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Case #9: Gastroesophageal Reflux Disease

Case Questions

I. Understanding the Disease and Pathophysiology

1. How is acid produced and controlled within the gastrointestinal tract?
 - Hydrochloric acid (HCl) is released from parietal cells in the stomach lining in response to histamine, gastrin, and acetyl choline (ACh). Somatostatin inhibits histamine, and thus secretion of HCl when pH falls.
 - HCl is secreted during the cephalic and gastric phases of digestion. During the intestinal phase, HCl secretion slows.
 - The stimulation of gastric juices can result from the presence of protein, distention of the stomach, caffeine, and alcohol.
2. What role does lower esophageal sphincter (LES) pressure play in the etiology of gastroesophageal reflux disease? What factors affect LES pressure?
 - LES incompetence is a common cause of GERD. A lower LES pressure can allow the reflux of gastric contents.
 - LES pressure can be lowered as a result of increased secretion of gastrin, estrogen, or progesterone; medical conditions, such as a hiatal hernia or scleroderma; cigarette smoking; use of dopamine, morphine, and theophylline; and presence of foods high in fat, chocolate, spearmint, peppermint, alcohol, and caffeine.
3. What are the complications of gastroesophageal reflux disease?
 - Some symptoms of GERD include dysphagia, heartburn, increased salivation, belching, and pain in the back, neck, or jaw. If untreated, GERD can result in impaired swallowing, aspiration of gastric contents into the lungs, ulceration and perforation of esophagus. The most severe result of GERD is Barrett's Esophagus.
4. What is *H. pylori*, and why did the physician want to biopsy the patient for *H. pylori*?
 - *Helicobacter pylori* (*H. pylori*) is a bacteria that can infect the stomach and lead to gastritis.
 - The physician wants to biopsy Mr. Nelson to determine whether or not this infection is the cause of his symptoms.
5. Identify the patient's signs and symptoms that could suggest the diagnosis of gastroesophageal reflux disease.
 - Heart burn, indigestion, sensitivity to fried foods.
6. Describe the diagnostic test performed for this patient.
 - Barium esophagram is an x-ray of the esophagus after the pt. swallows barium. The x-ray can show ulcers and strictures that may be present with GERD.
 - pH monitoring records the pH of the esophagus in order to determine whether or not stomach contents are refluxing into the esophagus. The data is collected

using a catheter that is inserted through the pts. nose and placed just above the LES.

7. What risk factors does the patient present with that might contribute to his diagnosis? (Be sure to consider, lifestyle, medical, and nutritional factors.)
 - Chronic use of aspirin and ibuprofen.
 - Diet high in fat.
 - Alcohol consumption.
 - Decreased physical activity.
8. The MD has decreased this patient's dose of daily aspirin and recommended discontinuing his ibuprofen. Why? How do aspirin and NSAIDs affect gastroesophageal disease?
 - Ibuprofen and aspirin are both non-steroidal antiinflammatory drugs (NSAID) that can result in a decrease in mucosal lining leading to gastritis or peptic ulcer disease. NSAIDs can increase symptoms associated with GERD due to their impact on the mucosal lining of the stomach.
9. The MD has prescribed lansoprazole. What class of medication is this? What is the basic mechanism of the drug? What other drugs are available in this class? What other groups of medications are used to treat GERD?
 - Lansoprazole is a proton pump inhibitor (PPI) used to treat GERD. PPIs decrease the production of acid in the stomach, thus relieving symptoms associated with GERD.
 - In addition to lansoprazole (Prevacid), omeprazole (Prilosec), pantoprazole (Protonix), rabeprazole (Aciphex), and esomeprazole (Nexium) are other PPI drugs available by Rx.
 - Other groups of medications used to treat GERD include antacids, foaming agents, H₂ blockers, and prokinetics.

II. Understanding the Nutrition Therapy

10. Are there specific foods that may contribute to GERD? Why or why not?
 - Foods high in fat, chocolate, spearmint, peppermint, alcohol, and caffeine can result in GERD symptoms. These foods cause symptoms by lowering LES pressure and/or relaxing the LES.
11. Summarize the current recommendations for nutrition therapy in GERD.
 - Decrease gastric acidity by avoiding black/red pepper, coffee, alcohol, and the consumption of large quantities of food in a single sitting.
 - Avoid foods that lower LES pressure, such as chocolate, mint, and high fat foods.

III. Nutrition Assessment

A. Evaluation of Weight/Body Composition

12. Calculate this patient's percent UBW and BMI. What does this assessment of weight tell you? In what ways does this contribute to his diagnosis?
 - ht. = 5'9" = 1.75 m
 - wt. = 215 lbs. = 98 kg
 - UBW = 160
 - % UBW = 130%
 - BMI = 32; pt. is class I obese

- “Obesity satisfies several criteria for a causal association with GERD and some of its complications.” (<http://www.ncbi.nlm.nih.gov/pubmed/18651221>)

B. Calculation of Nutrient Requirements

13. Calculate energy and protein requirements for Mr. Nelson. Identify the formula/calculation method you used, and explain the rationale for using it.
- Mifflin-St. Jeor: $1839 \times 1.6 = 2942$
 - Harris Benedict: $1964 \times 1.6 = 3124$
 - Quick Estimate: $2352 \times 1.6 = 3764$
 - Average EER = 3277
 - To find an average EER, I compiled the results from three resting energy expenditure calculations and used a PAL of 1.6 because Mr. Nelson’s job is seated with some movement.

C. Intake Domain

14. Complete a computerized nutrient analysis for the patient’s usual intake and 24-hour recall. How does his caloric intake compare to your calculated requirements?
- An analysis of pts. usual intake suggests about 3200 kcal per day with macronutrients within AMDR. Pts. intake is adequate for weight maintenance, but not for weight loss.
 - Nutrients of concern include vitamin D, for which pt. met 34% of the RDA, and vitamin E, for which pt. met 52% of the RDA.
15. From the information gathered within the intake domain, list possible nutrition problems using the diagnostic term.
- Class I obesity RT excessive calorie intake AEB BMI and % UBW.
 - Inadequate intake of vitamins D and E RT inadequate selection of dairy and vegetable oil AEB diet Hx.

D. Clinical Domain

16. Are there any other abnormal labs that should be addressed to improve Mr. Nelson’s overall cardiac health? Explain.
- Mr. Nelson’s TCHOL is “borderline-high” at 220 mg/dL with high LDL and low HDL cholesterol levels. These labs suggest that pt. is at high risk for CVD.
17. From the information gathered within the clinical domain, list possible nutrition problems using the diagnostic term.
- Elevated serum TCHOL, LDL, and inadequate HDL RT selection of foods high in saturated and trans fats AEB blood test.

E. Behavioral-Environmental Domain

18. What other components of lifestyle modification would you address in order to help in treating his disorder?
- Physical activity habits are important for weight loss and cardiovascular health.
 - Dietary habits, such as food selection, eating schedule, and portion control are important for weight management and control of symptoms associated with GERD.

19. From the information gathered within the behavior-environmental domain, list possible nutrition problems using the diagnostic term.

- Class I obesity RT inadequate PA resulting from knee surgery and shoulder injury AEB pt. self-report.

IV. Nutrition Diagnosis

20. Select two high-priority nutrition problems and complete the PES statement for each.

- Class I obesity RT excessive calorie intake and inadequate PA resulting from knee surgery and shoulder injury AEB BMI and % UBW.
- Elevated serum TCHOL, LDL, and inadequate HDL RT selection of foods high in saturated and trans fats AEB blood test.

V. Nutrition Intervention

21. For each of the PES statements that you have written, establish an ideal goal (based on the signs and symptoms) and an appropriate intervention (based on the etiology).

- Weight loss of one pound per week until goal weight of 80 kg (175 lbs.) is reached to be achieved by 2.5 hours PA/wk and a daily consumption of 2700 kcal.
- Reduction of total cholesterol to below 200 mg/dL, LDL to below 130 mg/dL and increase of HDL to above 40 mg/dL through TLC diet, prescribing <7% kcal from saturated fat, < 200 mg cholesterol per day, 10-25 g. soluble fiber, and 2 g. plant sterols.

22. Outline necessary modifications for him within his 24-hour recall that you could use as a teaching tool.

Food Item	Modification	Rationale
Crispix	cheerios	increase fiber
Skim milk	n/a	
Orange juice	n/a	
Diet Pepsi	skim milk	increase Ca
Fried chicken sandwich	broiled chicken on whole wheat	increase fiber and decrease fat
French fries	baked potato w/ benecol	decrease fat, increase plant sterols
Iced tea	n/a	
Chips	pretzels	decrease fat
Beer	water	decrease kcal
Fried chicken	broiled salmon	decrease sat. fat; increase omega-3 FA
Potato salad	brown rice w/ benecol	increase fiber, decrease fat, increase plant sterols
Green bean casserole	steamed green beans w/ benecol	decrease fat/kcal; increase plant sterols

Fruit salad	n/a	
Baked beans	black beans	decrease kcal
Milkshake	sherbet	decrease fat/kcal

Nelms, M., Sucher, K., & Long, S. (2007) *Nutrition Therapy and Pathophysiology*. Belmont, CA: Wadsworth.