DIABETES INSIPIDUS

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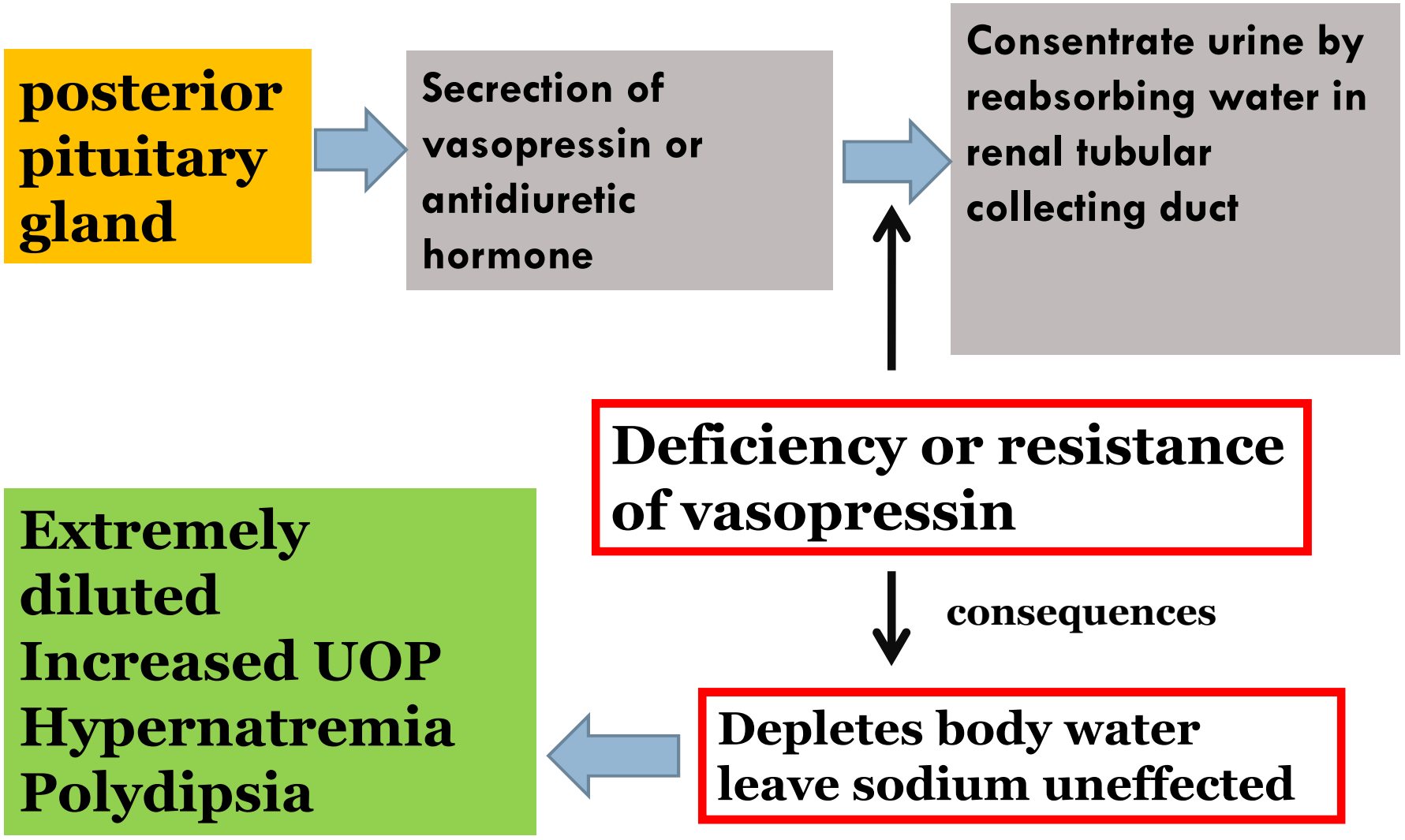
Definition

- The passing of tasteless urine because of its relatively low sodium content

- Can be autosomal dominant and autosomal recessive
- Causes:
  1. Deficiensy of vasopressin by pituitary gland **(Cetral Diabetes Insipidus)**
  2. Renal tubular unresponsiveness to vasopressin (Nephrogenic Diabetes Insipidus)
- 3 cases per 100,000 population, male:female=60:40

Pathophysiology CDI



Clinical

History

- Nonspecific presenting features in infants and children
- Earliest signs: vigorous suck with vomiting, fever without apparent cause, constipation, and excessively wet diapers from urination
- Older infants and young children: irritability, borderline state of dehydration with hypernatremia and, sometimes, fever
- Nocturia

Physical

- Irritable infant with a dripping wet diaper
- Signs of dehydration
- Hypotension may be present because of hypovolemic shock
- Mobile fecaliths

Lab studies

- Urine specific gravity of the first morning urine
- Urine serum sodium may be as high as 170 mEq/L
- Serum osmolarity >300 mOsm/kg
- Patients with prerenal azotemia present with severe dehydration

Lab studies

- The water deprivation test → normal respons
- 24-hour urine collection
- Serum potassium and calcium concentrations
- Imaging studies

Management

- Inpatient stay for the risk of dehydration
- Diet:

  infants→ breast milk, protein 6% of caloric intake, sodium reduced to 0.7 mEq/kg/d

  young children→protein 8% of caloric intake, sodium intake must be maintained at 0.7 mEq/kg/d
- Heat exposure should be minimized

Management

- Desmopressin (a synthetic vasopressin analogue)
- Chlorpropamide and thiazide diuretics. (can be used in combination with each other)
- Treatment of the main caused

SYNDROME OF INAPPROPRIATE ANTIDIURETIC HORMONE SECRETION

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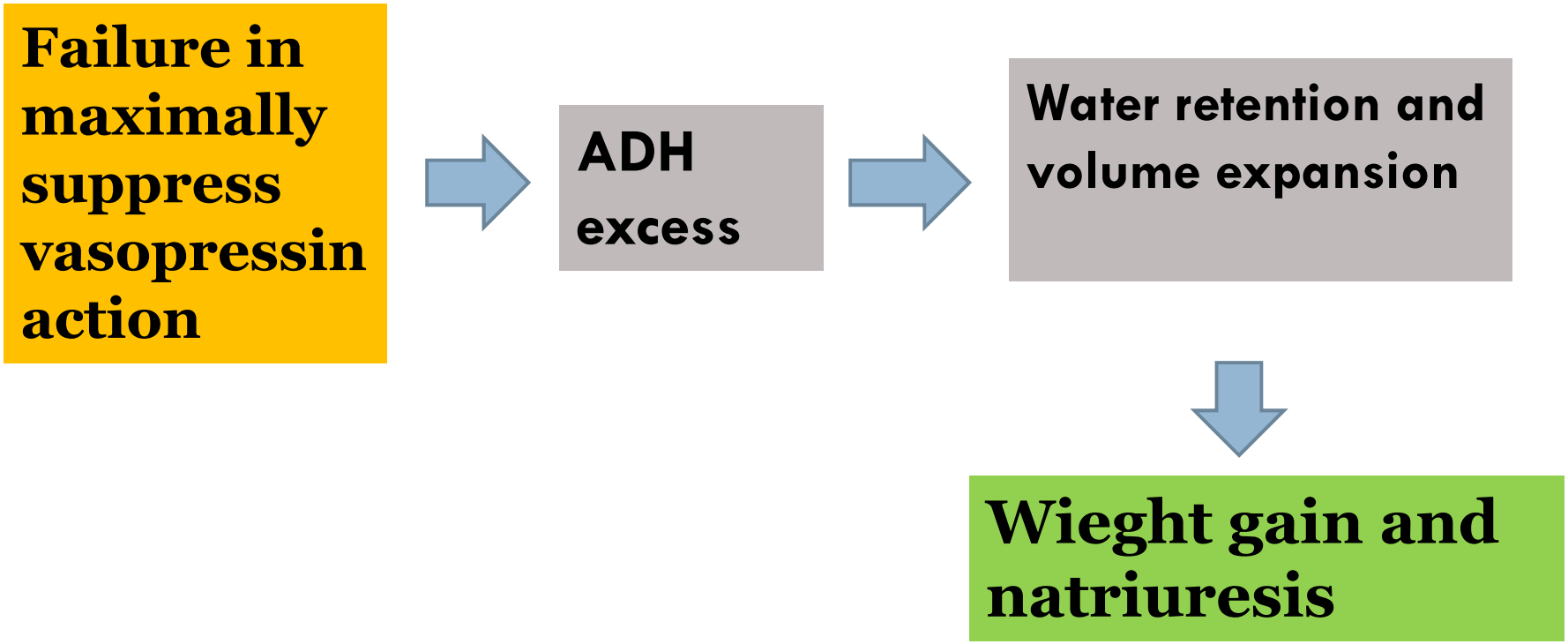
Definition

- Hyponatremia and hypoosmolality resulting from inappropriate continued secretion and/or action of antidiuretic hormone (ADH) despite normal or increased plasma volume
- Arginin vasopressin (AVP) is the naturally occurring ADH in humans
- It is synthesized in the cell bodies of neurons in the supraoptic and paraventricular nuclei of the anterior hypothalamus and travels along the supraopticohypophyseal tract into the posterior pituitary

Causes

- Nervous system disorders
- Neoplasia
- Pulmonary disorders
- AIDS
- Drugs
- others

Pathophysiology



- Serum osmolality falls below the reference range

- Natriuresis is produced by a decrease in proximal tubular sodium reabsorption secondary to the expansion of the extracellular fluid
- Hypervolemia suppresses the renin-angiotensin-aldosterone system during the water retention phase

- Sodium balance is maintained in SIADH, and the sodium output equals the intake.

Clinical

History

- Cellular swelling and cerebral edema associated with hyponatremia
- Asymptomatic if the serum osmolality remains above 240 mOsm/kg of water
- Occurs most frequently in children with central nervous system infections, intrathoracic disease, and in postoperative patients

Clinical

- Premature neonates :often accompanies brain injury , closely associated with intracranial hemorrhage
- Clinical manifestations related to the degree of hyponatremia and rate at which hyponatremia develops
- Gastrointestinal tract symptoms
- Neuropsychiatric
- Muscle cramps, muscle weakness

Physical

- Hypotonic hyponatremia without other major symptoms and in the absence of dehydration
- Volume expansion short of edema and a maximum weight gain of 8%
- Absence of a decreased blood volume

- Hypovolemia, hypotension, and overt signs of hypervolemia are absent
- Deep tendon reflexes are depressed
- Pathologic reflexes, asymmetric pupils, abnormal sensorium, pseudobulbar palsy, Cheyne-Stoke respirations may be present
- Seizures may occur

Lab studies

- hyponatremia
- low serum osmolality
- low urine volume
- Serum bicarbonate normal
- Serum potassium concentration normal
- Anion gap is reduced
- Urinary sodium excretion increased
- BUN is unusually low, usually below 10 mg/dL

Lab studies

- Hypouricemia
- Glomerular filtration rate (GFR) is increased
- Imaging studies
- Acute water loading test
- ADH levels

Management

- Fluid restriction

  less than 75% of maintenance → good result

- Hypertonic sodium chloride solution (3%) usefull for hyponatremia with seizures or coma

- Steroids only indicated when they provide specific replacement therapy, such as in adrenal or pituitary insufficiency

Management

- Vasopressin analogs still experimental
- Lithium carbonate should be considered in children with chronic syndrome
- Demeclocycline can be used in children older than 8 years with chronic SIADH

Complications

- Fluid overload
- Acute extracellular hypoosmolality
- Cerebral edema
- Permanent brain damage
- Cerebral herniation

Prognosis

- Prompt recovery usually follows water restriction
- Prognosis of SIADH is usually that of the underlying disease

THANK YOU