



Original Research Article

Understanding Pancreatitis: A conceptual and clinical Perspective

Article History:

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Received: 11-11-2025

Revised: 27-11-2025

Accepted: 16-12-2025

Published: 31-12-2025

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Abstract: Pancreatitis is an inflammatory condition of the pancreas that may present in acute or chronic forms, each with distinct pathophysiological and clinical characteristics. Pancreas plays a dual role in digestive enzyme production and hormonal regulation, both of them are compromised during inflammation. This article provides an in-depth summary of pancreatitis, detailing its prevalence, classification, causes, and pathophysiology. Acute pancreatitis is commonly caused by gallstones and alcohol consumption, while chronic cases often result from long-standing alcohol abuse or genetic predispositions. Clinical features vary from severe abdominal pain and systemic symptoms in acute cases to progressive digestive dysfunction and diabetes in chronic forms. Diagnosis is established through clinical evaluation, elevated enzyme levels, and imaging studies such as ultrasound and CT scans. Management strategies include supportive care, nutritional support, enzyme replacement, and surgical interventions, depending on the disease type and severity. The article also highlights complications such as necrosis, pseudocysts, and increased cancer risk, emphasizing the importance of early prevention, including lifestyle modification and genetic counseling. Continued research and innovation are vital for improving diagnostic and therapeutic outcomes in patients with pancreatitis.

Keywords: Pancreatitis; Acute pancreatitis; Chronic pancreatitis; Diagnosis; Management; Complications

INTRODUCTION

Pancreatitis is a condition where the pancreas becomes inflamed. It plays a critical role in digestion and blood sugar regulation. It has two main jobs: releasing digestive enzymes (exocrine function) and producing hormones like insulin and glucagon (endocrine function). There are two main forms: **acute pancreatitis**, which starts suddenly and may heal with treatment, and **chronic pancreatitis**, which develops over time and leads to permanent damage.^[1] Pancreatitis develops when digestive enzymes are prematurely activated within the pancreas, leading to self-digestion and inflammation of the organ. If not treated properly, it can result in serious health problems like organ failure or death. Pancreatitis is a leading reason for hospital stays and often causes significant illness and complications.^[2]

1. Prevalence and Epidemiology

Acute pancreatitis is a significant global health problem, with an annual incidence of approximately **13–45 cases per 100,000 population**. The etiological distribution of acute pancreatitis varies markedly by geographic region. In **the United States and Europe, alcohol consumption accounts for nearly 40–70%** of cases, making it the most common cause in these regions, followed by gallstones contributing to **20–40%** of cases. In **India, gallstones (biliary pancreatitis)** are the predominant cause, responsible for approximately **50–60%** of cases, while alcohol- related pancreatitis accounts for **20–30%**. In **tropical regions**, tropical pancreatitis, often linked to **malnutrition and genetic factors**, contributes to around **5–10%** of cases and is more commonly observed among younger individuals. Gender-wise distribution shows that **men are more frequently affected due to alcohol-related pancreatitis**, whereas **women predominantly develop gallstone-induced pancreatitis**.

2. Types of Pancreatitis

Pancreatitis is categorized based on how long it lasts, what causes it, and how it progresses:

- **Acute Pancreatitis (AP):** Appears suddenly and ranges from mild to severe. Severe cases can lead to serious complications or death.
- **Chronic Pancreatitis (CP):** Develops slowly over time and leads to permanent damage, often causing long- term pain, digestive problems, and diabetes.
- **Autoimmune Pancreatitis (AIP):** A rare form where the body’s immune system attacks the pancreas. Often linked to high levels of IgG4.^[4]
- **Hereditary Pancreatitis:** A rare genetic form of pancreatitis caused by mutations in genes such as **PRSS1, SPINK1, CFTR, or CTRC**, leading to recurrent pancreatitis from early life and progression to chronic disease.

3. Acute vs Chronic

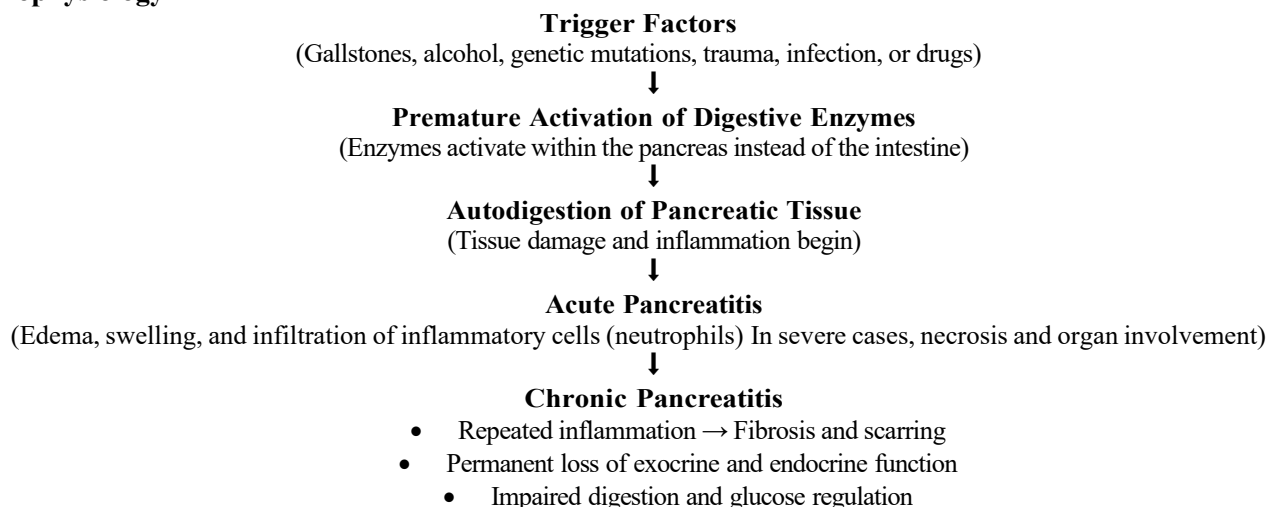
Feature	Acute Pancreatitis	Chronic Pancreatitis
Onset	Sudden and intense	Slow and recurring
Pain	Sharp, upper belly (epigastric region), spreads to back	Long-lasting, especially after eating
Enzyme levels	Very high (amylase/lipase)	Can be normal or slightly raised
Imaging findings	Swelling, fluid, necrosis	Calcification, duct blockages
Reversibility	Often reversible	Mostly irreversible
Complications	Organ failure, pseudocyst	Diabetes, malabsorption, pancreatic cancer
Main Causes	Gallstones, alcohol, infections	Long-term alcohol use, genetics

4. Causes of Pancreatitis

There are many triggers for pancreatitis, including:

- **Gallstones:** These can block the bile duct and cause enzymes to back up into the pancreas, triggering inflammation.^[3]
- **Alcohol abuse:** A major cause, especially in the West, as it directly causes oxidative stress and inflammation within the pancreas.^[6]
- **High triglyceride levels:** When triglycerides are extremely high (>1000 mg/dL), they can reduce blood flow and damage the pancreas.^[7]
- **Medications, infections, and trauma:** Certain drugs (like steroids), viral infections (like mumps), or physical injury can all trigger pancreatitis.^[8]
- **Genetic mutations:** In hereditary pancreatitis, genetic mutations such as PRSS1 and SPINK1 predispose individuals to recurrent pancreatitis episodes. These conditions often manifest in childhood or adolescence.^[9]

5. Pathophysiology



6. Signs and Symptoms

Symptom	Acute Pancreatitis	Chronic Pancreatitis
Pain	Sudden, severe upper belly pain	Long-term pain, especially after eating
Nausea/Vomiting	Very common	Sometimes present
Fever	Can occur	Usually absent
Greasy stools	Rare	Very common (due to poor digestion)
Weight loss	Not typical	Common
Diabetes	Rare	Frequent as damage builds up

7. Diagnosis

The following are the key steps involved in making the diagnosis of pancreatitis.

Step for Making Diagnosis	
History Taking	Pain pattern, alcohol/gallstone history, triggers
Physical Examination	Vital signs, abdominal tenderness, bruising signs (Cullen's)
Blood Tests	Amylase, lipase, LFTs, triglycerides, calcium, glucose
Ultrasound	Gallstones, swelling, bile duct issues
CT scan	Complications like necrosis or pseudocyst
MRCP	Visualize pancreatic & bile ducts non-invasively
ERCP	Diagnose and treat duct blockages (used selectively) [13]

8. Management

Medical Management

Acute Pancreatitis	Chronic Pancreatitis
Nothing by mouth: To rest the pancreas.	Stop alcohol & smoking: Most important step.
IV fluids & painkillers: To support recovery.	Pancreatic enzyme tablets: To help digestion.
Antibiotics: If infection is suspected. (Imipenem-Cilastatin, Meropenem, Ciprofloxacin, Metronidazole, Piperacillin-tazobactam)	Insulin: If diabetes develops.
Endoscopic Retrograde Cholangiopancreatography (ERCP): To remove gallstones if needed.	Pain relief: Managed with medications. Opioids (Morphine, Fentanyl, Tramadol) NSAIDs (Diclofenac, Ibuprofen) Acetaminophen (Paracetamol)

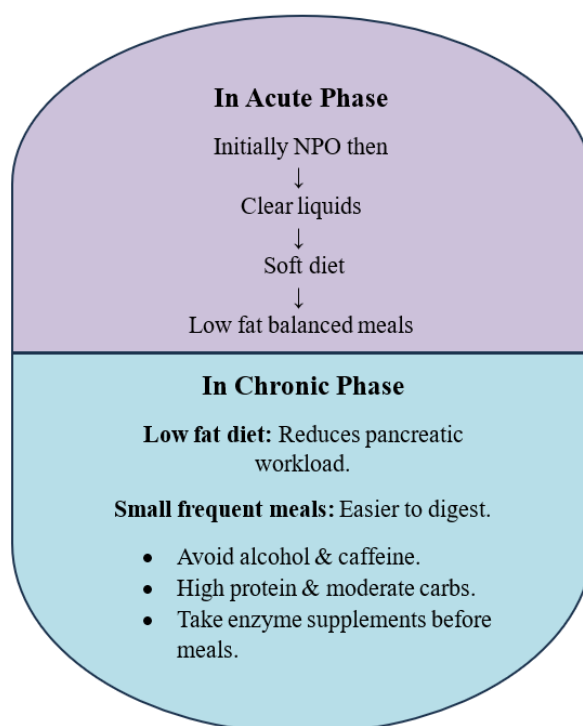
Surgical Management

1. **Cholecystectomy** – Removes gallbladder to prevent gallstone-induced pancreatitis.
2. **ERCP** – Clears bile/pancreatic duct blockages using an endoscope.
3. **Pancreatic Duct Drainage** – Relieves pressure in blocked ducts (e.g., Puestow procedure).
4. **Partial Pancreatectomy** – Removes damaged part of pancreas in chronic cases.
5. **Total Pancreatectomy** – Rare, for severe or genetic cases; requires lifelong insulin and enzymes

Nursing Management

- **Monitor vital signs** regularly.
- **Assess for pain** and give prescribed medication.
- **Keep NPO (nothing by mouth)** during acute attacks.
- **Hydration & electrolyte balance** via IV.
- **Monitor stools** for greasy or abnormal content.
- **Educate the patient:**
 - No alcohol or smoking.
 - Low-fat diet.
 - Take enzymes and insulin if prescribed.

Diet Plan



Recommended Foods	Not Recommended Foods
Boiled vegetables	Fried/fatty foods
Lean meats, eggs	Alcohol, caffeine
Whole grains, fruits	Red meat, cream, butter
Yogurt (low-fat)	Processed snacks

9. Possible Complications

Pancreatitis can cause several serious issues:

- **In Acute Cases:** Potential complications involve pancreatic necrosis, accumulation of fluid in the form of pseudocysts, development of fistulas, and multi-organ dysfunction.
- **In Chronic Cases:** It may lead to permanent digestive problems, diabetes, bile duct blockages, and a higher risk of pancreatic cancer.^[15]

10. Prevention

Steps to prevent pancreatitis focus on lifestyle and managing health conditions:

- **Avoid Alcohol:** Especially important in alcohol-induced cases.
- **Treat Gallstones and Lipid Disorders:** Removing gallstones and lowering triglyceride levels can reduce risk.
- **Genetic Counselling:** Helpful for families with hereditary pancreatitis to assess and reduce future risks.^[10]

11. Conclusion

Pancreatitis remains a major health concern. Early recognition, proper treatment, and managing the underlying causes are key to improving outcomes. Ongoing research into the genetic and molecular causes of pancreatitis is paving the way for better diagnosis and treatment options, including enzyme therapy and future gene-based treatments.

12. Source of Funding

None

13. Conflicts of Interest

No conflicts of interest

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