Problems of the GI System Accessory Organs

N123: Medical Surgical Nursing

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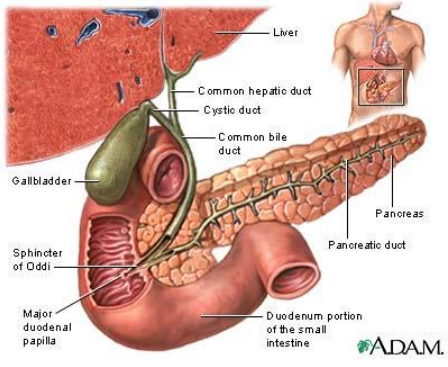
Objectives

Apply nursing process to care for individuals with biliary tract and pancreatic problems

- Discuss pathophysiology, manifestations, and complications of disease processes
- Review relevant diagnostic tests
- Formulate collaborative and independent nursing care plans
- Identify patient educational needs

Overview- Anatomy/Pathophysiology



Bile/Gallbladder Overview

Bile: liquid produced in liver

- Emulsifies fats (bile salts)
- Contains: water, cholesterol, fats, bile salts, proteins, bilirubin

Gallbladder: muscular sac located under liver

- Stores and concentrates bile
- Releases bile into small intestine in response to food

Gallstones - Review

- Hardened pieces of stone-like material
- Sizes from sand to golf ball
- Cholesterol stones – 85%, yellow-green, hardened cholesterol
- Pigment stones – small, dark, made of bilirubin

Cholelithiasis - Stones in the Gallbladder

Risk factors:

- Female
- Family hx
- Obesity
- ↑fat & cholesterol, ↓ fiber diet
- Rapid wt loss
- Age ≥ 60 yrs
- American Indians (Pima), Mexican Americans
- Cholesterol lowering drugs
- Diabetes

Cholelithiasis - Manifestations

May be asymptomatic – no treatment required (80%)

Movement of stones into neck or ducts:

- Biliary colic- gallbladder spasm, causing pain
  - Sudden excruciating pain
  - Lasting 30 min – several hours
  - RUQ, between shoulder blades, or under R shoulder
  - Tachycardia, diaphoresis, and prostration
  - Leaves residual pain/tenderness

Cholelithiasis - Complications

- Cholecystitis
- Choledocholelithiasis
- Cholangitis
- Gallstone pancreatitis

Cholelithiasis - Treatment

Laproscopic cholecystectomy:

- treatment of choice
- 2-5 % converted to open cholecystectomy

Stone dissolution:

- High surgical risk, decline surgery
- Most effective with small radiolucent stones
- Ursodeoxycholic acid (UDCA)– 80% effective small stones (helps prevent stones in obese pts)

Acute Cholecystitis

Inflammation of the gallbladder

- Most common complication of cholelithiasis
- D/t gallstone obstruction of cystic duct
- Bile stasis triggers release of inflammatory enzymes
- Develops over hours

Acute Acalculous Cholecystitis

Cholecystitis without stones

Risks factors: critical illness, prolonged fasting or TPN, shock, immune deficiency, vasculitis

Manifestations and complications similar to acute cholecystitis with gallstones

Cholecystitis - Manifestations

- Pain – more severe, lasts longer than biliary colic
- Right subcostal tenderness
- + Murphy's sign
- Involuntary right sided guarding
- Vomiting
- Leukocytosis
- Low grade fever – fever & chills
- Jaundice (CBD obstruction)

Cholecystitis - Complications

- Bacterial infection
- Gallbladder gangrene
- Perforation
  - 10% localized
  - 1% free and peritonitis
- Empyema
- Cholecystoenteric fistula, gallstone ileus

Cholecystitis - Treatment

- NPO
- Supportive care: hydration, opioid analgesics, antibiotics
- Nasogastric decompression (vomiting or ileus)
- Cholecystectomy
- Percutaneous cholecystostomy
- ERCP – biliary decompression

Diagnostic Tests (Biliary)

- Ultrasonography
  - 95% sensitivity and specificity
  - Accurately detects sludge
- Alternatives: CT, MRCP, HIDA (hydroxy iminodiacetic acid) scan, ERCP
- 10 – 15% gallstones visible on X-ray

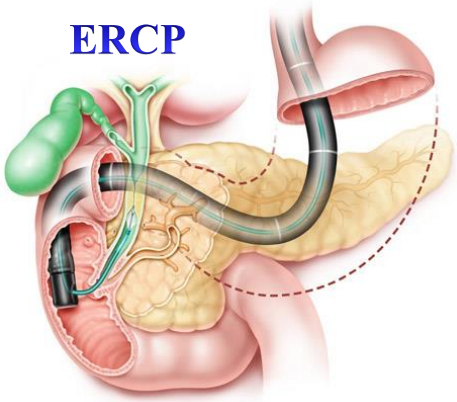
Diagnostic Tests-ERCP

Endoscopic Retrograde Cholangiopancreatography

- Allows visualization of gallstones and ducts
- Diagnosis: cancer, stones, infections, etc…
- Treatments:
  - Removal stones
  - Sphincterotomy
  - Dilatation

- Risks: sedation, pancreatitis, infection, perforation, bleeding

ERCP



Diagnostic Tests – Biliary (cont.)

- Labs: (indicative not decisive)
  - ↑WBC – infection
  - ↑direct and indirect bilirubin – biliary obstruction
  - ↑serum AST and ALT – biliary obstruction
  - ↑serum bilirubin – biliary tract disease
  - ↑serum alkaline phosphatase – obstructive jaundice
  - ↑serum amylase – perforation, peritonitis, biliary tract disease

Nursing Care/Education

Related to:

- Pain
- Medications (analgesics, NSAIDS, anticholinergics, fat-soluble vitamins, bile salts, UDCA)
- Pre-, post-procedures, surgery
- Potential complications
- Nutrition (low-fat diet)

Post-op Nursing Care

- Assess/prevent wound infection
- Pain management
- Prevent respiratory complications
- Assess BS
- Prevent thrombophlebitis
- Tube care:
  - NGT, JP, Penrose, T-tube

Patient Teaching: Post-op Laparoscopic Cholecystectomy

- Dressing can be removed day 1 post-op, pt can shower
- Report s/s infection, severe abd. pain, n/v
- Resume normal activities gradually
- Return to work w/in 1 week
- Diet: lo-fat 4-6 wks, advance as tolerated, avoid excessive fats

Pancreas - Overview

Pancreatic secretions flow into duodenum

- Endocrine- produces insulin, glucagon and somastatin
- Exocrine – secretes enzymes/juices in response to hormonal and vagal stimulation
  - Lipase, amylase, protease
  - Bicarbonate

Acute Pancreatitis

- Severe inflammation of the pancreas
  - Occurs suddenly
  - Resolves with treatment
  - Potentially life-threatening
- Results from enzymatic autodigestion

Acute Pancreatitis (cont.)
Causes: "I GET SMASHED"

- **I**diopathic
- **G**allstones
- **E**thanol-chronic heavy alcohol use
- **T**rauma- abdominal
- **S**teroids
- **M**umps
- **A**utoimmune
- **S**corpion sting
- **H**ypercalcemia, hypertriglyceridemia, hypothermia
- **E**RCP
- **D**rugs

Acute Pancreatitis -Manifestations

- Pain
- Tender swollen abdomen
- Nausea and vomiting
- Dehydration
- Fever
- Hypocalcemia
- Hypotension, tachycardia
- Dyspnea, hypoxia
- Bleeding leading to shock, hypovolemia
- Grey Turner's sign or Cullen's sign (rare)

Acute Pancreatitis - Complications

Early:

- Infection – secondary to pancreatic necrosis
- Renal, cardiac, and liver failure
- Pleural effusion, ARDS
- Encephalopathy

Late:

- Pseudocyst, organized necrosis, abscess, pancreatic fistula, and duodenal and bile duct stricture

Nursing/Collaborative Care

Acute Pancreatitis

- Assess respiratory status
- Pain management
- NPO
- Nasogastric suctioning
- Bedrest
- Fluid/electrolyte replacement
- Blood transfusions as required
- Insulin therapy
- Antibiotics
- TPN
- Intensive care support

Chronic Pancreatitis

- Continuous, prolonged, inflammatory and fibrosing process of the pancreas
- Worsens over time → permanent damage
- Digestive enzymes attack pancreas
- Acute can lead to chronic
- Associated w/ long-term, heavy alcohol use

Chronic Pancreatitis (cont.)

Causes

- Heavy alcohol use
- Hereditary disorders of the pancreas: cystic fibrosis
- Hypercalcemia
- Hyperlipidemia or hypertriglyceridemia
- Medications
- Autoimmune conditions
- Unknown causes

Chronic Pancreatitis - Manifestations

- Pain, some no pain
  - Upper abd., subcostal or umbilical, radiating to back
  - Increases with food, drink
  - May become constant, gnawing, disabling
  - Decreases as condition worsens
- Nausea/vomiting
- Wt loss
- Obstructive jaundice
- Diarrhea, steatorrhea
- Diabetes mellitus

Chronic Pancreatitis - Complications

- Pseudocyst
- Bile duct obstruction
- Pleural effusion
- Splenic vein thrombosis
- Pancreatic cancer

Pancreatitis - Diagnostic Tests

- Labs:
  - ↑serum amylase and lipase (acute pancreatitis)
  - possible↑ serum bilirubin, alkaline phosphatase, sed. rate, and mild leukocytosis
  - Fecal fat, fecal chymotrypsin (chronic)
- Ultrasound, CT scan, MRI, MRCP, ERCP
- Secretin stimulation test

Chronic Pancreatitis - Collaborative Care

- IV fluids
- Pain management
- Low-fat, hi-carb, bland diet
- Enzyme supplements
- Surgery – remove part of pancreas

Pancreatitis - Patient Education

Goal: prevent future acute attacks and progression of pancreatitis

- No alcohol (cessation programs)
- Nutrition:
  - Necessity of NPO during acute phase
  - Small meals
  - Low-fat, high-carb bland diet
- S/S infection, DM, steatorrhea
- Pancreatic enzyme replacement
  - Prevent malnutrition and weight loss

Questions?

Additonal References:

- Medscape REFERENCE: Drugs Diseases & Procedures http://emedicine.medscape.com
- Digestive Diseases: Medline Plus http://www.nlm.nih.gov/medlineplus/digestivediseases.html