ACUTE PANCREATITIS

Introduction

Principal function of the pancreas is to make food-digesting enzymes (exocrine) and Insulin (endocrine). The pancreas, comprising only 0.1% of total body weight, has 13 times the protein-producing capacity of the liver and reticulo endothelial system combined, which make up 4% of total
body weight.

Several mechanisms enable the pancreas to avoid digesting itself. First, proteins are translated into an inactive form called pro enzymes. The pro enzymes are packaged in a para- crystalline arrangement with protease inhibitors

Zymogen granules have an acidic pH and a low calcium concentration, which are factors that guard against premature activation

Under various conditions, these protective mechanisms are disrupted, resulting in intracellular enzyme activation and pancreatic auto digestion, a condition called acute pancreatitis. This condition typically causes abdominal pain, usually associated with elevated pancreatic enzyme levels in the blood and inflammation of the pancreas.

Mortality/Morbidity:

The overall mortality rate of patients with acute pancreatitis is 10-15%.

In patients with severe disease, the mortality rate is approximately 30%.

In the first week of illness, most deaths result from multiorgan system failure.

In subsequent weeks, infection plays a more significant role, but organ failure still constitutes a major cause of mortality.

Sex:

In general, acute pancreatitis affects males more often than females.

The etiology in males is more often related to alcohol; in females, to biliary tract disease.

History:

The cardinal symptom of acute pancreatitis is abdominal pain, which is characteristically dull, boring, and steady. Most often, it is located in the upper abdomen, usually in the epigastric region, but it may be perceived more on the left or right side, depending on which portion of the pancreas is involved.

The pain radiates to the back in approximately half of cases.

The duration of pain varies but typically lasts more than a day.

The pain may be aggravated by eating or lying supine and it may be alleviated by fasting or lying on the left side with the knees and hips flexed.

Associated symptoms (eg, anorexia, nausea, vomiting) are common, and some patients experience diarrhea due to indigestion.

Avulsion to fatty foods may be reported.

Physical:

The following physical examination findings vary with the severity of the disease.

1.Fever (76%) and tachycardia (65%) are common abnormal vital signs.

2. Abdominal tenderness, muscular guarding (68%), and distension (65%) are observed in most patients. Bowel sounds are often hypoactive.

-A minority of patients exhibit jaundice (28%).

-Some patients experience dyspnea (10%), which may be caused by irritation of the diaphragm (resulting from inflammation) or by a more serious condition, such as respiratory distress syndrome.

-In severe cases, hemodynamic instability is evident (10%) and hematemesis or melena sometimes develops (5%).

-A few uncommon physical findings are associated with severe necrotizing pancreatitis.

- The **Cullen sign** is a bluish discoloration around the umbilicus resulting from hemoperitoneum.
- The **Grey-Turner sign** is a reddish-brown discoloration along the flanks resulting from retroperitoneal blood dissecting along tissue planes.
- Erythematous skin nodules may result from focal subcutaneous fat necrosis.
- Rarely, abnormalities on funduscopic examination may be seen in severe pancreatitis**. Purtscher retinopathy**, this ischemic injury to the retina appears to be caused by activation of complement and agglutination of blood cells within retinal vessels. It may cause temporary or permanent blindness.

Causes: Although pancreatitis has numerous etiologies, alcohol dependence and biliary tract disease cause most cases. In 10-30% of cases, the cause is unknown, and careful evaluation may identify a rare etiology in 10% of cases.

1. **Biliary tract disease** (approximately 38%)

The most common cause of acute pancreatitis is gallstones passing into the bile duct and temporarily lodging at the sphincter of Oddi. The risk of a stone causing pancreatitis is inversely proportional to its size.

Abnormal anatomy (eg, choledochal cysts, juxtapapillary diverticula) is also associated with acute pancreatitis.

2**. Alcohol** (approximately 35%)

Alcohol abuse is a major cause of pancreatitis, evidence shows that alcohol may cause acute pancreatitis in the absence of chronic disease.

3**. Post-ERCP** (approximately 4%)

4. Trauma (~1.5%)

Abdominal trauma causes an elevation of amylase and lipase levels in 17% of cases and clinical pancreatitis in 5% of cases.

5. Drugs (~1.4%)drug-induced pancreatitis is usually mild.

Drugs definitely associated with acute pancreatitis include azathioprine, sulfonamides, sulindac, tetracycline, valproic acid, didanosine, methyldopa, estrogens, furosemide, 6-mercaptopurine, pentamidine, 5-aminosalicylic acid compounds, corticosteroids, and octreotide.

6. Infection (<1%))Viral causes include mumps, Epstein-Barr, coxsackievirus, echovirus, varicella-zoster, and measles.

Bacterial causes include *Mycoplasma pneumoniae, Salmonella, Campylobacter,* and *Mycobacterium tuberculosis.*

Worldwide, ascariasis is a recognized cause of pancreatitis resulting from the migration of worms in and out of the duodenal papillae.

Pancreatitis has been associated with AIDS; however, this may be the result of opportunistic infections, neoplasms, or drug therapies

7**.Hereditary pancreatitis (<1**%)

This type of pancreatitis is an autosomal dominant disorder related to mutations of the cationic trypsinogen gene

8. **Hypercalcemia (<1%)**

Hypercalcemia from any cause can lead to acute pancreatitis

9. Developmental abnormalities of the pancreas (<1%)

10. **Hypertriglyceridemia (<1%)**

11.**Tumor (<1%)**

Obstruction of the pancreatic ductal system by a pancreatic ductal carcinoma, ampullary carcinoma, cholangiocarcinoma, or metastatic tumor can cause acute pancreatitis.

Differentials

Same as acute abdomen

Lab Tests

1.Amylase and lipase

Serum amylase and lipase levels are typically elevated in persons with acute pancreatitis. However, these elevations may only indicate pancreatitis.

Serum amylase determinations are routinely available, but they are not specific for pancreatitis.

Elevations can occur in anyone with small intestinal obstruction, mesenteric ischemia, tuba-ovarian disease, renal insufficiency, or macroamylasemia. Rarely, elevations may reflect parotitis.

2.Liver-associated enzymes

Determine alkaline phosphatase, total bilirubin, aspartate aminotransferase, and alanine aminotransferase levels to search for evidence of gallstone pancreatitis.

Imaging

1.**Abdominal radiography**

These radiographs are primarily used to detect free air in the abdomen, indicating a perforated viscus.

The presence of calcifications within the pancreas may indicate chronic pancreatitis.

2.**Abdominal ultrasonography**

This is the most useful initial test in determining the etiology of pancreatitis and is the technique of choice for detecting gallstones.

3. **Abdominal CT scanning**

This is generally not indicated for patients with mild pancreatitis unless a pancreatic tumor is suspected (usually in elderly patients). CT scanning is always indicated in patients with severe acute pancreatitis and is the imaging study of choice for assessing complications.

Dynamic spiral CT scanning is used to determine the presence and extent of pancreatic necrosis

4. Magnetic resonance cholangiopancreatography

Magnetic resonance cholangiopancreatography (MRCP) has an emerging role in the diagnosis of suspected biliary and pancreatic duct obstruction in the setting of pancreatitis. MRCP is safer, noninvasive, and fast, and it provides images useful in guiding clinical care decisions.

5. **Endoscopic ultrasonography (EUS**) is an endoscopic procedure that allows a high-frequency ultrasound transducer to be inserted into the gastrointestinal tract to visualize the pancreas and the biliary tract.

6**.CT-guided needle aspiration** This procedure is used to differentiate infected necrosis and sterile necrosis in patients with severe necrotizing