desmopressin (des-moe-press-in)

Class: Antidiuretic hormones

Pregnancy Category: B

Indications
PO, Subcut, IV, Intranasal: Treatment of central diabetes insipidus caused by a deficiency of vasopressin.

Action
An analogue of naturally occurring vasopressin (antidiuretic hormone). Primary action is enhanced reabsorption of water in the kidneys.

Pharmacokinetics
Absorption: <1% absorbed following oral administration; nasal solution 10–20% absorbed; nasal spray 3–4% absorbed.

Distribution: Distribution not fully known. Enters breast milk.

Metabolism and Excretion: Unknown.

Half-life: PO – 1.5–2.5 hr; IV — 75 min (q in renal impairment); Intranasal — 3.3–3.5 hr.

TIME/ACTION PROFILE (PO, intranasal antidiuretic effect; IV effect on factor VIII activity)

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
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</thead>
<tbody>
<tr>
<td>PO</td>
<td>1 hr</td>
<td>4–7 hr</td>
<td>unknown</td>
</tr>
<tr>
<td>Intranasal</td>
<td>1 hr</td>
<td>1–5 hr</td>
<td>8–20 hr</td>
</tr>
<tr>
<td>IV</td>
<td>within min</td>
<td>15–30 min</td>
<td>3 hr†</td>
</tr>
<tr>
<td>Intranasal</td>
<td>—</td>
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</tbody>
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Contraindications/Precautions
Contraindicated in: Hypersensitivity. Hypersensitivity is chlorobutanol. Patients with severe type I, type IIb or platelet-type (rare) von Willebrand’s disease, hemophilia A with factor VIII levels <5% or hemophilia B; Renal impairment (GFR < 50 ml/min). Hypoestrogen.

Use Cautiously in: Angina pectoris; Hypertension; Patients at risk for hyponatremia; OB, Lactation: Safety not established.

Adverse Reactions/Side Effects
CNS: SEIZURES, drowsiness, headache, listlessness.

EENT: intranasal — nasal congestion, rhinitis.

Resp: dyspnea.

CV: hypertension, hypotension, tachycardia (large IV doses only).

GI: mild abdominal cramps, nausea.

GU: vulval pain.

Derm: flushing.

F and E: water intoxication/hyponatremia.

Local: phlebitis at IV site.

Interactions
Drug-Drug: Chlorpropamide, clofibrate, chlorpromazine, lamotrigine, SSRIs or carbamazepine may enhance the antidiuretic response to desmopressin. Demeclocycline, lithium, or norepinephrine may diminish the antidiuretic response to desmopressin. Large doses may enhance the effects of vasopressors.

Route/Dosage
Primary Nocturnal Enuresis
PO (Adults and Children 6 yr): 0.2 mg at bedtime; may be titrated up to 0.6 mg at bedtime to achieve desired response.

Diabetes Insipidus
PO (Adults and Children): 0.05 mg twice daily; adjusted as needed (oral range: 0.1–1.2 mg/day for adults or 0.4–2.0 mg/day for children, 2–3 divided doses).

Intranasal (Adults and Children 12 yr): DDAVP — 5–40 mcg (0.005–0.4 mL in 1–2 divided doses).

Subcut, IV (Adults and Children 12 yr): 0.1–1 mcg/day in 1–2 divided doses.

Hemophilia A/Von Willebrand’s disease
Intranasal (Adults and Children 0–50 kg): Stimate — 1 spray (50 mcg) in each nostril.
Intranasal (Adults and Children ≥50 kg): Estimate—1 spray (150 mcg) in one nostril.

IV (Adults and Children ≥3 mo): 0.3 mcg/kg, repeated as needed.

NURSING IMPLICATIONS

Assessment

- Administer intranasal one spray per use and administer more frequently than every 24–48 hr IV. Tachyphylaxis may develop.

- Nocturnal Enuresis: Monitor frequency of urination throughout therapy. Use caution to ensure a risk for water intoxication.

- Chronic intranasal use may cause tolerance or short-term tolerance (IV tachyphylaxis) may develop.

- Nocturnal Enuresis: Monitor frequency of urination throughout therapy. Use cautiously in patients at risk for water intoxication.

- Do not intranasal form for nocturnal enuresis.

- Diabetes Insipidus: Monitor plasma and plasma osmolality and urine volume frequently. Assess patient for symptoms of dehydration (nearly dry skin, mucous membranes, tachycardia, poor skin turgor). Weight patients daily and assess for edema.


- Monitor BP and pulse during IV infusion.

- Monitor intake and output and adjust fluid intake (especially in children and elderly) to avoid overhydration in patients receiving desmopressin for hemophilia.

- Toxicity and Overdose: Signs and symptoms of water intoxication include confusion, drowsiness, headache, weight gain, difficulty urinating, seizures, and coma.

- Treatment of overdose includes decreasing dose and, if symptoms are severe, administration of furosemide.

- Potential Nursing Diagnoses

- Deficient fluid volume (Indications)

- Excess fluid volume (Adverse Reactions)

Implementation

- IV: Begin at 0.03 mcg/kg/min (with a maximum of 0.3 mcg/kg/min) and adjust IV to a suitable effect of intranasal desmopressin.

- PO: Begin oral dosages 12 hr after last intranasal dose. Monitor response closely.

- Diabetes Insipidus: Parenteral dose for antidiuretic effect is administered directly IV or subcut.

- Hemophilia: Parenteral dose for control of bleeding is administered via IV infusion. If used preoperatively, administer 50 min prior to procedure.

- IV Administration

- pH: 3.5–5.0

- Direct IV (for diabetes insipidus): Administer undiluted. Concentration: 4 mcg/mL. Rate: Administer over 1 min.

- Intravenous Infusion (for hemophilia and von Willebrand’s disease): Dilute: Dilute each dose in 50 mL of 0.9% NaCl for adults and children ≥30 kg and in 10 mL in children weighing <10 kg. Concentration: maximum 0.5 mcg/mL. Rate: Administer over 15–30 min.

- Y-Site Compatibility: No information available.

- Intranasal: Intranasal dose is used preoperatively, administer 2 hr before procedure.

Patient/Family Teaching

- Advise patient to notify health care professional if bleeding is not controlled or if headache, dizziness, heartburn, nausea, abdominal cramps, midural pain, or severe nasal congestion occurs.

- Caution patient to avoid consumption of alcohol with this medication.

- Diabetes Insipidus: Instruct patient on intranasal administration. Medication is supplied with a flexible calibrated catheter (rhinyle). Draw solution into rhinyle. Insert one end of tube into nostril, blow on the other end to deposit solution deep into nasal cavity. An air-filled syringe may be attached to the plastic catheter for children, infants, or obtunded patients. Tube should be rinsed under water after each use.

- If nasal spray is used, prime pump prior to first use by pressing down 4 times. Caution patient that nasal sprays should not be used beyond the labeled number of sprays; subsequent sprays may not deliver accurate dose. Do not attempt to transfer remaining solution to another bottle.

- Instruct patient to take missed doses as soon as remembered but not if it is almost time for the next dose. Do not double doses.

- Advise patient that chronic or upper respiratory infections may decrease effectiveness of this therapy. If increased nasal output occurs, patient should contact health care professional for dosage adjustment.

- Patients with diabetes insipidus should carry identification at all times describing disease process and medication regimen.

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CONTINUED
desmopressin

Evaluation/Desired Outcomes

● Decreased frequency of nocturnal enuresis.
● Decrease in urine volume.
● Relief of polydipsia.
● Increased urine osmolality.
● Control of bleeding in hemophilia.

Why was this drug prescribed for your patient?