

Study Guide- Fluid & Electrolytes and Nutrition

Concept- Fluid & Electrolytes

Most important electrolytes- Sodium, Potassium, Calcium, and Magnesium

Normal Values

- Sodium 135-145 mEq/L
- Potassium 3.5-5 mEq/L
- Calcium 8.6-10.2 mg/dL
- Magnesium 1.5-2.5 mEq/L

Sodium affects the brain

Potassium affects the heart

Major food sources

- Sodium- canned or pickled foods, cheese, packaged, processed, store bought, and restaurant foods
- Potassium- beans, squash, yogurt, fish, avocados
- Calcium- dairy products, spinach, soy beans, white beans, salmon
- Magnesium- spinach, legumes, nuts, seeds, whole grains

Osmolality- concentration of substances in the blood- Normal Value 275-295 mOsm/kg

Types of Fluid Imbalance

- Isotonic- loss/gain of fluid and electrolytes
- Osmolar- loss/gain of fluid only

Exemplar- Extracellular Fluid Volume Excess (Hypovolemia)

Excessive intake of fluids, abnormal retention of fluids, or shift of fluid from interstitial fluid into plasma fluid.

Causes

- Excessive isotonic or hypotonic IV fluids
- Heart failure
- Renal failure
- Primary polydipsia
- SIADH
- Cushing Syndrome
- Long term use of corticosteroids

Symptoms/Assessment

- Headache, confusion, lethargy
- Peripheral edema
- JVD

- Bounding pulse, elevated BP
- Polyuria
- Dyspnea, crackles, pulmonary edema
- Muscle spasms
- Weight gain
- Seizures, coma

Interventions/Treatment

- Primary therapy- fluid restriction and diuretics
- I&O monitoring
- Daily weight monitoring
- Auscultate lung sounds
- Monitor rate of infusion and IV fluid type

Potential Complications

- Pulmonary edema
- Seizures, coma

Patient Teaching

- Low sodium diet
- Decrease fluid intake (2L/day)
- Diuretic side effects- frequent urination, take in AM to avoid nocturia

Exemplar- Extracellular Fluid Volume Deficit (Hypovolemia)

Abnormal loss of body fluids, inadequate intake, or a shift of fluid from plasma to interstitial fluid

Causes

- Elevated insensible water loss or perspiration (high fever, heat stroke)
- Diabetes Insipidus
- Osmotic diuresis
- Hemorrhage
- GI loss- diarrhea, NG suctioning, vomiting, fistula drainage
- Overuse of diuretics
- Inadequate fluid intake
- Burns
- Intestinal obstruction

Symptoms/Assessment

- Restlessness, drowsiness, confusion, lethargy
- Thirst, dry mucous membranes
- Decreased skin turgor, decreased capillary refill
- Postural hypotension, elevated pulse, weak/thread pulse
- Decreased urine output, concentrated urine
- Increased respiratory rate

- Weakness, dizziness
- Weight loss
- Seizures, coma

Interventions/Treatment

- Correct underlying cause
- Replace fluid & electrolytes
- Monitor I&O
- Daily weight monitoring
- Monitor IV infusion rates and solutions
- Give supplementary water with enteral feedings

Potential Complications

- Decreased cardiac output
- Hypovolemic shock
- Seek appropriate medical attention when sick

Exemplar- Hypo/Hyperkalemia

Hypokalemia

Causes

- GI loss- diarrhea, vomiting, fistulas, NG suction
- Renal loss- diuretics, hyperaldosteronism, magnesium depletion
- Skin loss- diaphoresis
- Dialysis
- Starvation
- Failure to include potassium in parenteral fluids if NPO

Symptoms/Assessment

- Fatigue
- Muscle weakness, leg cramps
- Nausea, vomiting, paralytic ileus
- Soft flabby muscles
- Paresthesia, decreased reflexes
- Weak, irregular pulse
- Polyuria
- Hyperglycemia
- EKG changes

Interventions/Treatment

- Oral or IV potassium chloride (KCl) and increased dietary intake of potassium
- KCl is not given unless there is urine output of at least 0.5ml/kg of body weight per hour
- If IV KCl is given, there must be continuous cardiac monitoring
- IV administration of KCl should not exceed 10mEq/hr