

Case Study Celiac Disease

1. The results tell you about the change in the anatomy of the small intestine?

The villi in the mucosal layer of the small intestine are damaged because of being exposed to gliadin found in gluten. The villi are the major component of the brush boarder where nutrients are absorbed, so damage to the small intestine is causing malabsorption of nutrients.

2. What is the etiology of celiac disease, is anything typical of celiac disease?

The gliadin in wheat, rye, and barley cause an autoimmune response in people with celiac disease, this causes the villi of the small intestine to become flattened and causes a disruption for absorbing nutrients. Mrs. Gaine's history includes that she is not absorbing nutrients properly because of her major weight loss. Celiac disease can appear after pregnancy and she gave birth 2 months prior. The disease is also hereditary and she explained that her mother and grandmother always had stomach problems. (Nelms, M., Sucher, K., Lacey, K., Long Ruth S. 2007. pg. 402)

3. How is celiac disease related to the damage to the small intestine that he endoscopy and biopsy indicate?

Damage to the small intestine villi and flattening of the villi is from the autoimmune response to the small intestine of eating gliadin found in products with gluten. (Defining Gluten. 2011)

4. What are AGA and EMA antibodies? Explain

AGA and EMA antibodies are part of the autoimmune response that is produced when a person with celiac disease consumes gluten. The antibodies that are produced attack the small intesting and cause injury to the villi. AGA and EMA are antibodies that will be present if a patient has Celiac Disease. (Nelms, M. et al. 2007. pg.403)

5. What is a 72 hour fecal fat test, what are normal results?

A 72 hours fecal fat test is used to determine if a patient is malabsorption fat and has a condition called Steatorrhea. It consists of a patient consuming 100 grams of fat per day for 3 days. Normal results are < 6 grams of fat in stool in a 24 hours period. (McCafferty, Deborah)

6. Mrs. Gaines results 11.5 fat/24hr what does this mean?

It means she has Steatorrhea, which is fat malabsorption.

7. Why was the patient put on a 100 gram fat diet?

The 100 gram fat diet was put in place to identify if she had Steatorrhea= >6 grams in 24hrs. (McCafferty, Deborah)

8. What is gluten, and where is it found?

Gluten is a protein found in wheat, rye, barley, commercial oats, bulgur, spelt, and kamut. Gliadin is part of gluten and causes the autoimmune response that attacks the villi in the small intestine. (Nelms, M. et al. 2007. pg.402)

9. Can patients on a gluten free diet tolerate oats?

Commercial oats are not allowed because they are processed on the same line as products with wheat, however there are oats that are gluten free. (Jackson, Frank.)

10. What other foods may have gluten?

Bouillon cubes, licorice, malt, beer, soy sauce made from wheat, brewer's yeast, caramel color, miso, french fries if they are fried in the same oil as products with gluten, candies and chocolate containing barley malt flavoring, deli meat with hydrolyzed wheat protein, flavored egg with hydrolyzed wheat protein, baked beans, dry roasted nuts, flavored tofu with soy, dates packaged with oat flour, soups and cream sauces can be thickened with wheat flour, cooking sprays, chips with wheat starch, herbal teas with barley malt flavoring, hot chocolate mix, vodka with hydrolyzed wheat protein, mustard items commonly with wheat flour, Worcestershire Sauce, Salsa, Curry paste, baking powder, seasoning mixes, wasabi peas, couscous, tabouli, matzoh, orzo, bulgur, Atta, Semolina, Smarties, check all labels gluten is hidden in many products! (Jackson, Frank), (Nelms, M. et al. 2007. pg.407-410)

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

Yes, if gut is compromised it may not be producing efficient amounts of lactase which breaks down lactose. If the villi are damaged it may be causing temporary secondary lactose intolerance until gluten is eliminated from the diet, and intestinal villi can regenerate height. Once the gut is regenerated normal absorption of lactose can occur.

12. UBW and BMI, explain nutritional risks.

% usual body weight is 80% which means moderate weight loss. In three months she lost 30 lbs, 11 pounds was pregnant weight but that is still 19 pounds in 3 months which is severe weight loss. Weight loss can mean that nutrients are not being absorbed properly and she may be experiencing wasting of muscle tissue and nutritionally deficient. BMI=16.3 under the average range for BMI meaning she does not have adequate energy stores.

13. Total energy and protein needs?

$$655 + (9.6 * 41.8) + (1.8 * 160.2) - (4.7 * 36) = \text{BEE} = 1175 \text{ kcal} \quad 1175 * 1.3 * 1.2 = \text{TEE} = 1833 \text{ kcal}$$

$$41.8 * 1.4 (\text{moderate}) = \text{Protein needs: } 58.5 \text{ grams}$$

14. 24 hour recall for adequacy.

Calories: (Self Nutrition Data, 2011)

Breakfast: **whole wheat toast**=75 cal/3g protein-**butter** 35 cal/0g protein-**tea**=45 cal 0 Pro

Lunch: **chicken noodle soup**=115 cal/8g protein-**saltines**=65 cal/1g protein-

.5 cup applesauce=70 cal/0g protein-**12 oz Sprite+ sips**= 140 cal/0 g protein

Total calories=545

Total Protein=12 grams

Breakfast: toast with butter that Mrs. Gaines cannot absorb because of Steatorrhea, gluten intolerance, and possible lactose intolerance. Hot tea should be avoided with steatorrhea because it can contain oxalate which should be restricted on a Steatorrhea diet, oxalate can build up causing kidney stones.

Lunch: Chicken noodle soup contains gluten, along with the crackers with gluten. Applesauce may help with Diarrhea, but 12 ounce soda can cause osmotic diarrhea.

Dinner: No dinner, probably making her calorie intake too low to maintain current weight, this can lead to muscle wasting also.

Wheat products with gluten will continue to damage the villi. Consuming fat will cause fat malabsorption and fatty diarrhea which causes energy loss and loss of ADEK fat soluble vitamins. Also calcium loss because of the loss of vitamin D. Secondary Lactose intolerance may cause diarrhea, cramping, and bloating after consuming butter. Fat that is not absorbed pairs with calcium so there will be an increase in oxalate that usually pairs with calcium. Oxalate can cause kidney stones. Sugary drinks can cause osmotic diarrhea which decrease absorption of nutrients. Hot tea should be avoided because of Oxalate causing kidney stones.

15. List possible nutrition problems using the diagnostic term.

Inadequate energy intake (NI-1.4), Inadequate oral food/beverage intake (NI-2.1), Inappropriate intake of types of carbo with gluten (NI-53.3), Altered GI function (NC-1.4), Impaired Nutrient Utilization (NC-2.1)

16. Identify all lab values that support a nutrition problem.

Mildly depleted albumin, mildly depleted prealbumin, low total protein, low osmolality, low magnesium, low cholesterol, positive for AGA and EMA antibodies, low H/H, low B12 and folate, low MCHC

17. Are the abnormalities identified in question 16 related to the consequences of celiac disease?

Yes, low absorption of electrolytes will lead to low magnesium. Low B12 and Folate could indicate decreased absorption at the brush boarder of the villi, low B12 and Folate cause large immature red blood cells. Low H/H indicates iron deficiency along with low B12 and Folate cause macrocytic normochromic anemia. Protein status is low, and so is prealbumin which indicates protein status, this could be muscle wasting because inadequate absorption, and decreased energy intake. Low cholesterol is indicated from Steatorrhea from damage of Villa from Celiacs Disease. Positive AGA and EMA are indicators of antibodies formed when there is an autoimmune response from the gliadin in gluten.

18. Are any symptoms consistent with lab her lab values?

Yes, low energy is an indicator of anemia, decreased absorption and energy intake. Weight loss is from decreased absorption and decreased energy intake. Diarrhea can cause decreased absorption of fat, protein, vitamins and weight loss. Foul smelling diarrhea is an indicator for fat malabsorption which also explains a low cholesterol lab value.

19. Evaluate anthropometric data.

BMI=16.3(underweight), IBW=115#, %IBW=80%(mildly depleted energy stores), %UBW=82%(moderate weight loss), 18% in 3 months=severe weight loss

20. List possible nutrition problems using the diagnostic term.

Breastfeeding difficulty (NC-1.3), Altered Nutrition-related laboratory values (NC-2.2), Underweight (NC-3.1), Involuntary weight loss (NC-3.2), Food and nutrition-related knowledge deficit (NB-1.1)

21. VA Screening From.

Overall nutritional status is 3.

22. Highest priority PES statements:

Involuntary weight loss (NC-3.2) related to diarrhea, malabsorption of fat, possible lactose tolerance, overall malabsorption as evidenced by 18% weight loss in 3 months.

Food and nutrition-related knowledge deficit (NB-1.1) related to consuming gluten products, lactose products, and fat as evidenced by recent diagnoses of Celiac Disease and damaged intestinal villi.

23. For each PES statement establish a goal and an appropriate intervention.

For involuntary weight loss, she will need to stop consuming any products with gluten so that her villi health can regenerate. Until her villi regenerate height she will need to eliminate fat, and lactose because of her inability to absorb it, causing steatorrhea, and diarrhea. We also want her lab values to return to normal.

For knowledge deficit Mrs. Gaines will need to be educated on what Celiac Disease is and what causes it. I would give her handouts about the disease, along with reputable websites that include lists of foods that are gluten free. She will need to understand that gluten will need to be completely eliminated from her diet for the rest of her life. She will need information on where gluten is hidden in processed food products and the obvious foods to stay away from. Lactose and fat will be reintroduced as soon as the villi have time to heal. Introducing lactose and fat will be done slowly, and done by monitoring effects the body has from consuming lactose or fat.

24. What type of diet would you initially begin when considering the potential intestinal damage?

No Gluten. For Steatorrhea diet of low fat, low oxalate, water soluble fat miscible vitamins, and MCT oil until intestinal health allows for fat absorption. Lactose free until lactase enzymes regenerate.

25. What type of supplementation is appropriate?

Ensure Plus: one 8 ounce bottle contains 350 calories, 13 grams of protein, 24 vitamins, lactose free, and contains omega 3. (Ensure Plus)

26. Would glutamine supplementation be useful, what form?

Glutamine therapy can be used for intestinal health because it is the major energy source for the intestine. It is shown to improve mucosal damage. Cells in the intestine require it and it maintains the integrity of the gut, impedes bacterial translocation and improves nitrogen balance in catabolic stress. Glutamine is an amino acid that when it is consumed it turns into glutamate that can be used as fuel. Glutamine is a nonessential amino acid made by the body, but can become conditionally essential if the gut is compromised. (NFSC 440)

27. What result can be expected with restricting all gluten, will she have to stay on this diet?

Mrs. Gaines can expect that with restricting gluten her villi will return to normal height and regain the ability to absorb nutrients. She will have to stay on a gluten free diet, because eating gluten will re damage her small intestine villi. Once her villi have regained height she can start reintroducing fat and lactose.

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