deferoxamine (de-fer-ox-a-men) Desferal

Classification
Therapeutic: antidotes
Pharmacologic: heavy metal antagonists

Pregnancy Category C

Indications
Acute toxic iron ingestion. Secondary iron overload syndromes associated with multiple transfusion therapy.

Action
Chelates unbound iron, forming a water-soluble complex (ferrioxamine) in plasma that is easily excreted by the kidneys. Therapeutic Effects: Removal of excess iron. Also chelates aluminum.

Pharmacokinetics
Absorption: Poorly absorbed after oral administration. Well absorbed after IM and subcut administration. Distribution: Appears to be widely distributed. Metabolism and Excretion: Metabolized by tissues and plasma enzymes. Unchanged drug and chelated form excreted by the kidneys; 33% of iron removed is eliminated in the feces via biliary excretion. Half-life: 1 hr.

TIME/ACTION PROFILE (effects on hematologic parameters)

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<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
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<td>IM</td>
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<td>Subcut</td>
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Contraindications/Precautions
Contraindicated in: Severe renal disease; Anuria; OB: Early pregnancy or childbearing potential (however, may be used safely in pregnant patients with moderate-to-severe acute iron intoxication).

Use Cautiously in: Pedi: Children 3 yr (safety not established).

Adverse Reactions/Side Effects

Interactions
Drug-Drug: Ascorbic acid may decrease effectiveness of deferoxamine but may also decrease cardiac iron toxicity.

Route/Dosage
Acute Iron Ingestion
IM, IV (Adults and Children ≥ 3 yr): 1 g, then 500 mg q 4 hr for 2 doses. Additional doses of 500 mg q 4–12 hr may be needed (not to exceed 6 g/24 hr).

Chronic Iron Overload
IM, IV (Adults and Children ≥ 3 yr): 500 mg–1 g daily IM. Additional doses of 2 g should be given IV for each unit of blood transfused (not to exceed 1 g/day in absence of transfusions). Subcut (Adults and Children ≥ 3 yr): 1–2 g/day (20–40 mg/kg/day) infused over 8–24 hr.

NURSING IMPLICATIONS
Assessment
- In acute poisoning, assess time, amount, and type of iron preparation ingested.
- Monitor signs of iron toxicity: Early acute (abdominal pain, bloody diarrhea, emesis), late acute (decreased level of consciousness, shock, metabolic acidosis).
- Monitor vital signs closely, especially during IV administration. Report hypotension, erythema, urticaria, or signs of allergic reaction. Keep epinephrine, an antihistamine, and resuscitation equipment close by in the event of an anaphylactic reaction.
- May cause oliguria or anuria. Report decreased renal or cardiac function. Renal function should be performed every 3 mo in patients with chronic iron overload.
- Monitor intake and output and urine color. Inform health care professional if patient is anuric. Chelated iron is excreted primarily by the kidneys; urine may turn red.

Use cautiously in: Hypersensitivity to ascorbic acid or related substances; patients with known allergy or sensitivity to other drugs used to treat iron overload.

Drug Interactions
- A possible interaction with ascorbic acid and deferoxamine has been suggested in the literature. The clinical significance of this interaction is unknown. An increase in serum levels of deferoxamine may be expected following administration of ascorbic acid.

Patient Education
- Teach patient and caregivers to report hypotension, flushing, or any sign of an allergic reaction to health care professional immediately.
- Instruct patient to monitor urine color and report any change to health care professional.
- Advise patient to notify health care professional of all Rx or OTC medications, vitamins, or herbal products being taken. Use of this drug concurrently with ascorbic acid should be avoided.

Overdose
- Effects: Hypotension, lactic acidosis, hypovolemic shock, cardiac arrest, anaphylactic reactions, respiratory failure.
- Management: Remove patient from source of drug. Supportive measures. Use measures to resuscitate patient.
Lab Test Considerations: Monitor serum iron, total iron binding capacity (TIBC), ferritin levels, and urinary iron excretion before and periodically during therapy.

Potential Nursing Diagnoses
Risk for injury poisoning (Indications)

Implementation
- IM route is preferred in acute iron intoxication unless patient is in shock.
- Reconstitute 500 mg vial with 2 mL and 2-g vial with 8 mL of sterile water for injection for a concentration of 213 mg/mL. Dissolve powder completely before administration. Solution is yellow and is stable for 1 wk after reconstitution if protected from light. Discontinue if solution becomes cloudy.
- Use in conjunction with induction of emesis or gastric aspiration and lavage with sodium bicarbonate, and supportive measures for shock and metabolic acidosis in acute poisoning.
- IM: Administer deep DE and massage well. Rotate sites. IM administration may cause transient muscle pain.
- Subcut: Reconstitute 500 mg vial with 5 mL and 2-g vial with 20 mL of sterile water for injection. Concentration: 95 mg/mL. Subcut route used to treat chronically elevated iron therapy is administered into abdominal subcut tissue via infus- sion pump for 8–24 hr per treatment.
- IV: Reconstitute 500 mg vial with 5 mL and 2-g vial with 20 mL of sterile water for injection. Concentration: 95 mg/mL. Diluent: D5W, 0.9% NaCl, 0.45% NaCl, or LR. Dissolve powder completely before administration. Solution is clear and colorless to slightly yellow. Administer within 3 hr of reconstitution. 24 hr pre-pared under laminar flow hood. Decadron level solution: Rate: Maximum infusion rate is 15 mg/kg/hr for first 1000 mg. May be followed by 500 mg infused over 4 hr at slower rate to receive 125 mg/hr. Rapid infusion rate may cause hypo- tension, syncope, urticaria, wheezing, convulsions, tachycardia, or shock.
- May be administered at the same time as blood transfusions in persons with chronically elevated serum iron levels. Use separate site for administration.

Patient/Family Teaching
- Reinforce need to keep iron preparations, all medications, and hazardous substances out of the reach of children.
- Desire patient that red coloration of urine is expected and reflects excretion of excess iron.
- May cause dizziness or impairment of vision or hearing. Caution patient to avoid driving or other activities requiring alertness until response from medication is known.
- Advise patient not to take vitamin C preparations without consulting health care professional, because tissue toxicity may increase.
- Encourage patients requiring chronic therapy to keep follow-up appointments for laboratory tests and hearing exams may be monitored every 3 mo.

Evaluation/Desired Outcomes
- Return of serum iron concentration to a normal level (90–150 mcg/100 mL).

Why was this drug prescribed for your patient?