Kaitlyn Click & Megan Chokreff

Professor Matuszak

KNH 411

11 September 2014

GERD Case Study 7

*I. Understanding the Disease and Pathophysiology*

**1. How is acid produced and controlled within the gastrointestinal tract?**

The acids are produced by cells in the stomach. These cells secrete hydrochloric acid and intrinsic factors. There are four major chemical messengers: acetylcholine, histamine, and gastrin which stimulate secretions and then somatostatin which inhibits secretions. The acetylcholine is a neurotransmitter that stimulates parietal, chief, and ECL cells. Histamine acts on the partial cells to increase the hydrochloric acid release. The secretions are produced before the food enters the stomach in preparation to digest the food. The digestion is is broken down into three phases. First, cephalic phase where the HCL and pepsinogen are released from the smell, taste, or even sight of food. Second, gastric phase, where the food enters the stomach and more gastric juices are released. Third is the intestinal phase, where is prepares the small intestine for the chyme that is going to be the next step in the digestion process. The mechanical side is when the stomach uses its muscles to churn up the food and break it down so that it will be able to go through the rest of the body. The HCL is important when it comes to breaking down of the protein because it unravels and denature the protein so the body can absorb it (Nelms, Sucher, Lacey & Roth, 2011, p. 345-346).

**2. What role does lower esophageal sphincter (LES) pressure play in the etiology of gastroesophageal reflux disease? What factors affect LES pressure?**

The LES’s job is to control the release of the bolus from the esophagus into the stomach. The only time it is open is when the action of swallowing is taking place; all other times it is closed to make sure that the esophageal mucosa is protected from the stomach contents. When it is not protected this is when air can get into the stomach and can cause a pressure in the stomach. This pressure when off balance will not be able to prevent stomach contents from refluxing back into the esophagus, which will allow more air to enter the stomach. Factors that affect the LES pressure could be neurotransmitters which are used to allow the LES to relax and contract when needed. Other factors that affect it are smoking, some foods, some medications, a hormone gastrin and more (Nelms, Sucher, Lacey & Roth, 2011, p. 343-344).

**3. What are the complications of gastroesophageal reflux disease?**

Barrett’s Esophagus involves a change in the epithelial cells of the esophageal mucosa and is usually a big complication of GERD. Also, there could be impaired swallowing, aspiration of gastric contents into the lungs, ulcerations, and perforation or stricture of the esophagus. These complications can grow progressively worse which will be affect their life and can go unnoticed if untreated. If the complications impair swallowing then the patient will be put on a restricted diet. This could then cause them to have nutritional deficiencies and unneeded weight loss (Nelms, Sucher, Lacey & Roth, 2011, p. 352-353).

**4. The physician biopsied for *H. pylori*. What is this?**

H. pylori is when there is a bacteria that infects the stomach and can be present in almost half the people in the world. When there are complications in the stomach most of the doctors test for this because it can easily be treated with antibiotics. H. pylori can have the same signs and symptoms as a peptic ulcer so doctors make sure to rule out H. pylori before they jump to the wrong conclusion (Nelms, Sucher, Lacey & Roth, 2011, p. 362).

**5. Identify the patient’s signs and symptoms that could suggest the diagnosis of gastroesophageal reflux disease.**

The signs and symptoms of GERD are attributed to a reflux of gastric acid and pepsin and occur during transient LES relaxation. Other symptoms include dysphagia, heartburn, increased salvation, and belching. Pain can get really severe and may radiate to the back, neck, or jaw. Pain can get worse when they lay down and can start in one area and then progress throughout the body if it is not treated correctly. Mr. Nelson’s symptoms that suggest he has GERD are his weight gain, the heme and stool found in his respiratory, there was a tenderness in the epigastric, he has heartburn all the time, and is in a lot of pain. These are all suggestions that show he is suffering from a reflux disease (Nelms & Roth, 2014, pg. 73-74).

**6. Describe the diagnostic test performed for this patient.**

Hematology - Blood tests were conducted to be able to see what if all the substances in the blood fall in normal range, such as LDL, HDL, cholesterol, and triglycerides.

Ambulatory 48-hour pH monitoring with Bravo pH Monitoring System - pH monitoring is done for GERD patients because it will keep track of how much stomach acid is in the esophagus along with how well the acid is staying in the stomach.

Barium esophagram was completed to be able to examine the esophagus and understand what is happening in the esophagus and to be able to treat it correctly.

Endoscopy with biopsy - This is where they will take a scope to look deeper into the esophagus or the stomach to get a better understanding on how to treat the disease. They will take a piece of either out, complete test, and assess what the next step should be. Either it could be cured with the right nutrition and increase in physical activity, or the patient could be severe and need a surgery.

George F. Longstreth. Medline Plus. (2012). *Esophageal pH Monitoring.* Rockville Pike,

Bethesda, MD.

**7. What risk factors does the patient present with that might contribute to his diagnosis? (Be sure to consider lifestyle, medical, and nutritional factors.)**

It was stated that he had gained 35lbs since his knee surgery which he attributes to the lack of ability to run and hasn’t found another replacement. Also, he stated that he is eating and drinking more because of stress which could lead to the LES not working properly. When he eats his meals they are usually healthy with a variety of fruits and vegetables but his snacking is what is going to make it difficult to control his weight. Eating out a lot and the amount of soda he drinks could also be factoring into his GERD. Going to McDonald’s and then to KFC for dinner all in the same day will not be good for his continued health (Nahikian-Nelms & Roth, 2013, p.72-76).

**8. The MD has decreased the patient’s dose of daily aspirin and recommended discontinuing his ibuprofen. Why? How do aspirin and NSAIDs affect gastroesophageal disease?**

The MD has told the patient not to take aspirin or NSAIDs because they are non-steroidal anti-inflammatory drugs which promote reflux to happen. This means that the drugs are making the GERD worse and not better because they inhibit certain protein-hormone substances from forming which in turn promotes the GERD. The MD should recommend antacids because they stabilize the acid in the stomach and they are a quick and easy fix. If those do not work then the MD would probably recommend histamine-2 receptor blockers. The Histamine blockers prevent the secretion of stomach acid by inhibiting the action of histamine.

Gastroesophageal Reflux Disease (GERD). (2011). Retrieved September 8, 2014, from

http://www.lef.org/protocols/gastrointestinal/gastroesophageal\_reflux\_06.htm

**9. The MD has prescribed omeprazole. 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?**

Omeprazole is a proton pump inhibitor, this means that they block H+, K+-ATPase enzyme, a component of HCL production. The others drugs that are available in this class are lansoprazole, pantoprazole, rabeprazole, and esomeprazole. Then there is an over-the-counter strength Prilosec that can also be used to treat GERD. Other groups of medications that will also be able to treat GERD are antacids, foaming agents, H2 Antagonists, and Prokinetics (Nelms, Sucher, Lacey & Roth, 2011, p. 353).

*II. Understanding the Nutrition Therapy*

**10. Summarize the current recommendations for nutrition therapy for GERD.**

There are 4 steps when it comes to nutritional therapy for GERD. The first step is Nutritional Implications which is mainly identifying the foods that are causing the GERD and then reducing those food. Also, at this point we would add any foods that would be healthy for the patient to eat which will also help reduce the gastric acids in the stomach. The second step is the Nutrition Assessment where the RD we will look over the 24-hour recall, diet history, and food dairy with the patient and focus on the consumption of foods that will lower the pressure on LES. Also we want to focus on foods that will be able to increase gastric activity or foods that cannot be tolerated by the patient. Another aspect we would look at is his lifestyle choices, such as smoking, drinking, and the lack of physical activity. The third step is Nutrition Diagnosis includes focusing on inadequate beverage intake, excessive fat intake, swallowing difficulties, food/medicine interaction, weight, and vitamins/mineral intake. Also, there would be discussion about the patients knowledge about GERD and his understanding of what is happening. The fourth and final step is Nutrition Intervention, which is when the goals are discussed. This is where we would recommend not drinking alcohol or caffeine, eating more frequently but smaller meals, and to avoid foods like chocolate, mint and high fat foods. Since he is mildly obese talking about goals on his weight and ways to increase physical activity (Nelms, Sucher, Lacey & Roth, 2011, p. 353-354).

*III. Nutrition Assessment*

**11. Calculate the patient’s %UBW and BMI. What does this assessment of weight tell you? In what ways may this contribute to his diagnosis?**

Mr. Nelson’s BMI is 31.8 which puts him in the obesity class I. Then his %UBW is 119%. Both of these assessments are higher than they should be which means that his weight is contributing to his diagnosis and can also cause other serious problems if he does not do something about his weight soon. Also, if he loses this weight and get back into the normal range then he will decrease his chances of getting CVD and decrease the symptoms to GERD. This will require a modification in his amount of physical activity and also his dietary intake.

BMI= kg/m2

Current weight: 215 lbs/2.2= 97.7 kg

Height: 69 in x 2.54 = 175.3 cm=1.753 m= 3.07 m2

BMI= 97.7/3.07= 31.8

%UBW = (100 x Actual Weight)/Usual body weight

= (100 x 215)/180

= 119%

http://www.mercycares.com/uploads/pdf/Adult%20nutrition%20assessment.pdf

**12. Calculate energy and protein requirements for Mr. Nelson. How would this recommendation be modified to support a gradual weight loss?**

Hamwi Method to obtain Ideal Body Weight:

106 lbs + 6(9)= 160 lbs

160 lbs/2.2= 72.7 kg

IBW + 0.25 (usual- IBW)= 160 + 0.25 (215-160)= 173.75 lbs

173.75 lbs/2.2= 79.0 kg

Mifflin-St.Jeor:

REE= 10 x wt(kg) + 6.25 x ht(cm) – 5 x age (yrs) + 5

= 10 x 79 kg + 6.25 x 175.3 cm – 5 x 48 + 5

= 790 + 1095.6 – 240 + 5

= 1650.6 kcal

Actual energy needs using the activity factor of 1.6:

TEE= REE x activity factor

1650.6 x 1.6=2641 kcal

~2600-2700 kcal needed to maintain weight

Protein requirements:

RDA: 0.8 g/kg/day

0.8 g x 97.7 kg= 78.2 g protein/day

On average he is eating about 3,600 kcals a day based on the 24-hour recall. He is not eating a lot of food but the food that he chooses are high in calories and fat. We would recommend that he cuts 500 kcals a day off his diet so that he will be able to lose about a pound a week. He will need to do this until he reaches a normals BMI. This means that we would want him to start by packing his lunch and cooking dinner in because it will take out all the fried fatty foods that he has been consuming. If they do need to eat out then I would recommend him go to subway or get something that is not fried but just grilled. He is consuming a lot of drinks that are carbonated or are high in calories. I would suggest that he is only limited to one soda a day, then for the rest of the day either have one iced tea and the rest water. He was not drinking nearly enough water during the day, so switching from pop to water will be beneficial. The meals that he eats during the day are healthy so sticking to those regimens will be good but the snacking is what is really increasing his energy intake. Instead of grabbing crackers, chips, or cookies when he comes home, he needs to be grabbing a vegetable and eat it with hummus. When switching healthier options for the snacks he will be able to significantly decrease the amount of calories and fat in his diet.

(Baur, Liou & Sokolik, 2012, pg.118)

**13. Complete a computerized nutrient analysis for this patient’s usual intake and 24-hour recall. How does his caloric intake compare to your calculated requirements?**

Mr. Nelson’s current caloric intake is extremely high compared to his calculated requirements. He would need to consume between 2600 and 2700 calories to maintain his weight. His 24-hour recall shows that he is intakes just about 1000 calories over that amount. If Mr. Nelson continues to eat the types of food and amount that he does, he will continue to gain weight very rapidly. Many modifications will need to be made to his diet in order to decrease the caloric intake, and most importantly, saturated fats.

He states that in his usual diet he has a whole wheat bagel with ham, an apple, a cup of chips, and diet soda. This is a lot better than the fried chicken sandwich from McDonalds, small fries, and a large tea. If he would pack his lunch more with a few substitutions then he will be off to a good start. I would first suggest to switch the iced tea to just water and then every other day bring a vegetable instead of chips. Then for dinner he should switch to grilled and salads and not KFC with the potato salad. For this meal, I would suggest to drink one cup of milk because of the lack of calcium and then after that drink water if he is still thirsty.

Food log from Fitday based on Mr. Nelson’s 24-hr recall:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Food** | **Amount** | **Calories** | **Fat (g)** | **Carbohydrates (g)** | **Protein (g)** |
| Crispix | 2 cups | 214 | 0.6 | 50.4 | 3.3 |
| Skim milk | 1 cup | 83 | 0.2 | 12.2 | 8.3 |
| Orange juice | 16 oz | 219 | 0.5 | 52.0 | 3.1 |
| Diet Pepsi | 3 12 oz | 0 | 0 | 0 | 0 |
| Fried chicken sandwich from McDonalds | 1 sandwich | 635 | 29.9 | 57.4 | 39.1 |
| French fries | Small | 229 | 11.0 | 30.2 | 2.4 |
| Iced tea | 32 oz | 354 | 0.0 | 88.6 | 0.0 |
| Chips | 2 cups | 350 | 24.0 | 31.8 | 4.2 |
| Beer | 1 can | 98 | 0.0 | 7.1 | 0.9 |
| KFC Fried Chicken Breast | 1 breast | 220 | 16.7 | 10.0 | 7.4 |
| Potato salad | 1 ½ cups | 380 | 18.5 | 50.3 | 4.7 |
| Green bean casserole | ¼ cup | 25 | 0.0 | 4 | 0.0 |
| Fruit salad | ½ cup | 48 | 0.2 | 12.4 | 0.6 |
| Baked beans | 1 cup | 314 | 7.6 | 51.3 | 14.2 |
| Iced tea | 8 oz | 95 | 0.0 | 23.9 | 0.0 |
| Ice cream made with skim milk | 2 cups; 1 cup | 408 | 0.0 | 89.0 | 13.3 |
|  | **Totals:** | **3673** | **109.1** | **570.7** | **101.3** |

Percentages of distribution of macronutrients:

Carbohydrates:

570.7 g x 4 kcal/g= 2282.8 kcal/3673 kcal= 62%

Protein:

101.3 g x 4 kcal/g= 405.2 kcal/3673 kcal= 11%

Fat:

109.1 g x 9 kcal/g= 981.9 kcal/3673 kcal= 27%

Food Log. (n.d.). Retrieved September 9, 2014, from [http://www.fitday.com](http://www.fitday.com/app/journal/foods#04SEP2014).

**14. Are there any other abnormal labs that should be addressed to improve Mr. Nelson’s overall health? Explain.**

Mr. Nelson’s lipid profile is a concern to his overall health. His cholesterol, LDL, LDL/HDL ratio, and triglyceride levels are very high and his HDL levels are very low. These abnormalities should be addressed through physical activity, diet modification, and nutrition therapy. Increasing his physical activity and following a modified diet, such as the DASH diet, will help Mr. Nelson return these lab values to a normal range and therefore, help him live a healthier life.

|  |  |  |
| --- | --- | --- |
| **Chemistry** | **Reference Range** | **9/22** |
| Cholesterol (mg/dL) | 120-199 | 220 |
| HDL-C (mg/dL) | >55 F, >45 M | 20 |
| LDL (mg/dL) | <130 | 165 |
| LDL/HDL ratio | <3.22 F  <3.55 M | 8.25 |
| Triglycerides (mg/dL) | 35-135 F  40-160 M | 178 |

**15. What other components of lifestyle modification would you address in order to help in treating his disorder?**

Other components that will need to be addressed in order to treat his disorder will be gradually increasing his physical activity, eliminating his alcohol intake, eliminating foods that could flare up his symptoms, such as the fried foods that he consumes, extreme diet modifications, and also implement stress-relievers in his life. Stress-relievers can include activities or hobbies that he enjoys or simply increasing exercise which will prevent him from eating and drinking due to his stress levels. He should start to follow a restricted diet and have regular visits to a dietitian. He should keep a diet log as well as a physical activity log to regularly review with the dietitian. Another component to address is that he should eat at home more often instead of at fast-food places where sodium, fat, and cholesterol are high in food choices. Simple lifestyle changes such as parking further away from the entrance at work can be effective changes to address as well.

*IV. Nutrition Diagnosis*

**16. Identify pertinent nutrition problems and corresponding nutrition diagnoses and write at least two PES statements for them.**

PES #1: Excessive energy intake (NI-1.3) related to being mildly obese as evidenced by patient’s 24-hour recall, weight of 215 pounds, and BMI of 31.8.

PES #2: Physical inactivity (NB-2.1) related to a sedentary lifestyle as evidenced by self-report of only activity is playing with children on the weekends.

(Academy, 2014)

*V. Nutrition Intervention*

**17. Determine the appropriate intervention for each nutritional diagnosis.**

PES #1 Intervention: Since client is eating an excess intake of calories, we would want to cut his intake from 3,600 to 3,000 for about 3 months. This means that he will be losing roughly a pound a week. We would want to keep him on this diet for three months and then have him come back for a follow up appointment. At this follow up appointment I would then re-weigh him and have him bring in a 24-hour recall. If he is sticking to the plan and eating right then I would drop his caloric intake by another 400 kcal so that he will fall into the normal range he should be. By switching out the fried food for grilled foods and some chips for carrots, then he will be able to drop the kcals very quickly. During this session, we would also educate him and his wife on healthy meal options, grocery shopping methods, cooking, and the benefits of eating at home.

PES #2 Intervention: We would introduce the client to a physical activities that are easier on his knees, such as swimming, and parking farther away. We will also refer Mr. Nelson to a physical therapist to help him with his knees pain. Then once he is pain free we will implement him on a “step plan” of 3,000 steps a day and then increase that by 500 steps/week after the goal is met. This will make sure that he is keeping active while learning about the different ways to keep active but also not be in pain. We would want Mr. Nelson to continue to play with his kids as much as he can.

**18. Using Mr. Nelson’s 24-hour recall, outline necessary modifications you could use as a teaching tool.**

|  |  |  |
| --- | --- | --- |
| **Food Item** | **Modification** | **Rationale** |
| Crispix | This is an acceptable breakfast choice for Mr. Nelson however, he is currently eating two servings. It would be beneficial to decrease this amount by half a serving. | Cheerios, bran flakes, and Crispix are acceptable options for Mr. Nelson. These are lower calorie, fat, and sugar cereal options compared to other cereals available. |
| Skim milk | This is a good choice for Mr. Nelson. | It is low fat and lower calories than other milk options. It is also a good source of calcium. |
| Orange juice | Instead of orange juice, he should be drinking more water. | Orange juice is very acidic and could be exacerbating some of his symptoms. He does not drink any water currently so it is important that he starts his day with water to stay hydrated. |
| Diet Pepsi | Over time, Mr. Nelson should decrease his soda intake. Instead of having three Diet Pepsi’s during work, he should at first try to get by with one and eventually work his way to choosing flavored water and/or regular water. | It would be ideal for Mr. Nelson to drop this habit right away but that is not a realistic intervention for him. If he makes little goals to slowly decrease his intake, there is a better chance he will be able to kick the habit and start drinking more water during the day. |
| Fried chicken sandwich | A healthier option would be a grilled chicken sandwich. | Fried food makes Mr. Nelson’s symptoms worse. If he chooses a grilled option, he will not only be choosing a healthier meal but will also be reducing his pain. |
| French fries | A healthier alternative to french fries purchased at McDonalds would be apple slices. | Exchanging french fries for apple slices would be a good way to get more fruit into his diet while also decreasing his fried food intake. |
| Iced tea | A healthier option would be diet iced tea or even flavored water | Iced tea is high in calories and sugar so switching to diet he wouldn't be drinking his calories. Flavored water is the best option because he isn't getting the right amount of water for the day. |
| Chips | I would suggest that he choose either a fruit or vegetable option here such as carrots or peaches. | This would lower the sodium, fat, and cholesterol from his diet. When switching to more fresh foods he will get more vitamins and minerals. |
| Beer | I would encourage Mr. Nelson to eliminate his alcohol intake. | Alcohol can cause his symptoms to be worse and are unnecessary extra calories. |
| Fried chicken | Instead of fried chicken, Mr. Nelson could choose grilled chicken. | Grilled chicken is a better alternative because it is not fried, which makes his symptoms worse. It is also much healthier in terms of amount of fat, cholesterol, and sodium. |
| Potato salad | Instead of potato salad, which includes high fat ingredients such as mayonnaise, Mr. Nelson could have a baked potato or sweet potato. | A baked potato or sweet potato would cut out many calories compared to potato salad. |
| Green bean casserole | Instead of a casserole, Mr. Nelson could get a fresher vegetable option instead like fresh green beans or steamed broccoli. | Choosing a fresher option will help eliminate extra sodium, fat, and calories. |
| Fruit salad | Fresh fruit is a great option for Mr. Nelson. | Mr. Nelson should be encouraged to keep a steady amount of fruits and vegetables in his diet. |
| Baked beans | A modification would be a low-sodium option of beans. | The lower sodium decreases the sodium from 1100mg to 0 and it also decreases the amount of empty calories in his diet. |
| Milkshake | Instead of a milkshake, a better option would be frozen yogurt or even something like frozen grapes, which are sweet and cold and could curb his sweet tooth. | Mr. Nelson can have sweets but he needs to limit them throughout the day. The frozen yogurt will help with that but also decrease the extra kcals and fat. |

**References**

Academy of Nutrition and Dietetics (2014). *Pocket guide for international dietetics & nutrition*

*terminology (IDNT) reference manual: Standardized language for the nutrition care*

*process.* Chicago, Ill: Academy of Nutrition and Dietetics.

Gastroesophageal Reflux Disease (GERD). (2011). Retrieved September 8, 2014, from

http://www.lef.org/protocols/gastrointestinal/gastroesophageal\_reflux\_06.htm

George F. Longstreth. Medline Plus. (2012). *Esophageal pH Monitoring.* Rockville Pike,

Bethesda, MD.

Nahikian-Nelms, M., & Roth, S. L. (2013). *Medical nutrition therapy: A case study approach*. Stamford, Connecticut: Cengage Learning.

Nelms, M. N., Sucher, K., Lacey, K., & Roth, S. L. (2011). *Nutrition therapy and*

*pathophysiology* (2nd ed.). Belmont, CA: Brooks/Cole Cengage Learning

Understanding Upper Endoscopy. (n.d.). Retrieved September 8, 2014, from

http://www.asge.org/patients/patients.aspx?id=378