of >150 U/L within the first 48 hours of symptoms predicts gallstone pancreatitis with a greater than 85% positive predictive value.

IMAGING

- Imaging can identify the cause of pancreatitis and can identify complications and severity. For patients with acute pancreatitis where gallstones have not been excluded, obtain a transabdominal US in the ED to detect gallstone pancreatitis.

- In patients who meet the clinical presentation and laboratory criteria, routine early CT, with or without IV or PO contrast, is not recommended.

- There is no evidence that early CT, with or without contrast, improves clinical outcomes, possibly because CT findings are delayed compared to clinical presentation and may underestimate disease severity.

- Peripancreatic fluid collections or pancreatic necrosis detected by CT of any kind within the first few days of symptoms generally require no treatment, and the complete extent of these local complications is usually not appreciated until at least 3 days after onset of symptoms.

- If the clinical diagnosis of acute pancreatitis is in doubt, consider further evaluation with IV contrast abdominal CT.
- Characteristic findings include:
- (1) pancreatic parenchymal inflammation with or without peripancreatic fat inflammation;
- (2) pancreatic parenchymal necrosis or peripancreatic necrosis;
- (3) peripancreatic fluid collection;
- (4) pancreatic pseudocyst.

- Although noncontrast MRI is not readily available to the ED, this imaging modality can identify the complications of pancreatitis and choledocholithiasis. It can be an alternative for patients with renal failure, patients who are allergic to IV contrast, or pregnant patients.

TREATMENT

- Treatment is supportive and symptom based. No specific medication effectively treats acute pancreatitis; however, early aggressive hydration decreases morbidity and mortality.

- The benefit of fluid resuscitation may result from increased micro- and macrocirculatory support of the pancreas, which prevents complications such as pancreatic necrosis.

- Provide fluid resuscitation. Fluid loss results from vomiting, third spacing, increased insensible losses, and decreased oral intake. Patients generally need a total of 2.5 to 4 L of fluid over the first 12 to 24 hours.

- In the situation of renal or heart failure, deliver fluid more slowly to prevent complications such as volume overload, pulmonary edema, and abdominal compartment syndrome.

- Crystalloids are the resuscitation fluids of choice. Normal saline in large volumes may cause a non gap hyperchloremic acidosis and can worsen pancreatitis, possibly by activating trypsinogen and making acinar cells more susceptible to injury.

- A single randomized study showed a decreased incidence of systemic inflammatory response syndrome in patients who received lactated Ringer’s instead of 0.9% normal saline.

- Regardless of which fluid is selected, monitor vital signs and urine output for response to hydration.
- Control pain and nausea.
- Pain control is best achieved with IV opioid analgesics.
- Initially, place patients on NPO (nothing by mouth) status and administer antiemetics. There is no benefit to nasogastric intubation.

- Prolonged bowel and pancreas rest increases gut atrophy and bacterial translocation, leading to infection and increasing morbidity and mortality.
- In the ED, if nausea and vomiting have resolved and pain has decreased, transition the patient to oral pain medications and small amounts of food. A low-fat solid foods diet provides more calories than a clear liquid diet and is safe.

- Acute pancreatitis by itself is not a source of infection, and prophylactic use of antibiotics and antifungals is not recommended.
- Administer antibiotics if a source of infection is demonstrated, such as cholangitis, urinary tract infection, pneumonia, or infected pancreatic necrosis.

COMPLICATIONS OF ACUTE PANCREATITIS

- Moderately severe acute pancreatitis is characterized by transient organ failure (48 hours).
- Critical acute pancreatitis is defined as persistent organ failure and infected pancreatic necrosis.

- Local complications, including acute peripancreatic fluid collections, pancreatic pseudocyst, acute pancreatic or peripancreatic necrosis, walled off necrosis, gastric outlet dysfunction, splenic and portal vein thrombosis, and colonic inflammation/necrosis, are not usually well demonstrated on CT scan until at least 72 hours after the onset of symptoms.

- Suspect local complications in patients who have persistent or recurrent abdominal pain, an increase in pancreatic enzyme levels after an initial decrease, new or worsening organ dysfunction, or sepsis (fever, increased WBC count).

- Organ failure can be seen in any system, but three organ systems are particularly susceptible:
- cardiovascular,
- respiratory,
- renal.
- Because of the susceptibility of these three organ systems, pay special attention during the patient's initial evaluation.

PREDICTION OF DISEASE SEVERITY

- Systemic inflammatory response syndrome at admission and persistent at 48 hours predicts severe acute pancreatitis more simply and as accurately as the various scoring systems.
- Besides systemic inflammatory response syndrome, a number of other clinical findings at initial assessment are associated.

- These findings include patient characteristics (age >55 years, obesity, altered mental status, comorbidities), laboratory findings (BUN >20 milligrams/dL or rising; hematocrit >44% or rising; increased creatinine), and radiologic findings (many or large extrapancreatic fluid collections, pleural effusions, pulmonary infiltrates)

DISPOSITION AND FOLLOW-UP

- Patients with nonbiliary pancreatitis whose pain can be controlled in the ED and who can tolerate oral feeding can be discharged. Patients who are discharged from the ED should be referred for appropriate follow-up to help prevent recurrence.

- Consider admission
- first bout of acute pancreatitis, for any case of biliary pancreatitis, and for patients needing frequent IV pain medication, not tolerating oral intake because of vomiting or increasing pain, with persistent abnormal vital signs, or with any signs of organ insufficiency (e.g., increased creatinine)