DISEASE

HYPONATREMIA

PATHOPHYSIOLOGY

- Develops when serum Na+ concentrations fall below 136 due to either:
  - Inadequate intake of Na+
  - Dilution of Na+ by excess water
- Na+ depletion causing hypoosmolality with movement of water into cells = cells swell!

ECF decreases ——— ICF increases

CLINICAL MANIFESTATIONS

- Vitals: hypothermia, tachycardia, rapid thready pulse, hypotension, orthostatic hypotension, diminished peripheral pulses
- Neuromusculoskeletal: headache, confusion, lethargy, muscle weakness to the point of possible respiratory compromise, fatigue, decreased deep-tendon reflexes (DTRs), seizures, lightheadedness, dizziness, cramps, personality changes, coma
- GI: increased motility, hyperactive bowel sounds, abdominal cramping, nausea
- Renal: increased urinary output
- Integumentary: dry mucous membranes

NURSING INTERVENTIONS & PATIENT TEACHING

NURSING CARE

- Encourage foods high in sodium (beef broth, tomato soup, cheeses, processed foods/meats)
- Administer IV fluids (lactated Ringer's [LR], 0.9% isotonic saline [NS])
- Restrict water intake
- Monitor I&O and daily weights
- Monitor vitals & LOC
- Seizure precautions
- Replacement of sodium should not exceed 12 mEq/L in a 24-hr period because rapid rise risks development of neurologic damage due to demyelination
- Nephrology can be consulted for electrolyte and fluid replacement
- Respiratory services can be consulted for oxygen management
- Nutritional services can be consulted for high-sodium food choices and restricting fluid intake

PATIENT EDUCATION

- Weigh daily and notify the provider if a 1- or 2-lb gain in 24-hrs or 3-lb gain in 1 week
- Consume a high-sodium diet, including reading food labels to check sodium content and keep a daily record of sodium intake

RISK FACTORS

Actual Sodium Deficits

- Excessive sweating
- Diuretics (thiazides)
- Wound drainage
- Inadequate sodium intake
- Decreased secretion of aldosterone
- Hyperlipidemia
- Kidney disease
- Low sodium diet
- Hyperglycemia

Relative Sodium Deficits due to Dilution

- SIADH
- SSRI therapy
- ACE, ARBs, beta blockers, some antibiotics
- Increased IV fluid rate of hypotonic IV fluid
- Kidney failure
- Heart failure
- Freshwater submersion accident

DIAGNOSTICS

LABORATORY TESTS

- Blood (serum) sodium: decreased, less than 136 mEq/L
- Blood (serum) osmolality: decreased (except in azotemia with toxin accumulation)
- Urine sodium: less than 20 mEq/L (in sodium loss); greater than 20 mEq/L (in SIADH)
- Urine specific gravity: decreased (1.002–1.004 in sodium loss); increased in SIADH

MEDICATIONS

If patient is experiencing severe hyponatremia, medications should be administered as prescribed.

- Conivaptan or Tolvaptan are common medications used, which promote excretion of excess fluid

IV fluids, diet changes, and restriction of water are common treatments for hyponatremia.

POSSIBLE COMPLICATIONS

SEVERE HYPONATREMIA

- Complications (coma, seizures, respiratory arrest) can result from acute hyponatremia if not treated immediately
- Nursing actions:
  - The goal is to elevate the blood sodium level enough to decrease neurologic manifestations associated with hyponatremia (lethargy, confusion, seizures)
  - Maintain an open airway, and monitor vitals
  - Implement seizure precautions, and take appropriate action if seizures occur
  - Monitor LOC
  - Administer hypertonic oral and IV fluids as prescribed
  - Administer 3% sodium chloride slowly, and monitor sodium levels frequently. When using hypertonic solutions, the blood sodium level should not be greater than 125 mEq/L
  - Administer medications as prescribed