Case Study Questions

I. Understanding the disease and Pathophysiology

1. The small bowel biopsy results state, “flat mucosa with villus atrophy and hyperplastic crypts- inflammatory infiltrate in lamina propria.” what do these results tell you about the change in the anatomy of the small intestine? 
   Celiac Disease causes the flattening of the small intestine villi and hyperplastic crypts compensate for atrophy of villi

2. What is the etiology of celiac disease? Is anything in Mrs. Gaines’s history typical of patients with celiac disease? Explain. 
   The etiology of Celiac disease is unknown but it is found to be genetic and autoimmune.

3. How is celiac disease related to the damage to the small intestine that the endoscopy and biopsy results indicate? 
   Celiac disease is related to the damage of the small intestine because the autoimmune response to gluten and the immune reaction damages villi.

4. What are AGA and EMA antibodies? Explain the connection between the presence of antibodies and the etiology of celiac disease. 
   AGA, the antibody reaction to gliadin, and EMA, the reaction to ongoing damage of the intestinal lining, are the antibodies that fight against gluten.

5. What is a 72-hour fecal fat test? What are the normal results for this test? 
   The 72 hour fecal fat test tests for steatorrhea and the normal results for this test are stool containing less than 7g of fat per 24 hours.

6. Mrs. Gaines’s laboratory report shows that her fecal fat was 11.5 g fat/24 hours. What does this mean? 
   Ms. Gaines’ fecal fat test results of 11.5 grams fat/24 hours show positive results for steatorrhea, which means she has fat malabsorption

7. Why was the patient placed on a 100-g fat diet history indicates that her symptoms are much worse with fried foods? 
   The 100 g. fat diet that the patient was placed on was a temporary fecal fat tests to observe her fat absorption rates and determine if she has steatorrhea.

II. Understanding the Nutrition Therapy
8. Gluten Restriction is the major component of the medical nutrition therapy for celiac disease. What is gluten? Where is it found?
Gluten is a mixture of two proteins: gliadin and glutenins. It is found in wheat grains, is not water soluble, and gives dough its elastic texture.

9. Can patients on a gluten-free diet tolerate oats?
Although naturally oats are gluten free, patients with celiac need to be careful them. It is very common during processing for oats and oat products to get contaminated with or exposed to gluten. Gluten free oats are available at some grocery stores.

10. What sources other than foods might introduce gluten to the patient?
Shampoo, sunscreen, pet food, medicine, vitamins, beauty products, artificial food colorings, envelopes/stamps, Toasters and pots/pan, grills

11. Can patients with celiac disease also be lactose intolerant?
Yes, patients with celiac disease can also be lactose intolerant.

III. Nutrition Assessment
   A. Evaluation of Weight/Body Composition
      12. Calculate this patient’s percent UBW and BMI, and explain the nutritional risk associated with each value.
      UBW: 82% = moderate weight loss
      BMI: 16.3 = underweight

   B. Calculation of Nutrient Requirements
      13. Calculate this patient’s total energy and protein needs using the Harris-Benedict equation or Mifflin-St. Jeor equation.
      Energy needs: 1175 * 1.2 (for metabolic stress) = 1410 kcal
      Protein needs: 62.7 g protein

   C. Intake Domain
      14. Evaluate Mrs. Gaine’s 24-hour Recall for adequacy.
      Ms. Gaine’s 24-hour recall shows that her current diet is inadequately providing necessary nutrients. She is consuming a very small amount of calories consisting of bland items such as a slice of toast with butter for breakfast, and not including any fruits, vegetables, dairy, or protein foods. For lunch she eats chicken soup, saltine crackers, and applesauce. These food items also do not provide the necessary amount of nutrients. She appears to be eating foods that are commonly known to soothe an upset stomach, but for her condition of celiac disease, most these foods contain gluten, which
will only make her symptoms worse, therefore causing her to eat less.

15. **From the information gathered within the intake domain, list possible nutrition problems using the diagnostic term.**
   Inadequate Energy Intake, Inadequate fluid intake, in adequate oral intake, increased Nutrient needs, Inadequate overall Vitamin and mineral Intake.

D. **Clinical Domain**

16. **Evaluate Mrs. Gaines’s laboratory measures for nutritional significance. Identify all laboratory values that support a nutrition problem.**
   She is low in albumin, total protein, prealbumin, magnesium and osmolality. She is on the

17. **Are the abnormalities identified in question 16 related to the consequences of celiac disease? Explain.**
   The positive results for the presence of AGA and EMA antibodies show that the body is having an immune reaction to gluten. The level of 11.5 from the fecal fat test shows that her body is malabsorbing fat. This malabsorption and the malabsorption of her many vitamins and nutrients is due to her inability to eat because of pain as well as her intestine not absorbing because the celiac disease is causing it to atrophy.

18. **Are any symptoms from Mrs. Gaines’s physical examination consistent with her laboratory values? Explain.**
   Due to Ms. Gaines’s lack of consumption and absorption essential nutrients, she has become underweight, pale, and fatigued. She is experiencing weakness and diarrhea which could be caused by her steatorrhea. The steatorrhea and diarrhea contribute to malabsorption of nutrients and dehydration.

19. **Evaluate Mrs. Gaines’s other anthropometric measurements. Using the available data, Calculate her arm muscle area. Interpret this information for nutritional significance**

20. **From the information gathered within the clinical domain, list possible nutrition problems using the diagnostic term.**
    Altered GI Function, Untintended Weight loss, Underweight, poor nutrition quality of life, impaired nutrient utilization, altered nutrition related lab values
IV. Nutrition Diagnosis

21. Using the VA Nutrition Screening Form, what is this patient’s nutrition status level? (Please attach your screening form to the back of your case study)
   The patient’s nutrition status level is a 3.

22. Select two high-priority nutrition problems and complete the PES statement for each.
   PES-1: Food and nutrition related knowledge deficit (NB-1.1) related to new diagnosis of Celiac Disease as evidenced by never having Celiac Disease before.
   PES-2: Impaired nutrient utilization related to gastrointestinal tract malabsorption and atrophy as evidenced by fecal fat result of 11.5 and low lab values.

V. Nutrition Intervention

23. For each of the PES statements that you have written, establish an ideal goal and an appropriate intervention.
   Goal: Patient is educated on gluten-free diet that meets requirements of Celiac Disease.
   Intervention: Purpose of the nutrition education(E-1.1), priority modifications (E-1.2), nutrition relationship to health/disease (E-1.4).
   Goal: Patient’s GI tract is healed of all atrophy and symptoms subside.
   Intervention: modify distribution, type, or amount of food and nutrients within meals or at specified time. (ND-1.2)

24. What type of diet would you initially begin when you consider the potential intestinal damage that Mrs. Gaines has?
   I would recommend a GI soft gluten free, low fat, and lactose free diet initially until she can tolerate a more regular diet.

25. Mrs. Gaines’s nutritional status is so compromised that she might benefit from high-calorie, high protein supplementation. What would you recommend?
   I would recommend that our patient consume Two Cal HN as supplementation. It is a high calorie, high protein, fluid management supplement that can be taken orally. However, this supplementation could be detrimental to her health due to its high fat content of 40.1%. I would introduce this supplementation to the patient slowly and increase amount given as tolerated.
26. Would glutamine supplementation help Mrs. Gaines during the healing process? What form of glutamine supplementation would you recommend?
I would recommend glutamine supplementation to the patient during the healing process because it is know to decrease symptoms such as diarrhea and GI discomfort. It is also said to speed up healing of the GI system as it is used in patients with atrophied GI tracts, like inflammatory bowel diseases. The form I would recommend would be the free form (L-glutamine) because if it was linked to more amino acids, then it could cause diarrhea.

27. What results can Mrs. Gaines expect from restricting all foods with gluten? Will she have to follow this diet for very long?
She will have to follow this diet her entire life and will experience complete GI recovery.

VI. Nutrition Monitoring and Evaluation

28. Evaluate the following excerpt from Mrs. Gaines food diary. Identify the foods that might not be tolerated on a gluten/gliadin-free diet. For each food identified, provide an appropriate substitute.

<table>
<thead>
<tr>
<th>Food</th>
<th>Substitute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cornflakes</td>
<td>Rice Chex, Panda Puffs, Gorilla Munch, Puffins</td>
</tr>
<tr>
<td></td>
<td>(Multi Grain or Honey Rice)</td>
</tr>
<tr>
<td>Bologna Slices</td>
<td>GF from following brands:</td>
</tr>
<tr>
<td></td>
<td>Oscar Meyer, Boar’s Head, and Tyson.</td>
</tr>
<tr>
<td>Lean Cuisine- Ginger Garlic Stir Fry with Chicken</td>
<td>Amy’s Frozen Pad Thai bowl</td>
</tr>
<tr>
<td>Skim Milk</td>
<td>Soy Milk</td>
</tr>
<tr>
<td>Cheddar Cheese Spread</td>
<td>Hummus</td>
</tr>
<tr>
<td>Green Bean Casserole (Mushroom soup, Onions, Greens, Green Beans)</td>
<td>Baked Potato with mushrooms, grilled onions, and green beans as toppings</td>
</tr>
<tr>
<td>Coffee</td>
<td>non flavored, black</td>
</tr>
<tr>
<td>Rice Crackers</td>
<td>check label for GF, Mary’s Gone Crackers - OK</td>
</tr>
<tr>
<td>Fruit Cocktail</td>
<td>OK</td>
</tr>
<tr>
<td>Sugar</td>
<td>OK</td>
</tr>
<tr>
<td>Pudding</td>
<td>Jell-O or Jello-O instant chocolate pudding with almond milk</td>
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<tr>
<td></td>
<td></td>
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<tr>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td>V8 Juice</td>
<td>OK</td>
</tr>
<tr>
<td>Banana</td>
<td>OK</td>
</tr>
<tr>
<td>Cola</td>
<td>OK</td>
</tr>
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Works Cited


