Leukemia Case Study

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1. Discuss the significance of Nicole's laboratory findings
    a. All of her laboratory values are low. According to Ball, Bindler & Cowen (2010), a hemoglobin level less than 10 g/dL and a low white blood cell count are the usual findings in a person diagnosed with leukemia. Her platelet count, hematocrit and neutrophils are also low due to her diagnosis. All of these levels are low because she is on chemotherapy, which destroy the cancerous cells and the normal cells within the body.
2. What other assessment data would be helpful for the nurse to have to prepare Nicole's care plan?
    a. It would be helpful to the nurse if she knew the types of medications that Nicole takes at home, especially the type of chemotherapy that she usually receives and the dosage, and the type of infection that was present in her central line (if it was a bacteria or virus).
3. What are the priorities of care for Nicole on admission?
    a. Since Nicole is not experiencing any pain, the biggest priority is to get her temperature back to a normal level. This would include administering prescribed medications for temperature elevation and administering the prescribed medications to treat the infection in her central line.
4. Discuss the common complications (adverse effects) of chemotherapy.
    a. Chemotherapy can cause many adverse effects in patients. Chemotherapy is designed to kill rapidly growing cells, like skin and hair, but can also affect mucus membranes, the reproductive system and the GI tract. Common side effects are

abnormal laboratory values, loss of appetite, fatigue, nausea and vomiting, constipation, pain, diarrhea, stomatitis, hair loss and infertility (Kee & Hayes, 2009, pp. 530-534).

5. What nursing actions address the adverse effects associated with chemotherapy?
    a. It is important to assess the patient for fatigue, shortness of breath, mental status changes and vital signs including blood pressure, heart rate and respirations. The nurse should also assess for infections, pain, diarrhea, constipation, nausea and vomiting, intake and output, mucosal changes and hair loss. It is important to elevate the head of the bed and provide oxygen as needed to ease breathing, teach proper hand washing to prevent infections, plan for rest periods throughout the day so the patient does not become too fatigued and provide antiemetics. The nurse should teach the patient about proper mouth care and to avoid very hot or cold drinks and eat small meals and follow a low spicy, fatty, salty food diet with whole grains and fruits and vegetables, to report nosebleeds, temperature elevations and to teach the signs and symptoms of infection (Kee & Hayes, 2009, p. 534).
6. Discuss cyclophosphamide including any nursing interventions necessary specifically related to its use.
    a. Cyclophosphamide is an antineoplastic, immunosuppressant agent used to treat many different kinds of cancers. Its action is to interfere with DNA replication and to disrupt protein synthesis in cells. It is used in patients with cancer because it kills rapidly replicating cells. It is important to prepare this medication wearing gloves, a gown and a mask, to give this medication, the patient should have an

empty stomach and the nurse should encourage the patient to drink a lot of fluids. The nurse should monitor blood pressure, respirations and temperature, urinary output, assess for bleeding, fatigue, dyspnea, crackles, orthostatic hypotension, nausea and vomiting, signs of infection and assess for weight gain or edema (Deglin & Vallerand, 2009).

7. Discuss how CVAD line infections occur and why.
    a. Infections through central venous lines are very common. Risk factors are usually associated with prolonged hospitalization and related to the device itself, the technique that was used when the device was put into place, the site of insertion and how long the catheter is to be in for. Others include immunosuppressive therapy and the type of the illness. "Catheter-related infections and bacteremias are usually caused by microorganisms found on the client's skin or on the hands of healthcare workers. These microorganisms invade disrupted tissue and migrate around the site of insertion and along the device into the intravascular space" (Black & Hawk, 2010, p. 329). This is why it is important to use good hand washing techniques and to make sure no organisms can enter into the bloodstream while cleaning and handling the site with aseptic technique. The nurse should reinforce this with Nicole and her parents. There should be a semipermeable dressing over the site and changes should be done on a regular basis.
8. Discuss your impressions about Nicole's mother's statements, considering Nicole's level of growth and development.
    a. Nicole's mother stated that she seems down since receiving chemotherapy and is refusing to see her friends. I believe that Nicole could possibly be experiencing

depression and the nurse should talk to her about this. If the nurse believes she is depressed, she should report this so Nicole can have a consult and can receive treatment for this. On the other hand, Nicole may just be feeling self-conscious about losing her hair and her overall appearance. She continues to talk with her friends, but she may not want them to see her because she might think that they may feel uncomfortable seeing her. The nurse could possibly discuss with Nicole and her mother why she does not want to see her friends and even discuss the possibility of buying a wig if that would make Nicole feel more comfortable.

9. Discuss your impressions about Nicole's complaints and the appropriate nursing actions to help Nicole.
    a. Nicole states that her mouth and throat are sore and she cannot eat or drink. On admission, she was diagnosed with stomatitis. This is characterized by inflammation of the mucosal lining in the mouth. It is important that the pain be reduced with analgesics or topical anesthetics, to treat the infection with medications, keep the mouth clean and to avoid hot, cold, spicy, or citrus foods, to eat soft foods and take nutritional supplements so growth and development is not affected since Nicole is not eating as well as she should (Black & Hawks, 2009, p. 294).
10. Discuss the medications Nicole was prescribed and if the doses are safe.
    a. Ordered medications: Gentamicin sulfate 100 mg IV q8h, vancomycin hydrochloride 500 mg IV q6h, and cefoxitin sodium 1 g IV q6h; Nicole weighs 88 lbs or 40 kg

b. Gentamicin (anti-infective/aminoglycoside)-action is to inhibit protein synthesis in bacteria; it treats gram-negative bacteria and infections caused by staphylococci; normal dosage is IM/IV (for children >5 years) 2-2.5 mg/kg/dose q8h (normal is 2 mg x 40 kg = 80 mg to 2.5 x 40 kg = 100 mg) Nicole was prescribed 100 mg, which is a safe dose

c. Vancomycin (anti-infective)- the action is to bind to the bacterial cell wall to result in cell death; it treats gram-positive pathogens like staphylococci and streptococci; normal dosage is IV (for children > 1 mo) 40 mg/kg/day divided q 6-8 hr-maximum dose is 1g/day or IV (adults) 500 mg q6h (normal is 40 mg x 40 kg = 1600 mg which is **not** a safe dose) (the adult dosage is a safe dosage).

d. Cefoxitin (anti-infective)- it's action is to bind to bacterial cell wall and cause death; it is similar to first generation cephalosporins, but kills additional gram-negative pathogens; normal dose is IM/IV (for children > 3 mo) 20-40 mg/kg q6h or IM/IV (adults) 1 g q6-8h (normal dose is 20 mg x 40 kg = 800 mg to 40 mg x 40 kg = 1600 mg); Nicole was prescribed 1 g q6h which is a safe dosage.

11. Discuss this medication schedule and what alterations the nurse should make, if any.

a. Gentamicin 2400 0600 1200 1800

b. Vancomycin 0200 0800 1400 2200

c. Cefoxitin 2400 0600 1200 1800

d. Gentamicin and Cefoxitin should not be administered together because Cefoxitin causes nephrotoxicity when used with aminoglycosides.

12. Calculate the rates of administration via a volumetric infusion pump

a. Gentamicin sulfate 100 mg in 100 mL of 5% dextrose in water to infuse over 30 minutes= set pump at 200mL/hr
b. Vancomycin hydrochloride 500 mg in 250 mL of 0.9 % NS= cannot calculate this because no infusion rate was provided
c. Cefoxitin sodium 1 g in 50 mL of 5% dextrose in water to infuse over 15 minutes= set pump at 200 mL/hr

References

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