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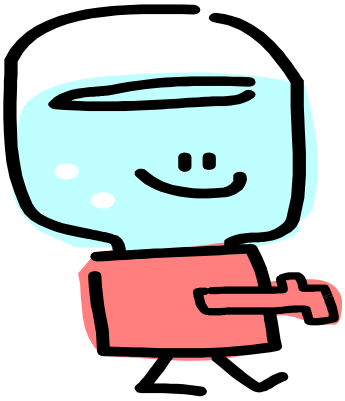
KENT STATE UNIVERSITY
HEALTH CARE OF CHILDREN
Nursing 30020 - Pediatrics
Case Studies: Child Dehydration

Introduction: Dehydration can be life threatening to a child since a majority of their body composition is made up of water. Large losses of water must be replaced in as soon as possible.



Objectives:
After completing this session the student will be able to:

- Identify signs/symptoms of dehydration.
- Describe the signs that differentiate dehydration between mild, moderate, or severe dehydration.
- Discuss possible nursing diagnoses for the dehydrated child.
- Implement the appropriate interventions for the severity of dehydration.
- Evaluate the care of a pediatric patient with dehydration.

Critical Thinking Exercises:

1. Terry, age 5, has been vomiting for the past 12 hours. Should the mother attempt to give this child fluid, why or why not? Please give rationale to support your answer.
   - No, because she will most likely keep throwing up. This could be a severe case of dehydration which means she should go to the hospital so she could get fluids and hydrated through an IV, or get Phenergan to make her stop vomiting so she can take fluids orally.

2. The mother in the above situation tells you Terry has also exhibited some bouts of diarrhea. She has been attempting to give him a coke since this is all he is asking for at this time. Do you think the mother needs education on the types of fluids to give or is her choice appropriate? Please give rationale to support your answer.
   - Yes, because coke contains a lot of sugar. Sugar does facilitate the absorption of sodium in oral rehydration fluids, but if the oral rehydration fluid is too concentrated, like coke, it can worsen diarrhea. She needs more education so she knows this. Coke is highly concentrated and needs to be diluted to half strength when given to a child with diarrhea.

3. What lab values would be good to assess in a child with dehydration? List the specific labs and rationale for you assessing these specifically.
   - Sodium concentration. Rationale: if elevated, brain shrinkage and decreased LOC can occur. If decreased, fluid would shift from the extracellular to intracellular components leading to an even greater extracellular dehydration.
   - Serum electrolyte panel (Na, K, Cl, Bicarbonate, Creatinine, Glucose). Rationale: can reflect imbalances in water and electrolyte values. They provide the basis for further assessment and diagnosis of the condition and for the types of fluids needed during management to reestablish balance.
   - BUN. Rationale: if elevated (<17mg/dL) and Sodium Bicarbonate is decreased (>17mEq/L) it is an indicator of moderate and severe diarrhea.
   - Arterial Blood gases. Rationale: can be analyzed for pH, partial pressure of oxygen, partial pressure of carbon dioxide, and serum bicarbonate. Levels are analyzed for information about acid-base balance.
   - Urine specific gravity. Rationale: used to assess the concentration, an increasing number indicates higher concentration of molecules, signifying lower levels of hydration.

4. The dehydrated child weighs 75 lbs (34.09 kg). The doctor orders 2500ml of 0.9% normal saline solution. What is your opinion about the type and amount of solution for a child that weights 75 pounds?
   - First 1-10kg = 100mL/kg/24 hr = 10 x 100 = 1000 mL
   - 11-20 kg = 50mL/kg/24 hr = 10 x 50 = 500 mL
   - Each kg after 20 = 20mL/kg/24 hr = 14 x 20 = 280 mL (1000+500+280=1780)
   - IV needs for Terry weighing 34 kg = 1780 mL/24 hrs
     - I think the doctor ordered too much fluid based on his weight. I think the type of solution that was ordered is fine because it will restore the water and sodium that has been lost and also maintain sodium and chloride levels.

5. What nursing interventions would you institute for a child in dehydration? Be specific so other healthcare personnel would be able to follow you interventions on other shifts. Give rationale to support each intervention.
   - Fluid management:
     - Monitor weight daily, using the same scale, and with no clothes on the child. Assess intake and output of every shift. Assess the heart rate, postural blood pressure, skin turgor, capillary refill time, fontanel (infant), and urine specific gravity every 4 hours or more frequently as indicated. Rationale: Frequent assessment of hydration status facilitates rapid intervention and evaluation of the effectiveness of fluid replacement.
     - Administer IV fluids as ordered. Monitor for crackles in dependent portions of the lungs. Rationale: Replace fluid lost from the body. Excessive replacement of sodium containing fluids could cause extracellular fluid volume excess.

- Fall Prevention:
    - Raise the side rails of the bed. Ensure that a small child does not become tangled in bed covers. Rationale: Safety measures protect the child
    - Monitor LOC every 2-4 hours or more often as indicated. Rationale: Frequent assessment provides evidence of the need for safety interventions and of the effectiveness of therapy.
    - Monitor serum sodium concentration daily or more often. Rationale: Elevated serum sodium concentration causes brain cell shrinkage and decreased LOC.
    - Have the child sit before rising from bed and assist to stand slowly. Rationale: Reduces dizziness or feelings of light-headed from decreased blood volume.

6. What home care teaching or discharge planning would you do prior to a child in dehydration going home?
    - Encourage breastfeeding b/c it is associated with a decreased incidence of gastroenteritis
    - Encourage all parents to keep oral rehydration fluids at home in case they are ever needed
    - Educate them about the need for increasing fluids in hot weather and during exercise
    - Reinforce safety teaching to decrease incidence of burns (important cause of dehydration)
    - Teach the S&S of vomiting and diarrhea so parents recognize these problems accurately
    - Give parents instructions about types of fluids and amounts to encourage
    - Teach the signs of dehydration that parents can recognize such as increasing lethargy, dry mucous membranes, decreased urine output, increased thirst, and anorexia, and letting parents know to seek help immediately when these symptoms occur.
    - Emphasize that the newborn and infant are at highest risk and that prompt care is needed if dehydration persists.
    - Instruct parents to begin the child's normal diet once hydration is complete, determined by adequate urinary output and normal behaviors
    - Review methods of minimizing the child's chance of acquiring GI infections (avoiding contact with other children who are infected, using careful handwashing and dishwashing procedures when a child in the home is affected)

7. What nursing **outcomes** would you like to see demonstrated by a child in dehydration?
    - Fluid Balance: Balance of water in extracellular and intracellular components of the body
        - **The child has signs of normal hydration**
    - Fall prevention: Minimize risk factors that precipitate falls
        - **The child does not fall or suffer other injury**
    - Energy Conservation: Manage energy to sustain activity
        - **The child engages in normal developmental activities and receives adequate rest**

8. Megan is 24 months old. Several days ago she developed vomiting and diarrhea. Her sister had the same problems several weeks ago. She has been taking small sips of juice but has refused to eat. This morning she has refused any attempts at eating and drinking and is lethargic. The GI symptoms continue. The mother brought Megan to the Emergency department. Upon assessing the child the following data was collected: lost 1 kg of weight (26>24.5 pounds), pulse rapid, skin turgor over abdomen is decreased, mucous membranes dry, fluctuates between lethargic and irritable, two wet diapers today with dark colored urine.

a. Is there any other assessment data you would collect? List

- Other vital signs such as blood pressure (see if it is low) and respirations (see if rapid)
- Urine output (see if decreased 1ml/kg/hr)
- Fontanel assessment (if sunken in or not)
- Capillary refill (see if delayed 3-5 seconds)
- Assess the eyes (if they are sunken in or not)

b. Which degree of dehydration would you say Megan's signs imply?

- Moderate Dehydration (6% - 9% body weight lost)
    - she lost 1 kg of weight = 8% body weight lost
    - rapid pulse
    - decreased skin turgor
    - dry mucous membranes
    - lethargic and irritable
    - dark colored urine

c. Establish a plan of care for Megan.

- Ineffective Management of Therapeutic Regimen R/T family knowledge deficit about diarrhea and vomiting
    - Goal: Parents will describe appropriate home management of fluid replacement for diarrhea and vomiting.
    - Interventions: Family involvement
        - Explain how to replace body fluid with an oral rehydration solution and encourage parents to keep the solution at home and begin use with the first sign of diarrhea. Use of an oral rehydration solution can enable successful treatment of vomiting and diarrhea at home
        - Teach the parents to continue the child's normal diet in addition to providing replacement fluids for diarrhea. Diet plus fluid supplementation leads to faster recovery.
        - Provide verbal and written instructions to parents at each well-child visit. Parents are provided with a reference for later use
    - Outcome: Parents are successfully able to treat the child's diarrhea and vomiting at home and the child is adequately hydrated.
- Deficient Knowledge R/T causes of dehydration
    - Goal: Parents will state common causes of childhood dehydration.
    - Interventions: Teaching causes of dehydration

        - Teach parents childhood conditions that commonly lead to dehydration. If parents recognize situations that can lead to dehydration, they will be more alert to its appearance
    - Outcome: Parents recognize conditions of risk for dehydration in children.
- Risk for Deficient fluid volume R/T worsening of child's condition
    - Goal: Parents will seek health care for the child's worsening condition
    - Interventions: Fluid Management
        - Teach parents to seek care when the child's vomiting or diarrhea worsens, or the child's mental alertness changes. Severe dehydration may occur if milder forms are not successfully treated.
    - Outcome: Parents seek prompt attention for the child's worsening condition, preventing the development of severe dehydration.