Short Bowel Syndrome and Parenteral Nutrition

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Sodexo Mid-Atlantic Dietetic Internship
January 28, 2014
Objectives

- To define short bowel syndrome
- To identify key information needed when assessing a patient with short bowel syndrome
- To understand nutrition interventions used for patients with short bowel syndrome
Short Bowel Syndrome

- "Short bowel syndrome results from surgical resection, congenital defect, or disease-associated loss of absorption and is characterized by the inability to maintain protein, energy, electrolyte, or micronutrient balances when on a conventionally accepted, normal diet (8)."

- <100 cm of small intestine without a colon or <50 cm of small intestine with a colon
Steps to evaluating a patient with Short Bowel Syndrome

- Etiology
- Medical and Surgical history
- Define remaining anatomy
- Determine I/O
- Medications
- Parenteral/enteral
- Diet
Patient Overview

- F.F. is a 77 y.o. Caucasian female
- Suffered from Short Bowel Syndrome for over 14 years
- Admitted for nausea, vomiting, abdominal pain
- Referral: RN screen for poor appetite >5 days
Etiology of F.F.’s Short Bowel Syndrome

- Chronic constipation
- Colonic dysmotility
Past Medical History

- Short bowel syndrome on home parenteral nutrition
- Gastroesophageal reflux disease
- Osteopenia
- Gastritis
- Pancreatitis
- Multiple small bowel obstructions
- Colon polyps
- Chronic pain
- Vitamin B12 deficiency
- Prerenal azotemia
Past Surgical History

- **2000**
  - (1) Colectomy & ileorectal anastomosis
  - (2) Anastomotic leak
    - Repair unsuccessful, resulting in a temporary ileostomy

- **2001**
  - (3) Attempt to repair ileorectal leak
    - Resection of 6 inches of ileum and rectum; functioning ileorectum
    - Distal temporary jejunostomy
      - Majority of output

- **2002**
  - (4) Reversal of jejunostomy
    - Functioning jeno-ileo-anastomosis & ileorectal anastomosis

- **2011**
  - (5) Resection of necrotic ileum & jejunum, takedown of ileorectal anastomosis, construction of jejunostomy

- **2012**
  - (6) Stoma was repositioned
Home Medications

- **Phenergen**: chronic nausea
- **Protonix**: acid reducing agent
- **Pepcid**: anti-secretory agent
- **Dilaudid**: pain management
- **Calcitron**: vitamin supplement
- **Hyoscyamine**: anti-motility agent, acid reducing agent
- **Creon**: pancreatic enzyme
- **Gattex**: GLP-2 analog (absorption, anti-motility, anti-secretory)
Gattex (Teduglutide)

- Indication
- GLP-2 Analog
- Side Effects
- Post market study required by FDA
Initial Nutrition Assessment (Day 1)

- Subjective information:
  - Nausea, vomiting & abdominal pain for over 1 week
  - Started Gattex 2 weeks ago
  - Missed 3-4 days of PN last cycle, but had PN for the last 2 nights
  - Output ~ 5-6 liters/day from jejunostomy
Initial Nutrition Assessment

- Current Diet: low fiber
- No parenteral nutrition order

Diet prior to admission:
- Bland, low fiber
- Chicken noodle soup + rice
- Juice and broth

Parenteral nutrition: 5 days/week
Initial Nutrition Assessment

- Anthropometrics
  - Wt: 59 kg (#130)
  - Ht: 65"
  - BMI: 21.65 ~ underweight for age > 65

- Energy:
  - 25-30 kcal/kg
  - 1500-1800 kcal/day

- Protein:
  - 1.1-1.3 gm/kg
  - 65-75 gm/day

- Fluid:
  - 30-40 ml/kg
  - 1800- 2400 ml/day
# Laboratory Data (Day 1)

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Nutrition Diagnosis

- Inadequate parenteral nutrition related to inability to meet calorie/protein needs as evidenced by parenteral nutrition not ordered
Nutrition Intervention

- At this time, patient remained on “observation”
- Plan to discharge home the next day (1/3)

- RD recommendation:
  - Continue low fiber diet
  - Pancreatic enzymes
  - Initiation of parenteral nutrition
Consult to start CPN (Day 3)

- Discussed home CPN order with patient
- Home infusion company called to verify regimen

- Vomited 6x overnight

- Laboratory Data
  - BUN: 61
CPN Order (Day 3)

- Type: CPN
- Access: PICC single lumen catheter
- Concentration: 2400 ml over 10 hours (127.75 ml, 255.5 ml)
- Macronutrients:
  - Dextrose: 300 gm
  - Amino Acids: 100 gm
  - Lipids: 250 mL 20% (MWF)
- Electrolytes: custom (120 mEq NaCl, 60 mEq Na acetate, 26.5 mEq KCl, 9 mEq Mg, 16 mmol KP04)
- Provision:
  - 1634 kcal/day (includes lipids ~ 1500 kcal/week or 214 kcal/day)
- Glucose infusion rate: 3.5 mg/kg/min
- Additional calorie source: low fiber diet
Follow Up (Day 5)

- Subjective:
  - Very nauseous
  - Unable to eat anything by mouth

- Newly noted orders: Phosphate, Magnesium & Potassium Protocol

- No documentation of output
## Follow Up (Day 5)

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Follow Up (Day 5)

- Changes made to parenteral nutrition order:
  - Glucose: 325 grams
  - Amino acids: 70 grams
  - Total calories = 1600 kcal

- Replete potassium & phosphorus per protocol

- Recommend IV calcium gluconate
Nutrition Follow Up (Day 6)

- Complaints of nausea, no emesis
- Unable to consume anything by mouth
- Newly noted medications: IV calcium gluconate & salt tablets
- Esophagogastroduodenoscopy (EGD)- gastritis and esophagitis
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Nutrition Diagnosis (Day 6)

- Altered GI function related to extensive intestinal resection as evidenced by inability to maintain hydration.

- Altered nutrition related lab values related to suspected dehydration as evidenced by abnormal BUN, high output from jejunostomy
Follow Up (Day 6)

- Discussed importance of strict I/O with RN/PCT

- Continue low fiber diet

- Changes made to CPN order:
  - 2800 ml over 14 hours
  - 170 mEq NaCl
# CPN Monitoring (Day 7)

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CPN Monitoring (Day 7)

- Output from jejunostomy = 1800 ml
- Changes made to CPN order:
  - 230 mEq NaCl
  - Omit lipid administration 1/8; lipids given incorrectly 1/7
## CPN monitoring (Day 8-9)

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Follow up (Day 10)

- Gastric Emptying Test
  - 20% of food was digested in 90 minutes
  - Results: delayed gastric emptying
Follow Up (Day 10)

- Nausea improving
- Intake: 50-75% of meals
- Newly noted medications: Reglan

Laboratory Data:
- BUN: 30
- PO4: 2.3

Output from jejunostomy ~ 2450 ml (24 hrs)
Follow up (Day 13)

- Current diet order: low fiber, intake = 50% of meals
- Newly noted medications: Questran
- Laboratory Data:
  - CMP was unremarkable

- Education:
  - Oral Rehydration Solutions
  - Resources
Oral Rehydration Solutions (ORS)

- Isotonic solutions
- Perfect combination between salt, sugar and water
  - 20-25 grams of carbohydrates, 1750-1850 milligrams of sodium in 1 liter of water
- Examples are Pedialyte, Rehydralyte and CeraLyte
- Homemade solutions
- Benefits
Recipes for ORS

- Homemade ORS with Orange Juice
  - ½ tsp. salt
  - ½ tsp. baking soda
  - 8 tsp. sugar
  - 1 cup unsweetened orange juice with pulp
  - 1 liter of water

- Gatorade Base
  - 2 cups Gatorade
  - 2 cups water
  - ½ tsp. salt

- Contains approximately 90 mEq Na, 13 mEq K, 20 gm glucose
Discharge Summary

- Patient was discharged to a rehabilitation facility
- Nausea was likely secondary to gastroparesis
- Gattex
Additional Resources

- http://www.shortbowelsupport.com/default.htm
  ** Patient Guide to Short Bowel Syndrome

- http://www.shortbowelfoundation.org/

- http://www.oley.org/
References


References cont.


Questions??