

DISEASE

DIABETES INSIPIDUS

PATHOPHYSIOLOGY

- Decreased ADH reduces the kidney tubule's ability to collect H₂O & concentrate urine, resulting in dilute urine, excessive thirst, electrolyte imbalance, and excessive fluid intake
- H₂O metabolism problem caused by ADH synthesis decrease or kidney's inability to respond to ADH
- Classifications:
 - Nephrogenic—kidney tubules don't respond to ADH
 - Primary Neurogenic—lack of ADH production or release because of defect to hypothalamus or pituitary gland
 - Secondary Neurogenic—lack of ADH production or release because of infection, trauma, or brain surgery

RISK FACTORS

- Head injury
- Trauma
- Tumor or lesion
- Surgery or irradiation near or around the pituitary gland
- Infection (meningitis, encephalitis)
- Taking lithium carbonate or demeclocycline
- Stroke

CLINICAL MANIFESTATIONS

- Polyuria (abrupt onset of excessive urination, urinary output of 4 to 30 L/day of dilute urine): failure of the renal tubules to collect or reabsorb water
- Polydipsia (excessive thirst, consumption of 2 to 20 L/day)
- Older adult patients are at a higher risk for dehydration due to lower water content of the body, decreased thirst response, decreased ability of the kidneys to concentrate urine, increased use of diuretics, swallowing difficulties, or adequate food intake
- Tachycardia
- Hypotension
- Loss or absence of skin turgor
- Dry mucous membranes
- Weak, poor peripheral pulses
- Decreased cognition
- Ataxia
- Dehydration
- Fatigue
- Muscle pain and weakness
- Headache

DIAGNOSTICS

URINE TESTING: think DILUTE

- Decreased urine specific gravity
- Decreased urine osmolality
- Decreased urine pH
- Decreased urine sodium
- Decreased urine potassium
- As urine volume increases, urine osmolality

BLOOD TESTING: think CONCENTRATED

- Increased blood osmolality
- Increased blood sodium
- Increased blood potassium
- As blood volume increases, the blood osmolality increases

WATER DEPRIVATION TEST (ADH STIMULATION TEST):

- Dehydration is induced by withholding fluids
- A SQ injection of vasopressin produces urine output with an increased specific gravity and osmolality
- If the urine becomes more concentrated following injection, it is neurogenic DI. If little to no change, it is either nephrogenic DI or psychogenic polydipsia.

MEDICATIONS

ORAL CHLORPROPAMIDE (DIABENESE)

- Sulfonylurea: take with breakfast
- SE: low FSBS, decreased bone marrow function

DESMOPRESSIN ACETATE (DDAVP)

- Given intranasally or IV; vasopressin IM (tannate form) or IV aqueous
- SE: increased Na⁺, anaphylaxis, vasoconstriction, uterine cramps, flats, N/V/D

ADH REPLACEMENT AGENTS (OR NEUROGENIC DI)

- Desmopressin, which is a synthetic ADH, or aqueous vasopressin administered intranasally, orally, or parenterally
- This results in increased water absorption from kidneys and decreased urine output
- Chlorpropamide and thiazide diuretics facilitate vasopressin action (for clients who have neurogenic DI)
- Patients who have nephrogenic DI are prescribed prostaglandin inhibitors and thiazide diuretics and mild salt depletion

Nursing actions:

- Dose can be adjusted depending on urine output
- Give vasopressin cautiously to patients who have CAD (can cause vasoconstriction)
- Monitor for headache, confusion, or other SSS of water intoxication

NURSING INTERVENTIONS

& PATIENT TEACHING

NURSING CARE

- Monitor vitals, CVP, I&O, and lab studies (K⁺, Na⁺, BUN, creatinine, specific gravity, osmolality)
- Weigh patient daily
- Promote the prescribed diet (regular diet with restriction of foods that exercise a diuretic effect [caffeine])
- IV therapy: hydration (I&O must be matched to prevent dehydration) and electrolyte replacement
- Implement fall precautions
- Add bulk foods and fruit juices to the diet if constipation develops. A laxative might be needed
- Assess skin turgor and mucous membranes
- Provide skin and mouth care using a soft toothbrush and mild mouthwash to avoid trauma to the oral mucosa. Use alcohol-free skin care products, and apply emollient lotion after baths
- Encourage the patient to drink fluids in response to thirst and to match the volume of urine output

PATIENT EDUCATION

- Weigh daily, eat a high-fiber diet, wear a medical alert wristband, and monitor fluid I&O
- Monitor for indications of dehydration (weight loss, dry mucous membranes, dry, cracked lips, confusion, weakness)
- Restrict fluids as prescribed to prevent water intoxication, and avoid consumption of alcohol
- For neurogenic DI, lifelong self-administration of vasopressin therapy is required
- To administer intranasally vasopressin, clear nasal passage and sit upright prior to inhalation
- Monitor weight daily and notify the provider if a gain greater than 2 lbs in 24 hrs
- Restrict fluids if directed and notify the provider of headache or confusion

POSSIBLE COMPLICATIONS

- Excessive urine output from untreated DI can cause:

- Dehydration
- Hyperosmolality
- Hyponatremia
- Circulatory collapse
- Unconsciousness
- CNS damage
- Seizures

Nursing Actions:

- Monitor fluid balance and prevent dehydration by providing proper fluid intake

Client Education:

- Seek early medical attention for any indications of DI and follow care instructions

