1 hydroxocobalamin (hye-drox-oh-koe-bal-a-min)

Cyanokit

Classifications
Therapeutic: antianemics, vitamins
Pharmacologic: water soluble vitamins

Pregnancy Category C

Indications

Action
Necessary coenzyme for metabolic processes, including fat and carbohydrate metabolism and protein synthesis. Required for cell reproduction and hematopoiesis.

Therapeutic Effects:
Corrects manifestations of pernicious anemia (megaloblastic indices, GI lesions, and neurologic damage). Corrects vitamin B12 deficiency. Reverses symptoms of cyanide toxicity.

Pharmacokinetics
Absorption:
Significant protein binding occurs after intravenous administration.

Distribution:
Unknown.

Metabolism and Excretion:
Primarily excreted unchanged in urine.

Half-life:
26–31 hr.

TIME/ACTION PROFILE (reticulocytosis)

ROUTE ONSET PEAK DURATION
IM unknown unknown unknown

Contraindications/Precautions
Contraindicated in:
Hypersensitivity.

Use Cautiously in:
IM injection: Uremia, folic acid deficiency, concurrent infection; Pedi: Cyanokit—Safety and effectiveness not established; GIS: Cyanokit—Use only if potential benefit justifies potential risk.

Adverse Reactions/Side Effects

IM injection
GI:
Dyspepsia, nausea, vomiting.

CNS:
Dizziness, headache, memory impairment, restlessness.

CV:
Hypertension, chest pain, edema, tachycardia. EENT:
Dry mouth, eye redness, eye swelling, drooping eyelids, hyperacusis, tinnitus, vomiting. GU:
Nausea; Neonates: cyanosis, urticaria.

Misc:
Hypersensitivity reactions including ANAPHYLAXIS.

Cyanokit
CNS:
Dizziness, headache, memory impairment, restlessness.

CV:
Hypertension, chest pain, edema, tachycardia.

EENT:
Dry mouth, eye redness, eye swelling.

Resp:
Dyspnea.

GI:
Abdominal discomfort, diarrhea, dyspepsia, dysphagia, hematochezia, nausea, vomiting.

GU:
Nausea; Neonates: cyanosis, urticaria.

Interactions

Drug-Drug: Chloramphenicol and antineoplastics may interfere with hematologic response to vitamin B12. Colchicine, aminosalicylic acid, or excessive intake of alcohol or vitamin C may interfere with effectiveness of vitamin B12.

Route/Dosage

Vitamin B12 Deficiency (IM only)

IM (Adults):
30 mcg/day for 5–10 days, then 100–200 mcg/month.

IM (Children): 100 mcg/day for 2 or more weeks (to achieve total dose of 1000–5000 mcg), then 30–50 mcg/month.

Pernicious Anemia (IM only)

IM (Adults): 100 mcg/day for 6–7 days; if improvement, give same dose every other day for 7 doses, then every 3–4 days for 2–3 wk, once hematologic values return to normal (remission), give maintenance dose of 100 mcg/month.

IM (Children): 30–50 mcg/day for 2 or more weeks (to achieve total dose of 1000–5000 mcg), then 100 mcg/month.

Schilling Test

IM: Subcut (Adults): Flushing dose is 1000 mcg.

Cyanide Poisoning (Cyanokit only)

IV (Adults): 5 g over 15 min; another 5 g dose may be infused over 15–120 min depending upon severity of poisoning (maximum cumulative dose = 10 g).

Contraindications/Precautions

Contraindicated in:
Hypersensitivity.

Use Cautiously in:
IM injection: Uremia, folic acid deficiency, concomitant infection, iron deficiency (response to vitamin B12 will be impaired); Pedi: Cyanokit—Safety and effectiveness not established; GIS: Cyanokit—Use only if potential benefit justifies potential risk.

• = Generic drug name  H = Genetic Implication  OPTIM indicate life-threatening  underline indicate most frequent  discontinued
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NURSING IMPLICATIONS

Assessment
- Assess patient for signs of vitamin B12 deficiency (pallor; neuropsychiatric; psychomotor; red, inflamed tongue) before and periodically during therapy.

Lab Test Considerations: Monitor plasma folic acid, vitamin B12, and iron levels, hemoglobin, hematocrit, and reticulocyte count before treatment, then once every 1–3 mo. Evaluate serum potassium levels for patients with strong vitamin B12 levels for hypokalemia during the first 48 hr of treatment. Serum potassium levels and platelet counts should be monitored routinely during the course of therapy.

Consent: Management of cyanide poisoning should also include establishment of airway, ensuring adequate oxygenation and hydration, cardiovascular support, and seizure management. Monitor BP and HR continuously during and after infusion and immediately report significant changes. The maximal q in BP usually occurs toward the end of the infusion. BP usually returns to baseline within 4 hr of drug administration.

Potential Nursing Diagnoses
- Imbalanced nutrition: less than body requirements (Indications)
- Activity intolerance (Indications)
- Risk for poisoning (Indications)

Implementation
- Usually administered in combination with other vitamins; solitary vitamin B12 deficiencies are rare.
- Administration of vitamin B12 by the oral route is useful only for nutritional deficiencies. Patients with small-bowel disease, malabsorption syndrome, or gastric or ileal resections require parenteral administration.
- IM: Vials should be protected from light.
- Subcutaneous route used; deep subcutaneous administration is preferred.
- Intravenous Infusion: Reconstitute each 5-g vial with 200 mL of 0.9% NaCl, D5W, or LR. Gently invert the vial for at least 60 sec prior to infusion. Reconstituted red can be hung for infusion. Solution is colorless; do not administer solutions that are discolored or contain particulate matter.
- Reconstituted solutions are stable for 6 hr at room temperature. Discard any unused solution after 48 hr.
- Administer additional 5–g dose over 15–120 min.

Patient/Family Teaching
- Encourage patient to comply with diet recommendations of health care professional. Explain that the best source of vitamins is a well-balanced diet with foods from the four basic food groups.
- Foods high in vitamin B12 include meats, seafood, egg yolks, and fermented foods.
- Foods with high levels of vitamin B12 include meats, seafood, egg yolks, and fermented cheeses; few vitamins are lost with ordinary cooking.
- Patients self-administering with vitamin supplements should be cautioned not to exceed RDA. Effectiveness of megadose treatments and various medical conditions is unproved and may cause side effects.
- Inform patients with pernicious anemia of the lifelong need for vitamin B12 replacement.
- Emphasize the importance of follow-up exams to evaluate progress.
- Intravenous Infusion: Advise patients that skin redness may last up to 2 wk and that their urine may remain red for up to 5 wk after drug administration. Instruct patient to avoid sun exposure while their skin is red. Advise patient to contact health care professional if skin or urine redness persists after these time periods.
- Advise patient that a rash may develop from 7–28 days after drug administration. It will usually resolve without treatment within a few weeks. Advise patient to contact health care professional if rash persists after this time period.

Evaluation/Desired Outcomes
- Resolution of the symptoms of vitamin B12 deficiency.
- Increase in reticulocyte count.
- Improvement in manifestations of pernicious anemia.
- Resolution of symptoms of cyanide poisoning.

Why was this drug prescribed for your patient?