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FNES 365

Case Study – Meredith Dewietz

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All questions must be referenced using APA or AMA style.

1. The patient recently had a duodenal ulcer. How may have this contributed to her current condition?

A duodenal ulcer is caused by increased acid secretion throughout the day with decreased bicarbonate secretion. It occurs by the duodenal bulb (below the pylorus). Gastric outlet obstruction is common (Mahan & Raymond, 2017, p.518). Another common symptom is abdominal discomfort (Mahan & Raymond, 2017, p.516). It is important to evaluate vitamin B12 status in those with atrophic gastritis because the lack of intrinsic factor and gastric acid results in malabsorption of vitamin B12 (Mahan & Raymond, 2017, p.519). The duodenal ulcer likely caused her vitamin B12 deficiency.

2. The patient complains of tingling in her hands and feet (peripheral neuropathy). Describe the pathophysiology of why this is occurring.

Peripheral neuropathy is caused by damage to the nerves outside the spinal cord and brain. Symptoms of peripheral neuropathy include numbness, weakness, tingling, and burning pain, often in the hands, arms, feet, and legs (Byrd-Bredbenner, 2019, p.450). Peripheral neuropathy can be caused by a vitamin B12 deficiency (Westfal, 2018). A lack of vitamin B12 damages the myelin sheath that surrounds and protects nerves. When the myelin sheath is damaged, the nerves do not function properly causing conditions such as peripheral neuropathy (Foundation for PN, 2016).

3. The physician noted the patient's B12 deficiency may be due to pernicious anemia or decreased intake. What is pernicious anemia? Can it be treated nutritionally?

Pernicious anemia is a megaloblastic, macrocytic anemia that is caused by a deficiency of vitamin B12, usually from a lack of intrinsic factor that is required for vitamin B12

absorption. B12 malabsorption is caused by various stomach intestinal problems and the use of some medications. It can also be caused by a very low intake of animal foods (Byrd-Bredbenner, 2019, p.473). Vitamin B12 anemia occurs in strict vegetarians whose diet contains minimal vitamin B12 and in those who have an antibody to IF in saliva or gastric juice, small intestinal disorders affecting the ileum, certain drugs, and long-term ingestion of alcohol or calcium chelating agents. B12 deficiency is also associated with aging. Approximately 1-2% of the US population over the age of 51 has a clinical B12 deficiency (Mahan & Raymond, 2017, p.641). Eating foods high in vitamin B12 can help prevent pernicious anemia, but once the damage is done pernicious anemia cannot be treated nutritionally. Pernicious anemia is usually treated by an intramuscular or subcutaneous injection of 100 mcg or more of vitamin B12 once a week. The frequency of these injections is reduced once remission can be maintained with monthly injections. Very large oral doses of vitamin B12- 1000 mcg daily- are also effective (Mahan & Raymond, 2017, p.642).

4. Discuss pertinent medications and any food-drug interactions for THIS patient.
 - The patient is taking Zestril (Lisinopril) 40 mg p.o. daily. This medication is an ACE inhibitor agent. This drug may cause abdominal pain, constipation, or diarrhea. Possible food-drug interactions to warn the patient about include caution with a high potassium supplement or diet. Salt substitutions and natural licorice should be avoided. Ensure that the patient is getting adequate fluid intake. Alcohol should be limited (Mahan & Raymond, 2017, p.1006).
 - The patient is taking Plavix (Clopidogrel) 75 mg p.o. daily. This medication is an antiplatelet agent. This drug may cause dyspepsia, vomiting, nausea, constipation, diarrhea, abdominal pain, and/or GI bleeding/hemorrhage. Food-drug interactions of this medication to warn this patient about include increased food bioavailability. This medicine should be taken with food if GI distress occurs. Grapefruit and related citrus should be avoided. Make sure to replace fluids and electrolytes for diarrhea (Mahan & Raymond, 2017, p.1004). It is especially important that this patient takes her medication with food because of her duodenal ulcer, which causes GI distress.

- This patient is taking Norvasc (Amlodipine) 5 mg p.o. daily. This medication is a calcium channel blocking agent. This drug can cause dysphagia, nausea, cramps and edema. Possible food-drug interactions with this medication to warn the patient about include avoiding natural licorice and reducing sodium intake. If there is GI distress, take the medication with food (Mahan & Raymond, 2017, p.1006). This is especially important for this patient because of her GI distress caused by her duodenal ulcer.
- The patient is taking hydrochlorothiazide (Aldactazide) 50 mg p.o. daily. This medication is a thiazide diuretic. This drug causes an increase in urinary excretion of sodium, potassium and magnesium. It also causes an increase in renal absorption of calcium. Long-term use can lead to an increase in urinary zinc excretion. While taking this drug, the patient should maintain a diet high in zinc, magnesium and potassium. Possible food-drug interactions to warn the patient about include avoiding natural licorice as it may counteract the diuretic effect of the drug. Monitor electrolytes and supplement as needed. Caution should be used with calcium supplements (Mahan & Raymond, 2017, p.1007).
- The patient is taking potassium chloride (Klor-Con) 40 mEq p.o. daily. This medication is used to treat hypokalemia. This drug can cause lesions of the gastrointestinal tract, especially if used for long periods. Regarding food-drug interactions, the patient should be counseled to take this medication with a full meal and a glass of water or another liquid (DailyMed, 2018). It's important to ensure the patient understands she needs to eat with this medication.
- The patient is taking hydrocodone (Lortab) 500 p.o. q.4-6 h. p.r.n. This drug is an opioid. It should not be crushed before taking (Mahan & Raymond, 2017, p.1007). This medication should be used with caution in the elderly and should not be taken with alcohol (DailyMed, 2015).
- The patient is taking Colace 100 mg p.o. b.i.d. This medication is a stool softener and stimulant laxative. Side effects include bloating, cramping, and diarrhea. The food-drug interaction to warn the patient about is that this medication should not be taken with mineral oil (DailyMed, 2018).
- The patient is being given cyanocobalamin (vitamin B12) 1mg/mL. This medication is used to treat a lack of vitamin B12. It is injected right into the blood stream. Side

effects include diarrhea, muscle weakness, confusion, fast heartbeat, tiredness, headaches, dizziness, etc. There are no food-drug interactions with this medication. The patient can follow their normal diet (MedlinePlus, 2010).

5. Discuss any abnormal lab values and possible etiology of abnormal values for THIS patient.
- The patient has high methylmalonate. This is an indicator of B12 deficiency anemia (Mahan & Raymond, 2017, p.638). In metabolism, B12 converts methylmalonyl-coA to succinyl-coA. When there isn't enough B12 in the body, concentration of MMA increases. Therefore, elevated MMA levels are an indicator of a vitamin B12 deficiency (Lab Tests Online, 2018). We know that the patient has a B12 deficiency, so high methylmalonate values make sense.
 - The patient has high BUN. BUN increases in those with renal disease and excessive protein catabolism and overhydration (Westfal, 2018). BUN levels suggested impaired kidney function. BUN levels can also be an indicator of GI bleeding. (Lab Tests Online, 2018). The patient has a lot of GI issues including a duodenal ulcer, Schatzki ring and a hiatal hernia, so it is possible that she has high BUN because of these conditions. The high BUN can also be caused by inadequate fluid intake.
 - The patient has high serum sodium. This test reflects the relationship between total body sodium and extracellular fluid volume as well as the balance between dietary intake and renal excretory function. Levels are increased in those with dehydration (Westfal, 2018). We know that the patient has had a decreased appetite and is sometimes too tired to eat, so the lack of food can be causing her high sodium levels. The high sodium levels can also be caused by inadequate fluid intake.
 - The patient has low hemoglobin. Hemoglobin is decreased in those with nutritional deficits, hemorrhage, hemolysis, genetic aberrations, marrow failure, renal disease, or taking certain drugs (Westfal, 2018). The patient's low hemoglobin is likely correlated with her anemia.
 - The patient has low hematocrit. Hematocrit is decreased in those with nutritional deficits, hemorrhage, hemolysis, genetic aberrations, marrow failure, renal disease, or

- taking certain drugs. It is also somewhat affected by hydration status (Westfal, 2018). The patient's low hematocrit is likely correlated with her anemia.
- The patient has high MCV. MCV is increased in the presence of a vitamin B12 or folate deficiency and genetic defects in DNA synthesis (Westfal, 2018). The patient likely has high MCV because of her vitamin B12 deficiency.
 - The patient has a low platelet count (thrombocytopenia). This can be a genetic condition. It can also occur if the body does not make enough platelets or makes enough but destroys them or uses them up. It can also be caused by cancer. Other causes include medications, such as diuretics. Heavy alcohol drinkers who don't get enough vitamin B12 can also have low platelet counts (NLHBI, 2019). It is possible that the patient has a low platelet count because of the hydrochlorothiazide she is taking. Another possibility is that she is a heavy alcohol drinker who kept her addiction from Dr. Chamberlain, and that along with her B12 deficiency is causing a low platelet count. The low platelet count is likely associated with her anemia.
 - The patient has a low WBC. WBC is decreased in those with stress, malnutrition, autoimmune diseases, or overwhelming infections who are receiving chemotherapy or radiation therapy (Westfal 2018). She likely has low WBC because of the stress on her body.
6. Calculate the following and provide a classification for each: IBW, %IBW, BMI, UBW, %UBW, and % weight change if applicable.
- a. IBW- first 5ft = 100 lbs, add 5 lbs/inch over (Westfal, 2018)

$$IBW = 100 \text{ lbs} + 5(1in) = 105 \text{ lbs}$$
 - b. % IBW = $\frac{ABW}{IBW} \times 100$ (Westfal, 2018)

$$\% IBW = \frac{114}{105} \times 100 = 109\%, \text{ which is classified as no risk (Westfal, 2018)}$$
 - c. BMI = $\frac{weight}{(height)^2} \times 703$ (Westfal, 2018)

$$BMI = \frac{114}{(61)^2} \times 703 = 21.5, \text{ which is classified as normal (Westfal, 2018)}$$
 - d. UBW is n/a, because the patient does not think she has had any weight change (Chamberlain, 2017)
 - e. %UBW is n/a

- f. % BWL is n/a
7. Calculate the patient's energy, protein, and fluid needs. Explain your rationale for each (why did you choose that estimated energy formula/amount/range).
- Energy: I used the rule of thumb for normal weight with mild stress which is 30-35 kcal/kg of IBW to calculate the patient's energy needs. The patient's IBW is 105 lbs which is equivalent to 48 kg. Her energy = 30 x 48 thru 35 x 48 = 1440-1680 kcal/day. I chose to use the rule of thumb because it is used in a practical setting as a quick calculation that can be made easily on the spot. I chose this range because the patient has mild stress on her body, likely caused by her duodenal ulcer and whatever is causing her other symptoms (Westfal, 2018).
- Protein: I decided the patient should have 1.0-1.5 g/kg/day of protein, which comes out to 48-72 g/day. I chose to use these numbers because the patient has stress on her body and is elderly with a range of medical problems. I am calculating using her IBW (Westfal, 2018).
- Fluid needs: the general rule of fluid needs is 1 ml/kcal (Westfal, 2018), so the patient would need 1440-1680 ml of fluid/day. I chose to use this rule because similar to the rule of thumb, it's a quick and easy way to calculate fluid needs on the spot.
8. From the NCP terminology, provide a nutrition diagnosis with a complete PES statement.
- Predicted inadequate energy intake related to decreased appetite and being too tired to eat as evidenced by megaloblastic anemia and vitamin B12 deficiency.
9. For each PES statement, provide an intervention(s). You must use NCP terminology.
- The patient should have increased energy diet, increased protein diet, and increased vitamin B12 diet. The patient should be prescribed an appetite stimulant. The patient should receive medical food supplement therapy- a modified beverage to provide calories and protein. The patient should also receive vitamin B12 supplement therapy. Refer to community agencies/programs to ensure the patient is receiving enough food. Refer to an RD for the patient to follow up with.

10. Use the NCP terminology, and then describe what you will monitor and evaluate.

Food and nutrient intake:

- Total energy estimated intake in 24 hours- didn't have a food recall, go through food record or 24-hour recall with patient to estimate what she is actually eating. Patient will aim to meet minimum of 1440 calories daily.
- Types of food/meals- go through 24-hour recall/food record, see the breakdown of what the patient is eating. Patient will try to eat protein at least three times a day.
- Food variety- go through 24-hour recall/food record, see the breakdown of what the patient is eating. Patient will eat at least one animal protein a day.
- Total protein from diet- calculate using 24-hour recall/food record, see if patient is meeting estimated protein needs. Increase protein as necessary. Patient will include animal proteins. On days where she is not hungry, patient will drink Ensure.
- Vitamin B12 estimated intake 24 hours- calculate using 24-hour recall/food record, see how many animal products the patient is eating a day. Work with total protein from diet and increase both; patient will begin to eat more animal protein.
- General, healthful diet order- go through a typical day with patient, see what she usually eats and where/what she can add more of. Patient will include a modified drink (such as Ensure) to supplement with to eat more calories. Patient knows that it's important to eat, no matter what it is.
- Eating environment locations and atmosphere- patient lives at home, recommended that she goes to community center to eat meals. Patient will begin to eat out of the home and see if that helps
- Patient fatigue during feeding process resulting in inadequate intake- patient claims she is sometimes too tired to eat. As discussed, the patient will not only sit down for structured meals. She will keep a protein drink with her and take sips throughout the day to up her caloric intake.
- Nutrition quality of life responses- patient is older, so quantity is more important than quality. Patient will eat foods she enjoys throughout the day.

Anthropometric measurements:

- Measured weight- measure the patient's weight at next visit to make sure she is not losing weight

Biochemical data, medical tests and procedures:

- Electrolyte and renal profile- aim to be WNL in the next 3 months
- Nutritional anemia profile- aim to be WNL in the next year

Nutrition focused physical findings:

- Pale complexion- most likely due to anemia, monitor as B12 levels improve
- Tingling of foot- should go away with B12 therapy, monitor to make sure it's getting better

11. Provide SMART goals for your intervention(s).

- The patient will eat a serving of animal protein with dinner at least four times this week.

12. Complete and submit the ADIME note from EHR go.

13. Each question should be referenced correctly within the answer and a complete reference list provided at the end of the case. AMA or APA style may be used.

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