Pancreatitis, Chronic

Description/Etiology
Chronic pancreatitis (CP) is a progressive inflammation of the pancreas associated with irreversible damage to pancreatic structure and function that is not arrested by resolution of a precursor condition. This persistent, inflammatory autodigestive process causes severe abdominal pain, pancreatic exocrine and endocrine deficiency, scarring, and loss of function. As the disease progresses, patients can develop diabetes mellitus (DM) and might become malnourished because eating causes postprandial pain.

CP has a variety of predisposing factors, which can be recalled by the mnemonic TIGAR-O, as follows:
- Toxic-metabolic, due to chronic alcoholism
- Idiopathic
- Genetic (e.g., due to mutation of the cystic fibrosis transmembrane conductance regulator [CFTR] gene or the cationic trypsinogen gene, serine protease 1 [PRSS1], on chromosome 7)
- Autoimmune, due to inflammation and fibrosis following pancreatic lymphocyte infiltration
- Recurrent and severe acute pancreatitis (for more information on acute pancreatitis, see Quick Lesson About ... Pancreatitis, Acute)
- Obstructive, due to ductal drainage impairment by a tumor, congenital anomaly, blunt abdominal trauma, or inflammation

Diagnosis is challenging early in the disease process because functional and structural changes are minimal and symptoms are intermittent; CP often goes undetected until the patient seeks treatment for complications or reaches the advanced disease stage, when only 20% of the pancreas is viable. Patients are often symptomatic for years before a diagnosis is confirmed. Complications include malabsorption, steatorrhea, severe weight loss, and endocrine dysfunction that can lead to a form of DM termed “brittle” (a subjective term that refers to patients with DM who have dramatic, recurrent swings in glucose levels for no apparent reason; occurs more frequently in patients with DM, type 1). Other complications include ascites, bile duct stricture, pancreatic pseudocyst (i.e., an inflammatory mass in the abdomen) that can become infected, splenic vein thrombosis, gastric varices, peptic ulcer, osteoporosis, narcotic addiction, and pancreatic cancer.

CP is not typically curable and prognosis depends on the degree of loss of pancreatic function and the underlying cause. Supportive treatment from a multidisciplinary team of clinicians focuses on managing pain, resolving the underlying cause, enhancing nutrition, and correcting exocrine and endocrine insufficiency. Surgery (e.g., pancreaticojejunostomy [also called Roux-en-Y], total pancreatectomy with islet cell autotransplantation, or sphincterotomy) might be indicated to restore drainage of pancreatic secretions, manage pain, and treat complications. Alcohol avoidance and a healthy lifestyle are essential for pain relief.

Facts and Figures
The reported incidence of CP is 1.5–7.9:100,000 per year. The prevalence is 17–49:100,000. About 87,000 cases of CP occur in the United States annually. Worldwide, 1–4 million deaths per year are attributed to CP. The average age at diagnosis is 35–55 years. The
condition affects men five times as often as women. Chronic alcoholism accounts for 45–80% of cases and CP develops in 5–10% of heavy drinkers. Between 10% and 30% of cases are idiopathic and 1% are hereditary. More than 80% of adults with CP will develop DM within 25 years. Overall survival in patients with CP is 70% at 10 years and 45% at 25 years.

Risk Factors
The primary risk factor for CP is long-term alcohol abuse; risk increases directly with the amount of alcohol consumed and the duration of alcoholism. Other risk factors include certain genetic mutations (e.g., in the CFTR or PRSS1 genes), severe malnutrition, hypertriglyceridemia, hypercalcemia due to untreated hyperparathyroidism, autoimmune diseases (e.g., Sjögren’s syndrome, primary biliary cirrhosis, renal tubular acidosis), infections (e.g., HIV, mumps), use of certain medications (e.g., valproate, thiazide, estrogens), and cystic fibrosis

Smoking is a risk factor for both acute and chronic pancreatitis; current smokers are 2.5 times more likely to develop CP than never smokers

Acute pancreatitis can become chronic as a result of incomplete recovery and repeated relapse

Tropical CP is a form of idiopathic, early-onset CP associated with malnutrition that occurs in tropical Africa and Asia

Signs and Symptoms/Clinical Presentation
Pain, which is present in 85% of patients, usually precedes symptoms of exocrine and endocrine malfunction by several years. Early symptoms include intermittent epigastric or nonspecific abdominal pain that can radiate to the back, be relieved by leaning forward, occur after eating a large meal, and increase in severity following alcohol intake. Over time, abdominal pain can become persistent and most intense in the upper abdomen, and might worsen after eating or drinking any liquids. Weight loss, diarrhea, vomiting, anorexia, jaundice, flatulence, constipation, fatty or oily stools, pale or clay-colored stools, and epigastric tenderness might also be present.

Assessment

Laboratory Tests
• Glucose tolerance test (GTT) can show diminished pancreatic islet function
• Serum alkaline phosphatase, bilirubin, amylase, trypsinogen, and lipase levels can be elevated
• UA can show glycosuria; fecal fat content analysis can indicate steatorrhea
• Serum immunoglobulin G4 (IgG4) or gamma globulin levels might be elevated, indicating autoimmune CP
• Histologic analysis of biopsied tissue or fine needle aspiration of cystic lesions can differentiate CP by type and/or distinguish it from carcinoma

Other Diagnostic Tests/Studies
• Contrast-enhanced abdominal CT scan—the first-line imaging modality for initial CP assessment and frequently the only imaging study necessary for diagnosis—identifies anatomic changes in CP; calcifications are observed in ~ 30% of cases
• Endoscopic retrograde cholangiopancreatography (ERCP)—the preferred method for diagnosing and staging CP, which can also be used as a treatment modality—identifies anatomic changes in CP; the risk for serious complications should limit ERCP use to patients requiring anatomic definition unavailable from other imaging modalities or treatment for ampullary or ductal obstruction
• Abdominal ultrasound or endoscopic ultrasound (EUS) with fine needle aspiration provides biopsy and is used to monitor treatment efficacy in autoimmune CP

Treatment Goals
Provide Symptomatic Relief, Promote Nutrition, and Reduce Risk for Complications
• Frequently monitor vital signs and pain level; assess all physiologic systems (especially gastrointestinal) and metabolic status; review laboratory/diagnostic study results; verify that the treating clinician is aware of study results as they become available
• Assess for pain, which can be persistent or intermittent and can be so severe during acute attacks that opioid analgesics do not effectively provide relief; administer prescribed analgesic before meals, to reduce or prevent postprandial pain, or as otherwise prescribed
– Tricyclic antidepressants (e.g., amitriptyline) might be ordered to enhance the effects of analgesics
– Support the patient with pillows in a sitting-up, leaning-forward position to maximize comfort, if possible; request referral to a pain specialist, if appropriate
• Administer prescribed corticosteroids (e.g., prednisone) to patients with autoimmune CP; monitor treatment efficacy and for adverse effects (consult a drug information resource for adverse medication effects)
• Assess intake and output, and monitor for signs of dehydration or malnutrition (e.g., weight loss, vitamin/mineral deficiency)
  – Provide a low-fat, high-protein diet, as prescribed, with frequent, small meals; request referral to a registered dietitian for evaluation of dietary requirements and education about nutrition
  – Assess for nausea/vomiting; administer prescribed antiemetics and monitor effectiveness
  – Provide supplemental pancreatic enzymes (e.g., pancrelipase) with meals and administer proton pump inhibitors and/or H2 blockers, as prescribed, to reduce enzyme inactivation by gastric acid
  – Administer supplemental vitamins B12, A, D, E, K, folic acid, and calcium, as prescribed
  – Administer enteral/parenteral nutrition, as ordered, to improve nutritional status
• Monitor glucose levels and give prescribed oral hypoglycemic agents or insulin
• Follow facility pre- and post-surgical/procedure protocols if patient requires intervention for resolution of underlying cause, pain management, or complications
  – Reinforce pre- and post-surgical/procedure protocols and verify completion of facility informed consent documents

Promote Emotional Well-Being and Educate
• Assess the patient’s anxiety level, coping ability, and commitment to treatment regimen adherence; educate and encourage discussion about CP pathophysiology, potential complications, treatment risks and benefits, and DM self-management
• Request referral, if appropriate, to a mental health clinician for counseling on coping strategies and a social worker for identification of support groups and alcohol abuse treatment programs

Food for Thought
› Initial pain can be treated with nonsteroidal anti-inflammatory drugs (NSAIDs) or nonprescription analgesics; narcotic analgesics should be avoided as long as possible because addiction from use over long periods is almost unavoidable
› Alcohol-related CP results from the direct toxic effect of alcohol on pancreatic cells and alcohol-induced hypersecretion of protein that causes pancreatic duct obstruction
Following a review of published guidelines related to nutrition in acute and chronic pancreatitis issued during 1999–2011, the International Consensus Guideline Committee (ICGC) Pancreatitis Task Force issued the following statements based on strong evidence (Mirtallo et al., 2012):
  • Nutritional support therapy is usually not needed in patients with mild to moderate disease
  • Patients with severe disease require support in the form of enteral or parenteral nutrition
  • Enteral nutrition is preferred over parenteral nutrition
  • Parenteral nutrition should be used when enteral nutrition is not feasible
› Authors of a systematic review and meta-analysis of eight randomized trials including a total of 573 participants calculated that antioxidant supplementation is associated with a 2.2-fold increase in significant pain relief and a 44% decrease in need for analgesics in patients with CP (Zhou et al., 2015)
› Based on low- to moderate-quality evidence from one industry-funded trial with 64 participants, Cochrane reviewers concluded that short-term use of the pregabalin—a medication used to treat neuropathic pain, epilepsy, and generalized anxiety disorder—decreases short-term opiate use and short-term pain scores in patients with CP, but increases risk of adverse events compared to placebo (Gurusamy et al., 2016)

Red Flags
› ERCP increases the risk for an acute pancreatitis attack
› CP is a risk factor for pancreatic cancer, especially in patients who smoke; pancreatic cancer occurs in 4% of patients at 20 years after onset of CP
› DM management with diet and oral antidiabetic agents is desirable for as long as possible; insulin increases risk for life-threatening hypoglycemic reactions related to malabsorption, alcohol abuse, and irregular eating habits

What Do I Need to Tell the Patient/Patient’s Family?
› Educate regarding healthy lifestyle choices, including alcohol/tobacco abstinence; a well-balanced, low-fat, diabetic diet; and strict adherence to the CP treatment regimen
› Advise that routine medical surveillance is essential to reduce risk for complications; direct patient to seek immediate medical attention for new or worsening symptoms
Note

› Recent review of the literature has found no updated research evidence on this topic since previous publication on February 17, 2017

References