CCRN/PCCN GI Review

Department of Critical Care Nursing
The Ohio State University Wexner Medical Center

Test Plan: GI

- PCCN – 5% GI hemorrhage
  - PCCN – infections
  - PCCN – motility disorders
  - PCCN – Hepatic failure
  - PCCN – Malnutrition
  - PCCN – Pancreatitis

- CCRN – 6% = 7 questions
  - Acute Abdominal Trauma
  - Acute GI hemorrhage
  - Bowel infarction/obstruction
  - GI surgeries
  - Hepatic failure/coma
  - Malnutrition/malabsorption
  - Pancreatitis

Gastrointestinal System

- Mouth
- Stomach
- Small intestine
- Large intestine
- Rectum
- Anus

- Accessory Organs
  - Liver
  - Gallbladder
  - Pancreas

Pancreatitis

- Causes
  - ETOH
  - Obstruction of ducts
  - Pancreatic ducts/acini
  - Gallbladder disease or Infection
  - Drug Toxicity
  - Steroids, Thiazides, tetracycline
  - Trauma

- Signs and Symptoms
  - Hypocalcemia
  - HHNK
  - Left pleural effusion
  - Left pleural atelectasis
  - Bilateral rales
  - Die of ARDS
  - Cullins sign
  - Gray Turners sign

Diagnosis

- Elevated serum amylase
- Lipase, LDH, AST, WBC’s, Glucose, BUN triglycerides
- CBC—HCT > 47% indicative of severe necrotizing pancreatitis
- ABG’s ARD or diaphragmatic irritation.
- CXR—pleural effusion, diaphragm, atelectasis
- CT, MRI
- ERCP contraindicated in acute phase
# Treatment

- Airway-O2
- Fluid and electrolyte management
- NPO, mouth care, NG stomach decompression
- Pain Control MS vs Demerol
- Treat nausea
- TPN vs NJ parenteral feedings

# Prognosis

- Good when pancreatitis is associated with biliary tract disease
- Poor when associated with ETOH
- Mortality is as high as 60% when process is associated with necrosis and hemorrhage

# Liver

- Detoxifies Blood—
- Kupffer cells (Phagocytes for old RBC's)
- Liver makes (hepatocytes)
  - Bile
  - Synthesizes amino acids
  - Albumin
  - Fibrin
  - Prothrombin
  - Converts glucose to Glycogen-- Gluconeogenesis
  - Converts glycogen to glucose-- Glycogenolysis
  - Converts ammonia into urea
  - Stores Vit (A,D,E,K,B12) cooper, iron

# Hepatic Failure

- Chronic – parenchymal cells are progressively destroyed and replaced with fibrotic tissue (75% of liver can be destroyed before symptoms appear)
- Fulminant Hepatic Failure – liver cells fail to regenerate and necrosis occurs

# Etiology

- Acute
  - Viruses (hepatitis, herpes simplex, CMV)
  - Hepatotoxic drugs
  - Ischemia
  - Trauma
  - Reye's syndrome
  - Acute fatty liver of pregnancy
- Chronic
  - Cirrhosis
    - ETOH
    - Biliary
    - Postnecrotic
    - Metabolic
- Primary or metastatic tumors of the liver

# Receives 1500 ml of blood per minute

- GI system venous return goes through the liver
- Esophagus (esophageal varices)
- Spleen (splenomegaly)
- Stomach (gastritis)
- Intestines (hemorrhoids)
Beware of these in Liver disease

- $\downarrow K = \uparrow$ ammonia
  - Use K sparing diuretics, spiralactone
- $\uparrow$BUN = $\uparrow$ ammonia
- $\uparrow$Proteins = $\uparrow$ammonia
- $\uparrow$Acid (metabolic acidosis)
  - (Ringers Lactate)
- All create hepatic encephalopathy

LR in the presence of Alkalosis

- Alkalosis or hypothermia
- Blood vessels vasoconstrict
- Creates a shift to left on the oxyhemoglobin dissociation curve
- Red cells will hang on to oxygen, don’t release to the tissue

Complication of Neomycin Therapy

- Vitamin Deficiency
- Not absorbed systemically
- Bowels make Vitamins (riboflavin, folic acid, synthesis Vit K) which releases ammonia

Liver Failure VS Gall bladder disease

- Bilirubin (breakdown of hemoglobin) and albumin travel around and are indirect or unconjugated
  - They are in a fat soluble formation
- In the liver they become direct or conjugated
  - They are then a water soluble formation
- Move to gall bladder, stored and then excreted as bile though the kidneys and intestine

Management of Hepatic Failure

- Identify and treat cause
- Monitor and maintain fluid and lyte status
- Encephalopathy
  - lactulose
- Ascites
  - Support breathing, low Na diet, diuretic (lasix vs spiro)
- Esophageal varies
  - Stabilize (octreotide), balloon tamponade, endoscopy, TIPS
- Cautious drug administration
- Monitor / maintain nutrition
- Monitor glucose metabolism

Abdominal Trauma

- Spleen most commonly injured abdominal organ
- Kehr’s sign— pain in left shoulder
Etiology GI Hemorrhage

- Peptic ulcer disease
- Helicobacter pylori
- Genetic
- Smoking
- Diet
- Drugs

Presentation/Diagnosis

- Fatigue, weakness decreased H/H
- Thirst
- Anxity
- Blood/coffee ground emesis
- Black stools
- S & SX of acute abdomen

Management

- ABC’s
- Restore circulating blood volume
- Control bleeding
- NG tube
- EGD
- OR

Upper GI Bleeds

- Occurring from the esophagus, stomach, or duodenum
- Esophageal Varices, Sengstaken-Blakemore tube, TIPS
- Mallory-Weiss tear
- Gastritis
- Cancer

Lower GI Bleeds

- Occurs below the ligament of Treitz, jejunum, colon or rectum
- Caused by
  - Polyps
  - Inflammatory disease
  - Diverticulitis
  - Cancer
  - Vascular ectasias (Angiodysplasias)
  - Hemorrhoids

Other lower GI issues

- Infarctions
  - Occlusive (mesenteric artery flow)
  - Non occlusive (mesenteric insufficiency, chronic)
- Obstruction
  - Large bowel = large distention
  - Nothing coming up or out
  - Long duration pain
  - Small bowel = small distention
  - Diarrhea and vomiting
  - Short sharp pain
- Trauma
  - Open, peritonitis, bleeding
  - Closed, spleen, kidneys, duodenum, liver
**Nutrition**

- Normal caloric requirements:
  - At rest = 25kcal/kg/day
  - Normal activity = 35kcal/kg/day
  - Critically ill = 25kcal/kg/day
  - Temperature elevates needs by up to 10% / degree C°
  - Protein requirements ~ 1g/kg/day

**Nutrition**

- Goal to maintain Fluid and Electrolyte balances
  - Labs indicating malnutrition:
    - Albumin levels < 2.5g/dl
    - Lymphocytes < 1000mm³
  - Interventions:
    - Enteral feedings = 1kcal/ml
    - Parental infusions = give higher levels of calories

**Nutrition**

- Complications from:
  - Enteral Feeds:
    - Diarrhea
    - Dehydration
    - Nausea/Vomiting
    - Increased Glucose levels
  - Parental Feeds:
    - Infection
    - Thrombosis
    - Hyperosmolar nonketotic hyperglycemia
    - Electrolyte disturbances

**Nutrition**

- Complications of Malnutrition:
  - Loss of weight/fat
  - Progressive muscle wasting
  - Impairment of muscle function
    - Respiratory function
  - Immunodeficiency
  - Poor wound healing
  - Increased prevalence of pressure ulcers
  - Decreased mobility

**References**
