pentamidine (pen-tam-i-deen)

SoluPent, Pentan 300

Classification
Anti-inflective

Pregnancy Category C

Indications
IV, IM: Treatment of Pneumocystis jirovecii pneumonia (PJP).
Inhaln: Prevention of PJP in AIDS or HIV-positive patients who have had PJP or who have a peripheral CD4 lymphocyte count of <200/mm3.

Action
Appears to disrupt DNA or RNA synthesis. Also has a direct toxic effect on pancreatic islet cells.

Therapeutic Effects:
Death of susceptible organism.

Pharmacokinetics
Absorption: Well absorbed parenterally; Minimal systemic absorption occurs following inhalation.
Distribution: Widely and extensively distributed but does not cross the blood-brain barrier. Concentrates in liver, kidneys, lungs, and spleen, with prolonged storage in some tissues.
Metabolism and Excretion: 1–20% excreted unchanged by the kidneys. Remainder of metabolic fate unknown.
Half-life: 5–11 hr (qin renal impairment).

TIME/ACTION PROFILE (blood levels)
ROUTE ONSET PEAK DURATION
IV unknown end of infusion 24 hr
Inhaln unknown unknown unknown

Contraindications/Precautions
Contraindicated in: History of previous anaphylactic reaction to pentamidine.

Use Cautiously in: Hypotension; Hypertension; Hypoglycemia; Hyperglycemia; Hypocalcemia; Leukopenia; Thrombocytopenia; Anemia; Renal impairment (dose required); Diabetes mellitus; Liver impairment; Cardiacar disease; Bone marrow depression; previous antineoplastic therapy; or radiation therapy. Asthma (aerosols an indirect bronchoconstr.).

Adverse Reactions/Side Effects

Interactions
Interactions listed for parenteral administration
Drug-Drug: Concurrent use with erythromycin IV may risk of potentially fatal arrhythmias. Additive nephrotoxicity with other nephrotoxic agents, including aminoglycosides, amphotericin B, and vancomycin. Additive bone marrow depression with antineoplastics or previous antineoplastic therapy. Risk of pancreatitis with didanosine.
Risk of nephrotoxicity, hypocalcemia, and hyperglycemia with foscarnet.

Route/Dosage
IV, IM (Adults and Children ≥5 yr): 4 mg/kg once daily for 14–21 days (longer treatment may be required in AIDS patients; some patients may respond to 3 mg/kg/day).

Inhaln (Adults): NebuPent—300 mg q 4 wk, using a Respirgard II jet nebulizer (150 mg q 2 wk has also been used).

Inhaln (Children ≥5 yr): NebuPent—300 mg q 4 wk, using a Respirgard II jet nebulizer (for patients who cannot tolerate trimethoprim/sulfamethoxazole, unlabeled).

Renal Impairment
IV (Adults): CCr 10–30 mL/min—Administer normal dose q 24 hr; CCr ≤10 mL/min—Administer normal dose q 48 hr.
2

NURSING IMPLICATIONS

Assessment

- Assess patient for infection (vital signs, symptomatology, WBC counts). Monitor respiratory status (vital signs, sputum, lung sounds, respiration) at beginning of and throughout therapy.

- Obtain specimens for culture and sensitivity prior to initiating therapy. First dose may be given before receiving results.

- Monitor for rash periodically during therapy. May cause Stevens-Johnson syndrome or toxic epidermal necrolysis. Discontinue therapy if severe or if accompanied with fever, general malaise, fatigue, muscle or joint aches, muscle weakness, jaundice, hepatitis and/or eosinophilia.

- IV, IM: Monitor BP frequently during and following IM or IV administration of pentamidine. Patient should be laying down during administration. Monitor for hypotension or severe hypotension may occur following a single dose. Rehydration equipment should be immediately available.

- Assess for signs of pancreatitis (nausea, emesis, abdominal pain, increased serum lipase or amylase) periodically during therapy. May require discontinuation of therapy.

- Assess patient for hyperglycemia (anxiety; chills; diaphoresis; cold, pale skin; headache; increased hunger; nausea; nervousness; shakiness) and hypoglycemia (drowsiness; flushed, dry skin; fast pulse; headache; increased urination; loss of appetite). Monitor serum glucose concentrations prior to, daily during, and for several months following therapy. Severe hypoglycemia and permanent diabetes mellitus have occurred.

- Pulse and ECG should be monitored prior to and periodically during therapy. Fatalities due to cardiac arrhythmias, tachycardia, and cardiotoxicity have been reported.

- Monitor for signs of hypoglycemia (anxiety; chills; diaphoresis; cold, pale skin; headache; increased hunger; nervousness; shakiness) and hyperglycemia (drowsiness; flushed, dry skin; fast pulse; headache; increased urination; loss of appetite). May require discontinuation of therapy.

- Monitor for signs of hypocalcemia and hypomagnesemia. Monitor serum calcium and magnesium concentrations prior to and every 3 days during therapy. May cause severe hypocalcemia.

- Pentamidine dosing
- IV: Dilute 300 mg of pentamidine with 3 mL of sterile water for injection for a concentration of 100 mg/mL.

- Monitor BUN and serum creatinine before and during therapy to monitor for nephrotoxicity. Concentrations may be elevated.

- Monitor CBC and platelet count prior to and every 3 days during therapy. Pentamidine may cause leukopenia, anemia, and thrombocytopenia.

- Monitor serum bilirubin, alkaline phosphatase, AST, and ALT concentrations. Prevention of jaundice with pentamidine may cause elevated liver function tests.

- Monitor serum calcium and magnesium concentrations prior to and every 3 days during therapy. May cause hypocalcemia and hypomagnesemia.

- Monitor renal function tests.

- Monitor serum bilirubin concentrations.

- Monitor serum calcium and magnesium concentrations.

- Monitor for signs of neutropenia and thrombocytopenia. Pentamidine may cause bone marrow suppression and severe neutropenia and thrombocytopenia.

Potential Nursing Diagnoses

- Risk for infection (aspiration pneumonia, sepsis, abscess formation).

Implementation

- Pentamidine must be given on a regular schedule for the full course of therapy. Administer missed doses as soon as remembered. If almost time for the next dose, skip the missed dose and return to the regular schedule. Do not double doses.

- IM: Dilute 300 mg of pentamidine with 3 mL of sterile water for injection. IM administration should be used only for patients with adequate muscle mass.

- IV Administration

- pH: 4.3–5.4.

- Y-Site Compatibility: aminocaproic acid, pentamidine, rutin, talc, verapamil, vancomycin, vecuronium, zosyn.
Continued

Pentamidine

Nitroglycerin, nitroprusside, norepinephrine, octreotide, ondansetron, oxaliplatin, oxytocin, paclitaxel, pamidronate, pancuronium, papaverine, pentazocine, phentolamine, phytonadione, potassium acetate, procainamide, promethazine, propranolol, pyridoxime, quinupristin/dalfopristin, ranitidine, rituximab, rocuronium, sodium acetate, succinylcholine, sufentanil, tacrolimus, teniposide, theophylline, thiamine, thiotepa, tigecycline, tolazoline, trastuzumab, trimetaphan, vancomycin, vasopressin, verapamil, vincristine, vinorelbine, voriconazole, zidovudine, zoledronic acid.

Y-site incompatibility: acyclovir, aldesleukin, amikacin, amphotericin B colloidal, amphotericin B lipid complex, amphotericin B liposome, ampicillin, ampicillin/sulbactam, ascorbic acid, azathioprine, aztreonam, bevacizumab, bumetanide, butorphanol, cefazolin, cefoperazone, cefotaxime, cefotetan, cefoxitin, ceftazidime, chloramphenicol, clindamycin, dantrolene, dexamethasone, diazepam, diazoxide, digoxin, doxorubicin, ephedrine, epoetin alfa, epirubicin, erlotinib, furosemide, gentamicin, heparin, hydrocortisone, indomethacin, insulin, ketorolac, linezolid, magnesium sulfate, methotrexate, methylprednisolone, methyldopate, morphine, nalbuphine, oxacillin, palonosetron, pantoprazole, penicillin G, pentobarbital, phenobarbital, phenylephrine, phenytoin, piperacillin/tazobactam, potassium chloride, prochlorperazine, promethazine, propofol, quinupristin/dalfopristin, rasburicase, rituximab, rituximab, sodium bicarbonate, streptokinase, ticarcillin/clavulanate, tobramycin, trimethoprim/sulfamethoxazole, vecuronium.

Inhalation:

If using inhalation bronchodilator, administer bronchodilator 5–10 min prior to pentamidine administration.

Instruct patient to notify health care professional promptly if signs and symptoms of pancreatitis, rash, fever, sore throat, signs of infection; bleeding of gums; unusual bruising; petechiae; or blood in stool, urine, or emesis occurs. Caution patient to avoid crowds and persons with known infections. Instruct patient to use soft toothbrush and electric razor and to avoid falls. Patient should not be given IM injections or rectal thermometers.

Instruct patient to continue to drink alcoholic beverages and take medication containing aspirin or NSAIDs, as those may precipitate gas- tric bleeding.

Caution patient to make position changes slowly to minimize orthostatic hypotension.

Advise patient that an unpleasant metallic taste may occur with pentamidine administration but is not significant.

Inform patients who continue to smoke that bronchospasm and coughing during therapy are more likely.

Evaluation/Desired Outcomes

Prevention or resolution of the signs and symptoms of PJP in HIV-positive patients.

Why was this drug prescribed for your patient?

Admonish pharmacist to ensure the inhalator is held in the patient's mouth before administration of nebulizer.

Administer inhalation dose through nebulizer until chamber is empty, approximately 30–45 min.

Administer with the flow rate of the nebulizer at the midflow mark (5–7 L/min) over approximately 15 min until the chamber is empty.

Inform patient of the importance of completing the full course of pentamidine therapy, even if feeling better.

Patient/Family Teaching

Inform patient to notify health care professional promptly if signs and symptoms of pancreatitis, rash, fever, sore throat, signs of infection; bleeding of gums; unusual bruising; petechiae; or blood in stool, urine, or emesis occurs. Caution patient to avoid crowds and persons with known infections. Instruct patient to use soft toothbrush and electric razor and to avoid falls. Patient should not be given IM injections or rectal thermometers. Caution patient not to drink alcoholic beverages or take medication containing aspirin or NSAIDs, as those may precipitate gastric bleeding.

Instruct patient to make position changes slowly to minimize orthostatic hypotension.

Advise patient that an unpleasant metallic taste may occur with pentamidine administration but is not significant.

Inform patients who continue to smoke that bronchospasm and coughing during therapy are more likely.

Evaluation/Desired Outcomes

Prevention or resolution of the signs and symptoms of PJP in HIV-positive patients.

Why was this drug prescribed for your patient?

- Administer inhalation dose through nebulizer until chamber is empty, approximately 30–45 min.
- Administer with the flow rate of the nebulizer at the midflow mark (5–7 L/min) over approximately 15 min until the chamber is empty.
- Inform patient of the importance of completing the full course of pentamidine therapy, even if feeling better.
- Instruct patient to notify health care professional promptly if signs and symptoms of pancreatitis, rash, fever, sore throat, signs of infection; bleeding of gums; unusual bruising; petechiae; or blood in stool, urine, or emesis occurs. Caution patient to avoid crowds and persons with known infections. Instruct patient to use soft toothbrush and electric razor and to avoid falls. Patient should not be given IM injections or rectal thermometers. Caution patient not to drink alcoholic beverages or take medication containing aspirin or NSAIDs, as those may precipitate gastric bleeding.
- Caution patient to make position changes slowly to minimize orthostatic hypotension.
- Advise patient that an unpleasant metallic taste may occur with pentamidine administration but is not significant.
- Inform patients who continue to smoke that bronchospasm and coughing during therapy are more likely.

Evaluation/Desired Outcomes

Prevention or resolution of the signs and symptoms of PJP in HIV-positive patients.

Why was this drug prescribed for your patient?