norepinephrine (nor-ep-i-nef-rin)

Levophed

Classification: Vasopressors

Pregnancy Category: C

Indications

Produces vasoconstriction and myocardial stimulation, which may be required after adequate fluid replacement in the treatment of severe hypotension and shock.

Action

Stimulates alpha-adrenergic receptors located mainly in blood vessels, causing constriction of both capacitance and resistance vessels. Also has minor beta-adrenergic activity (myocardial stimulation).

Therapeutic Effects:

Increased BP. Increased cardiac output.

Pharmacokinetics

Absorption:

IV administration results in complete bioavailability.

Distribution:

Concentrates in sympathetic nervous tissue. Does not cross the blood-brain barrier but readily crosses the placenta.

Metabolism and Excretion:

Taken up and metabolized rapidly by sympathetic nerve endings.

Half-life:

Unknown.

TIME/ACTION PROFILE (effects on BP)

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td>rapid</td>
<td>1–2</td>
<td>15 min</td>
</tr>
</tbody>
</table>

Contraindications/Precautions

Contraindicated in: Vascular, renovascular, or peripheral thrombosis; OB: uterine blood flow; Hypoxia; Hypercarbia; Hypothermia; severe anemia; severe hepatic or renal dysfunction; Cerebrovascular disease; Lactation: Safety not established.

Interactions

Drug-Drug:

Use with cyclopropane or halothane anesthesia, cardiac glycosides, doxapram, or local use of cocaine may result in myocardial irritability.

Use with MAO inhibitors, methyldopa, doxapram, or tricyclic antidepressants may result in severe hypertension. Alpha-adrenergic blockers can prevent pressure response. Beta blockers may exaggerate hypotension or block cardiac stimulation. Concurrent use with ergot alkaloids (ergotamine, ergonovine, methylergonovine, or oxytocin) may result in enhanced vasoconstriction and hypotension.

Route/Dosage

IV (Adults): 0.5–1 mcg/min initially, followed by maintenance infusion of 2–12 mcg/min titrated by BP response (average rate 2–4 mcg/min, up to 30 mcg/min for refractory shock have been used).

IV (Children): 0.1 mcg/kg/min initially; may be followed by infusion titrated to BP response, up to 1 mcg/kg/min.

NURSING IMPLICATIONS

Assessment

Monitor BP every 2–3 min until stabilized and every 5 min thereafter. Systolic BP is usually maintained at 80–100 mm Hg or 30–40 mm Hg below the previously existing systolic pressure in previously hypertensive patients. Consult physician for parameters. Continue to monitor BP frequently for hypotension following discontinuation of norepinephrine.

EGD should be monitored continuously. CVP, intra-arterial pressure, pulmonary artery diastolic pressure, pulmonary capillary wedge pressure (PCWP), and cardiac output may also be monitored.

Monitor urine output and notify health care professional if it decreases to 30 mL/hr.

Monitor BP frequently throughout infusion. A large vein should be used to minimize risk of extravasation, which may cause tissue necrosis. Phenolamine 5–10 mg/mL available.

Adverse Reactions/Side Effects

CNS: anxiety, diaphoresis, headache, tremor, restlessness, tremor, weakness.

Respiratory: Cough, breathlessness, bradycardia, chest pain, hyperventilation, MI, severe shortness of breath.

Endocrine: Hyperglycemia.

F and E: Metabolic acidosis.

Local: Phlebitis at IV site.

Miscellaneous: Fever.

Patient Information

Instruct patient to immediately report new or worsening fever, headache, or tremors.

Missed Dose:

If possible, restart at next scheduled dose. If hypotensive episode is severe or continuous, notify health care professional.

Storage:

Store at room temperature.

High Alert: norepinephrine
mg may be added to each liter of solution to prevent sloughing of tissue in extravasation. If extravasation occurs, the site should be infiltrated promptly with 10–15 mL of 0.9% NaCl solution containing 5–10 mg of phentolamine to prevent necrosis and sloughing. If prolonged therapy is required or if blanching along the course of the vein occurs, change injection sites to provide relief from vasoconstriction.

**Potential Nursing Diagnoses**

Decreased cardiac output (Indications)

Ineffective tissue perfusion (Indications)

**Implementation**

- **High Alert:** Vasoactive medications are inherently dangerous. Have second practitioners independently check original order, dose calculations, and infusion pump programming. Establish maximum dose limits. Norepinephrine overdose can result in severe peripheral vasoconstriction with resultant ischemia and necrosis of peripheral tissue. Assess peripheral circulation frequently.

- **Y-Site Compatibility:** amphotericin B colloidal, amphotericin B lipid complex, azathioprine, dantrolene, foscarnet, ganciclovir, indomethacin, pentobarbital, phenytoin, sodium bicarbonate, thiopental, trimethoprim/sulfamethoxazole.

**Y-Site Compatibility:**

- amphotericin B colloidal, amphotericin B lipid complex, azathioprine, dantrolene, foscarnet, ganciclovir, indomethacin, pentobarbital, phenytoin, sodium bicarbonate, thiopental, trimethoprim/sulfamethoxazole.

**Y-Site Incompatibility:**

- amphotericin B colloidal, amphotericin B lipid complex, azathioprine, dantrolene, foscarnet, ganciclovir, indomethacin, pentobarbital, phenytoin, sodium bicarbonate, thiopental, trimethoprim/sulfamethoxazole.
norepinephrine

Patient/Family Teaching

- Instruct patient to report headache, dizziness, drop in blood pressure, chest pain, or pain at infusion site promptly.

Evaluation/Desired Outcomes

- Increase in BP to normal range.
- Increased tissue perfusion.

Why was this drug prescribed for your patient?