Amy Harris
11/3/08
NFSC 370

Case Study #1: Diverticular Disease and Colostomy

I. Pathophysiology

Diverticulosis is the condition of having diverticula which are small pouches that bulge outward through weak spots in the colon. When these diverticula become inflamed and infected the condition is then called diverticulitis. This develops when there's an accumulation of fecal matter and bacteria within the diverticula. Normally, most people with diverticulosis don't experience any pain or discomfort. The diverticula themselves don't seem to produce any symptoms. It is only when these diverticula become inflamed that symptoms like pain in the left lower abdomen, nausea, vomiting, cramping and a change in bowel habits can occur ("Diverticulosis and Diverticulitis").

Diverticula usually result from a chronic low fiber diet and the incidence of diverticulosis increases with age due to decreased strength of the intestinal wall. In the United States, 10% of Americans over the age of 40 have diverticulosis and as they age this number increases. Over half of all Americans over 60 have diverticulosis. Of these people who have diverticulosis, about 10 to 25% of them will develop diverticulitis within their lifetime. The incidence of diverticulosis is about 300,000 new cases per year and the prevalence is 2 million for people over 60 in the United States ("Prevalence and Incidence of Diverticular Disease").

The main cause of diverticular disease (which is diverticulosis and diverticulitis together) is a low fiber diet. The reason why fiber is so important, especially insoluble fiber when it comes to colon health, is because it decreases the intraluminal pressure of

the colon, increases the diameter of the colon and decreases the transit time through the colon acting as a laxative. Fiber in the diet decreases the likelihood of constipation which can contribute to the formation of diverticula. When a person experiences constipation, they are more likely to strain and push when passing stool during a bowel movement. This straining increases the pressure in the colon and may cause the colon lining to bulge out from the weakened spots in the colon wall (Nelms, Sucher, Long 497). These bulges are the diverticula and they are what can become inflamed and infected. Obesity, steroids, alcohol, caffeine, possibly lack of exercise, and cigarette smoking may also increase the risk for developing diverticulosis (Nelms, Sucher, Long 496).

If diverticulitis persists, it can lead to bleeding, obstructions, infections, small tears, ruptures which can lead to peritonitis and fistula formation. Although bleeding is a rare complication of diverticulitis, if it is present in the stool it usually means that a blood vessel in the diverticulum weakened and burst. If the diverticula become infected and antibiotics aren't able to clear up the infection, an abscess (which is a localized collection of pus) may form in the colon wall. This abscess may cause swelling and may destroy tissue. In response, doctors will try to clear it up with antibiotics, if it remains in the wall of the colon, or they may need to manually drain it with a catheter. Infected diverticula may sometimes develop perforations. These perforations may leak pus out into the abdominal cavity, a condition called peritonitis. A person with peritonitis will become very ill with nausea, vomiting, abdominal tenderness and fever. This is a potentially fatal condition which requires surgery to clean the abdominal cavity and remove the damaged part of the colon. A fistula may form if the inflamed outpouchings of the colon come into contact with another organ in the body and they end up sticking together. The most

common fistulas form between the bladder and the colon which can cause severe, long lasting urinary tract infections. If the colon becomes infected and a scar forms, the scar tissue may end up forming a partial or total blockage called an intestinal obstruction. If total blockage results, feces will build up and will not be able to be excreted. This can become extremely toxic and requires emergency surgery to correct the problem. If there is only partial blockage, doctors are able to take their time and plan out a surgery as opposed to rushing right in and fixing the problem as soon as possible ("Diverticulosis and Diverticulitis").

Mr. Gonzalez experienced many of the symptoms described above. He was an obese man which is one of the factors that may increase the risk for developing diverticulosis. When symptoms of diverticulitis started presenting, he experienced a lot of pain in his LLQ which is very typical for this disease. He also noticed an increase in flatus and severe pain when he ate foods that normally gave him gas. This indicates that his intestines were more irritated and inflamed than normal. When the attacks became severe, he developed a high fever and diarrhea that continued for three days which indicated an infection in his colon. During his attacks, he did not eat much because of the discomfort. Avoiding food is very typical of people who experience abdominal pain after eating and can pose a huge nutritional risk. However, one night he ate a bag of popcorn and experienced severs cramps, flatus, diarrhea and bright red blood in his stool. Eating popcorn seemed to have irritated his diverticula since nuts, seeds and hulls may get caught inside them and cause symptoms to appear (Nelms, Sucher, Long 497). It is recommended that anyone with diverticular disease avoid these food products. After seeing blood in his stool, he decided to go to the hospital. Once there, he contracted a

high fever and continued having blood in his stool. The slight bleeding seemed to come from the erosion that had been taking place for many years in his sigmoid colon while the heavier bleeding was due to the breaking of small blood vessels. Because his colon was so eroded and inflamed, he had to have a partial colectomy with a resulting colostomy in order to resolve the problem. Mr. Gonzalez is a good example of how diverticulosis can develop into diverticulitis and can continue on to result in a colectomy and ending with a colostomy.

II. Biochemical Measurements

Test	**Result**	**Normal**	**Test**	**Result**	**Normal**
Hgb	11g/dl	14-18g/dl	**BUN**	12mg/dl	10-20mg/dl
Hct	33%	42-52%	**Creat**	.9mg/dl	.6-1.2mg/dl
K+	3.4mEq/L	3.5-5mEq/L	**Cl-**	97mEq/L	98-106mEq/L
Na+	133mEq/L	136-145mEq/l	**WBC**	13,000/mm^3	5,000-10,000/mm^3

(Pagana, Pagana 521, 518, 750, 874, 961, 323, 260, 1003).

Mr. Gonzalez had low Hgb and low Hct levels because of the GI bleed he had been having for an extended period of time due to the erosion that was taking place in his sigmoid colon. He was also experiencing heavier bleeding due to the breaking of small blood vessels which would lead to blood loss and low Hgb and Hct values.

Low K+ and Na+ are electrolytes that are normally absorbed in the colon. When a patient has diarrhea, these electrolytes pass through the colon too fast to be absorbed and are thus excreted with the feces (Nelms, Sucher, Long 473). Mr. Gonzalez had below normal lab values for these electrolytes as a result of the diarrhea he had been having prior to this blood test.

Low chloride levels make sense since it goes along with the low potassium and sodium levels (the other electrolytes). Since chloride follows sodium losses, a low sodium reading would probably be accompanied by a low chloride reading (Pagana, Pagana 260).

An increase in the WBC count indicated that his diverticula had become infected.

III. Anthropometric Measurements

IBW range: 106 + 42 = 148 + 10% = 162.8; -10% = 133.2

% IBW = 208 / 148 x 100 = 140.5% IBW (Obese)

BMI = $(208 / 67^2) \times 703 = 32$

His % IBW indicates that he is obese and his BMI places him in the Class I obesity category.

IV. Drug-Nutrient Interactions

The two drugs Mr. Gonazalez was taking were Lisinopril and Ampicillin. Lisinopril is an ACE inhibitor and it's used primarily to treat hypertension ("Lisinopril 1"). Ampicillin is an antibiotic used to treat bacterial infections (Pronsky 39). It is suggested that Ampicillin be taken on an empty stomach because food decreases the rate and extent of absorption. It may cause taste changes, an inflamed tongue and mucus membranes within the mouth, nausea, vomiting, and diarrhea (Pronsky 39). Ampicillin may cause a rash or a rare allergic reaction that can be fatal. If the patient has shown sensitivity to penicillin in the past, ampicillin should not be administered.

Lisinopril can cause anorexia and weight loss. Potential adverse reactions include fatigue, diarrhea, dizziness, nausea, and blurry vision. More serious side effects include

liver problems, fainting, chest pain, dark urine, abdominal pain or persistent fatigue/nausea (Lisinopril 2).

V. Medical Nutrition Therapy Recommendations

Since the PES statement is to be written after Mr. Gonzalez is discharged from the hospital after having undergone a partial colectomy with a resulting colostomy, I feel that it's very important for him to be educated about the procedure and what he should be doing nutritionally to support healing and to live a healthy lifestyle. In his past, he has not been the most cooperative patient when it came to following through on diets or taking medication that would help him heal. Whenever he started to feel better, he discontinued the treatment but later on the symptoms would reappear. Therefore my PES statement for Mr. Gonzales is: Food and nutrition-related knowledge deficit (NB-1.1) related to no prior education and a new ostomy procedure as evidenced by his inability to associate his severe constipation and diarrhea to diverticulitis but instead associated it with something he ate. I think that if Mr. Gonzalez was educated about his disease and the importance of managing it to reduce pain it would be very useful to him. Now that he has the colostomy bag, he will need to be educated about what to eat, how to take care of it, what activities he can engage in etc. This will be very important in determining the success of this patient.

Dietary recommendations for diverticulosis and diverticulitis differ from one another. With diverticulosis the main objective is to decrease the likelihood of forming more diverticula and the best way to do that is through a high fiber diet. Fiber will help keep the intestinal muscles toned and will decrease the likelihood of constipation. Since a low fiber diet is what causes diverticulosis as well as increasing the likelihood of

developing diverticulitis, it is recommended that someone with diverticulosis get 6 to 10 grams more fiber per day than the normal recommendation of 25 to 35g/day (Nelms, Sucher, Long 497). Fiber should be increased gradually to give the intestine time to get used to it. Because of the high fiber diet, it is very important to consume an adequate amount of fluid to soften the stool and make it easier to excrete. Exercise should also be a part of the daily routine to increase overall health.

Diverticulitis is when the diverticula become inflamed or infected. During this time, the main objective is for the inflammation to subside and for the colon to heal. The best way to do this is through a low residue diet that won't irritate the colon in any way. Sometimes the patient will be put on bowel rest at first, then progressed to clear liquid and finally onto a low-residue diet if the inflammation is very serious. After the inflammation has passed, the diet should be expanded to include more and more fiber until maximum fiber intake has been reached. Eating a high fiber diet when there's no inflammation present will decrease the chance of the colon becoming inflamed again.

For diverticular disease in general, it is recommended that patients avoid caraway seeds, nuts, popcorn hulls and sunflower, pumpkin and sesame seeds (Nelms, Sucher, Long 497) as these foods have the potential of getting caught in the diverticula and may lead to diverticulitis.

For Mr. Gonzalez, during the healing period immediately following surgery, I would recommend NPO that will be advanced to a liquid diet and then to a low fiber diet for about 8 weeks to prevent obstructions and promote stoma healing. It is important to remember, that during the period of recovery, the goal is for the stoma to heal (minimize the risk of obstruction), to maintain normal fluid and electrolyte balance, reduce

excessive fecal output and minimize gas and flatulence (Nelms, Sucher, Long 499). It is also during this time that food intolerances will be identified and excluded from the diet. One of the most important things Mr. Gonzalez can do during recovery would be to drink plenty of fluids to encourage the transit of fecal matter through the intestine and to remain hydrated. For the first six to eight weeks after surgery, Mr. Gonzalez will want to avoid food that may cause a stoma obstruction. These foods include: tough fibrous meats, stringy vegetables, nuts, spinach, corn, peas, raisins, seeds and popcorn etc (Nelms, Sucher, Long 499). He will also want to eat foods that are odor-reducers such as yogurt, buttermilk and cranberry juice as well as avoiding foods that form gas such as legumes, vegetables, fruits, milk, fatty foods etc. I would recommend that he not drink through a straw and avoid inactivity as this can increase the amount of gas entering the colostomy bag. Another recommendation I would give Mr. Gonzalez would be to increase the amount of soluble fiber in his diet if he experiences watery stool. Applesauce, bananas, tapioca, potatoes, rice and pasta may help with the diarrhea (Nelms, Sucher, Long 499). After about eight weeks, Mr. Gonzalez should be eating a regular diet that will meet all of his nutritional needs.

Mr. Gonzalez has a family history of heart disease so after he has fully recovered from the colostomy and has returned to living a normal life he needs to focus his eating habits around preventing heart disease. Since he is Hispanic, obese, and has a family history of heart disease, he has a very high chance of getting heart disease. I would suggest that he eat a diet low in saturated fat and cholesterol while encouraging fruits, vegetables, and fiber. Eating plenty of poultry, egg whites, fish and dairy will provide all of his protein needs while displacing the saturated fat and cholesterol that comes from red

meat. I would suggest he try to displace or substitute high fat foods like cheese, oil, cream, fried foods, and butter with healthier, low fat alternatives like margarine, baked foods, monounsaturated oils, and fat free dairy products. He should also try to consume as much Omega 3 foods as he possibly can because Omega 3 fatty acids decrease inflammation and blood clotting and can lower his risk for heart disease. Omega 3's can be found in salmon, flaxseed oil, walnuts, canola oil and many more food sources. Exercise will be important both to reduce his weight and his risk of heart disease. Since Mr. Gonzalez lives alone, I would recommend that he find a partner to work out with. I would also suggest that he try to get together with family and friends during mealtime so they can help encourage him to eat healthy and stay on the right track. I think that with proper education, Mr. Gonzalez will be prepared to take care of his colostomy and take the necessary steps to lower his risk of heart disease. Other than a few setbacks, Mr. Gonzalez has a clean medical history which is an encouraging sign for a healthy and bright future.

VI. References

"Diverticulosis and Diverticulitis". NDDIC. July 2008. 21 October 2008 < http://digestive.niddk.nih.gov/ddiseases/pubs/diverticulosis/>.

"Lisinopril". 21 October 2008. <http://www.medicinenet.com/lisinopril-oral/article.htm>.

Nelms, Marcia, Kathryn Sucher, Sara Long. Nutrition Therapy and Pathophysiology. Belmont, CA: Thomas Higher Education, 2007.

Pagana, Kathleen, Timothy Pagana. Diagnostic and Laboratory Test Reference. 8th edition. St. Louis, Missouri: Mosby Elsevier, 2007.

"Prevalence and Incidence of Diverticular Disease". 7 September 2007. 21 October 2008 <http://www.cureresearch.com/d/diverticular_disease/prevalence.htm>.

Pronsky, Zaneta. Food Medication Interactions. 14th edition. Birchrunville, PA: Food-Medication Interactions, 2006.