321 W10 Fluid and Electrolyte Case Study

Your Name

Institution

Fluid and Electrolyte

**Case Study**

Case: A 65-year-old female is admitted to your unit complaining of nausea, vomiting, and diarrhea for the past three days. Her history is unremarkable except hypertension, for which she takes hydrochlorothiazide. She relates feeling exhausted and having leg cramps which interfere with her sleeping. Notable assessment findings include T. 38.6 C, AP 102 and irregular, B.P. 90/50; absent bowel tones, poor muscle tone, and skin turgor.

**Laboratory data includes:**

K+ 2.9 mEq/L, Na+ 137 mEq/L, Cl- 97 mEq/L, and WBC 20,000/ul.

ECG shows irregular heart rate

**Physician's orders include:**

• IV D50.9%NaCl with 20 mEq KCl/L to infuse at 90cc/hr.

• 40 mEq of KCl IV over the next 2 hours

• K+ level 30 minutes after 40 mEq IV KCl has infused

• Bedrest: May use bathroom

• NPO

**Questions**

1. What fluid and/or electrolyte disturbances does this client have?

According to the client's laboratory result, her potassium level is 2.9 mEq/L, sodium level is 137 mEq/L, chloride level is 97 mEq/L, and the white blood cell count is 20,000/ul. The client has hypokalemia and hypovolemia. Hypokalemia is a medical condition in which potassium level in a patient's blood drops. The normal range of potassium in the blood is 2.5 to 5.0 mEq/L, and the potassium level in this patient is 2.9mEq/L. Hypovolemia is a condition in which the patient’s blood volume is lower than average. Normal number of white blood count is 4,500 to 10,000. According to the laboratory's result, the white blood cell count in the patient is 20,000/ul, this number is higher than the normal range.

2. Which electrolyte disturbance is of most concern with this client?

Potassium level in the patient's body is very low as per normal level. Hypokalemia disturbance is of most concern with this client. In hypokalemia, the potassium level in the blood of a person falls lower than normal.

3. Underline the signs and symptoms that can result from this electrolyte disturbance

* Hypokalemia can make muscles feel, twitch, weak, or even paralyzed
* Hypokalemia may also cause digestive problems, due to low potassium level brain does not send relay signals to digestive system muscles.
* Poor digestion system also cause absent bowel tones
* Low potassion may result in a faster and harder beating of the heart. In this case, the Apical pulse of the patient is 102
* Hypokalemia may also cause muscles to ache and stiff
* Low potassium level can make the patient feel numbness and tingling in his/her feet, arms, and legs
* Patients with hypokalemia are often tired and exhausted.
* Hypokalemia also cause the skin to tugor because of excessive diarrhea
* Potassium also helps the brain to send signals to the lungs; these signals helps in the contraction and expansion of the lungs (Gennari, 1998). Low potassium level may also cause difficulty in breathing. As a result, the heart beats faster and harder.
* Low potassium level, along with difficulty in breathing results in irregular heart rate.

4. What do you suspect as the cause(s) of this electrolyte disturbance?

There can be various factors that can cause hypokalemia in a patient. According to this case study, excessive vomiting can be a cause of hypokalemia in this patient. Moreover, potassium wasting diuretic therapy and no replacement for potassium in her body can also be the cause of hypokalemia. In addition to vomiting, excessive diarrhea may also cause hypokalemia (Gennari, 1998). Chronic kidney disease can also cause the potassium level in the blood of a patient to drop. Low level of folic acid in women be the reason for hypokalemia. Excessive alcohol usage can also become a reason for potassium level to drop in blood.

5. What type of solution is D5NS with 20mEq KCl/L?

D5NS is a hypertonic solution suggested by the physician for treating a client's hypokalemia. D5NS is a hypertonic solution with a high quantity of solute (potassium) in it. This hypertonic with a large quantity of potassium is given to the patient because of her low potassium level. Frequent dosage of hypertonic solution can increase the overall potassium level in a patient’s blood (PF Moon, 1995). The hypertonic solution will cause the symptoms of hypokalemia to lesse with time.

6. Would you question any of these orders? Why?

Yes, I would question the physician’s order. The physician has ordered to give hypertonic solution (IV D50 9 percent Sodium chloride with 20mEq KCl/L), and 40 mEq of potassium chloride is administered after 2 hours of giving the hypertonic solution. Although 40mEq is a high value of potassium, this does not specify the level of potassium to dilute in the fluid. 2 hours is not enough to evaluate the potassium level in a patient’s body (Weisberg, 2008).

7. List safe administration principles for IV potassium

Always follow the policies of an organization regarding the hypertonic dosage. Listed administrative principles/ guidelines should be followed by health care personnel for injecting hypertonic solutions.

* Frequently administer the potassium level in the blood of the patient.
* Do not completely rely on IV push as it will be dangerous for patient’s health
* Do no dilute an excessive amount of potassium in a fluid.
* Follow standards for the recommended amount of KCl to be used
* Don't give a high amount of hypertonic every hour. Hypertonic should be given less than 10 mEq.hr
* Do not insert KCl directly into the container, always remove the container then add KCl. This will avoid a high concentration of KCl in the fluid.
* Always use an infusion pump

# References

García-Palmieri, M. (1962). Reversal of hyperkalemic cardiotoxicity with hypertonic saline. *American heart journal*.

Gennari, F. (1998). Hypokalemia. *New England Journal of Medicine*.

PF Moon, G. K. (1995). Hypertonic saline-dextran resuscitation from hemorrhagic shock induces transient mixed acidosis. *Critical care medicine*.

Weisberg, L. (2008). Management of severe hyperkalemia. *Critical care medicine*.