

# Acute Pancreatitis

- Acute inflammatory process of the pancreas
- Important differential diagnosis for acute onset abdominal pain

## Causes

- Gallstone/biliary sludge and microcalculi
- Alcohol
- Biliary obstruction—tumors, ascariasis, periampullary diverticula
- Hypertriglyceridemia ( $>1000$  mg/dL)
- Hypercalcemia
- Post-ERCP
- Infections—mumps, *Leptospira*, *Salmonella*, HSV, CMV, HIV
- Drugs—Azathioprine, sulfonamides, valproic acid, ART, tetracyclines
- Trauma—blunt abdominal injuries
- Anatomical—divisum, pancreatic diverticulum,
- Hereditary—SPINK, PRSS-1, CASR, CTFR, CFTR (cystic fibrosis)
- Autoimmune

## Clinical Presentation

Local symptoms and signs

- Abdominal pain
  - Epigastric and periumbilical
  - Acute—continuous boring nature and radiating to back
  - Increases with food relieved on bending forward
  - Mild discomfort to severe distress
- Nausea and vomiting
- Abdominal distention—ileus/ascites
- Epigastric tenderness—maybe diffuse
- Guarding/rigidity
- Icterus—if head is involved or in biliary obstruction
- Periumbilical (Cullen) and flank discoloration (Grey-Turner)—retroperitoneal bleeding

## Laboratory Investigations

- Pancreatic enzymes: Elevated lipase and amylase ( $>3$  times upper limit of normal)
  - Lipase
    - ♦ More sensitive (82–100%)

- ♦ Starts rising within 4–8 hours of symptom onset
- ♦ Peaks at 24 hours; lasts for 8–14 days
- Amylase: Less sensitive (67–83%); (specificity 85–98%)
  - Rises within 6–12 hours of symptom onset; returns to normal by 3–5 days
  - Can be positive in parotitis, pancreatic pseudocyst, post-ERCP, alcoholism

#### **Note**

Amylase levels may be normal in pancreatitis secondary to hypertriglyceridemia.

- Other novel enzyme markers
  - Trypsinogen activation peptide (TAP)-early elevation; can predict severity
  - Trypsinogen-2 levels-serum and urine levels
- Elevated CRP/leukocytosis
- Hemoconcentration/elevated urea
- Hypocalcemia/hyperglycemia/hypoglycemia
- Liver function tests for obstructive jaundice due to gallstones

#### **Imaging**

- Abdomen X-ray
  - Colon cut-off sign—for head of pancreas
  - Sentinel loop sign—for head of pancreas and duodenum dilatation
  - Calcification of pancreas—for acute on chronic pancreatitis
- Ultrasound abdomen—diffusely enlarged and hypoechoic pancreas
  - Gallstones, peripancreatic fluid and ascites
- CECT abdomen (preferred imaging) timing: After 3 days of symptoms
  - Differentiates between acute interstitial edematous (contrast enhancing) from necrotic pancreatitis (lacks contrast enhancement) pancreatitis
  - Helps in establishing the presence and extent of pancreatic necrosis (gas present) and local complications and to predict the severity of the disease
  - Also helps in assessing severity—by the CT-severity index
- MRI
  - MRCP—higher sensitivity for diagnosis of early acute pancreatitis
  - Better visualisation of pancreatic and bile ducts

#### **Diagnosis**

##### **Severity determination**

Modified Marshall's score

- Mild acute pancreatitis—absence of organ failure and local or systemic complications
- Moderately severe acute pancreatitis—transient organ failure (resolves within 48 hours) and/or local or systemic complications without persistent organ failure
- Severe acute pancreatitis—persistent organ failure (>48 hours) that may involve one or multiple organs

BISAP score

- B: BUN >25 mg/dL
- I: Impaired mental status
- S: SIRS

- A: Age >60 years
- P: Pleural effusion
- Presence of 3+—substantially increased risk for in-hospital mortality

### MANAGEMENT

- 85–90% self limited,
- Subside spontaneously within 3–7 days of supportive treatment  
Nil per oral—to rest the pancreas
- Aggressive fluid resuscitation for hypotension:  
IV fluids – NS/RL at 15–20 mL/kg bolus (1000 ml to 1500 mL)
  - followed by 3 ml/kg/hr (around 200 ml/hr)
  - to maintain urine output at more than 0.5 ml/kg/hr
- For other patients 3–5 ml/kg/hr maintenance
  - Assess vitals, SpO<sub>2</sub>, fluid status every few hours once—to decide on rate of fluid resuscitation
  - Monitor hematocrit and urea every 8 – 12 hours if increasing—repeat fluid bolus challenge
- IV analgesics—IV paracetamol (1 g IV q8 h), opioids (tramadol 50 mg q12 h – q8 h), NSAIDs (Lornoxicam 8 mg q12 h)
- Nutrition: Low-fat solid diet, soon after the pain has resolved in mild cases; in severe cases—enteral nutrition (gastric/nasojejunal) > TPN; maintains gut barrier integrity, limits bacterial translocation, less expensive, lesser complications
- No role for antibiotics (irrespective of fever and leukocytosis), unless there is a proof of infection

### Specific Treatment

- Gallstone pancreatitis—ERCP within 24–48 hours of admission;
- Cholecystectomy after acute event resolves
- Hypertriglyceridemia—insulin infusion, heparin, plasmapheresis
- Treat the precipitating cause
- NSAIDs and pancreatic duct stenting—decreases incidence of post-ERCP pancreatitis

### Complications

#### Local

- Acute peripancreatic fluid collection
- Necrosis—sterile/infected
- Pseudocyst formation
- Peripancreatic vascular complications—splenic vein thrombosis, pseudoaneurysm
- Pleural effusion
- Pancreatic ascitis

#### Systemic

- ARDS
- Pleural effusion
- Renal failure
- Cardiovascular collapse and hypotension.