NURS 821 Advanced Pathophysiology

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Lecture 4 Alterations in Fluid, Electrolytes, and Acid Base Balance

Fluid, Electrolyte, and Acid Base

Part 2 Disorders of Fluid Volume

Disorders of Fluid Volume

Extracellular fluid volume deficit

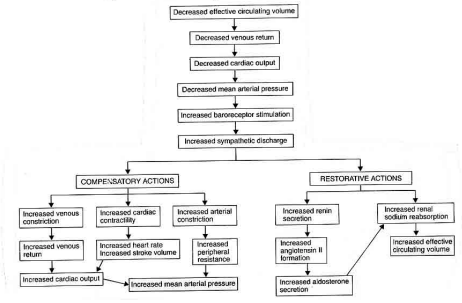
ECF Volume Regulation

- **RAA System**-stimulated by decreased RBF in baroreceptors in afferent renal arterioles
- **Renin-*R***-enzyme; splits angiotensin I from angiotensinogen
- **Angiotensin-*A***-converted to II in lungs; contracts arteriolar smooth muscle; stimulates Aldosterone release
- **Aldosterone-*A***- causes increased sodium and water absorption in renal collecting ducts

Hypovolemia

- Decreased ECF
- *Isotonic-not dehydration!*
- Etiology
  - GI losses
  - third spacing
  - diaphoresis
  - urinary losses
  - DM

Isotonic Dehydration Compensatory Mechanisms



Disorders of Fluid Volume

Extracellular fluid volume excess

ECF Volume Excess: Increased Interstitial Fluid

- Etiology: increased Na:H2O proportionately; change in Starling's forces
- Where?
  - Local
  - General
- Manifestations

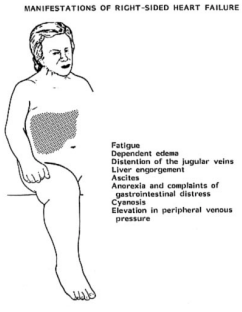
Causes of Edema

- Increased capillary hydrostatic pressure
- Decreased colloid osmotic pressure
- Increased capillary permeability
- Lymphatic obstruction
- Sodium/body water excess

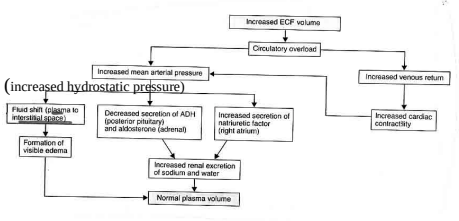
Edema

Ascites

Right Sided Congestive Heart Failure



Hypervolemia: Compensatory Effects



Water Intoxication