pegaspargase (peg-ass-par-jase)

**Classifications**
- Antineoplastics
- Enzymes
- Pharmacologic: antidiabetics

**Pregnancy Category C**

**Indications**
Treatment (unlabelled) of acute lymphoblastic leukemia (ALL) in patients who have had a previous hypersensitivity reaction to native asparaginase.

**Action**
Germfree L-asparaginase bound to polyethylene glycol (PEG). This compound delivers asparaginase to leukemic cells, which cannot synthesize their own asparagine and are thus susceptible to the effects of asparaginase. Binding to PEG renders asparaginase less antigenic and therefore less likely to induce hypersensitivity reactions.

**Therapeutic Effects:** Death of leukemic cells.

**Pharmacokinetics**
- **Absorption:** IV administration results in complete bioavailability.
- **Distribution:** Unknown.
- **Metabolism and Excretion:** Metabolized by serum proteases and in the reticuloendothelial system.
- **Half-life:** 5.7 days (less in patients with previous hypersensitivity to native L-asparaginase).

**Time/Action Profile (hematologic effects)**
- **ROUTE**
  - **ONSET**
  - **PEAK**
  - **DURATION**
- IV: Rapid, unknown, 14 days

**Contraindications/Precautions**
- Use cautiously in:
  - History of previous hypersensitivity reactions to other drugs.
  - Patients with childbearing potential.
- OB, Lactation: Safety not established.

**Adverse Reactions/Side Effects**
- **CNS:** Seizures, headache, malaise.
- **CV:** Hypertension, and abnormal heart function tests.
- **GI:** Pancreatitis, abdominal pain, anorexia, diarrhea, hyperbilirubinemia, nausea, vomiting.
- **Hemat:** Anemia, increased thromboplastin, leukopenia, pancytopenia, platelet dysfunction, disseminated intravascular coagulation, hemorrhagic anemia.

**Interactions**
Drug-drug: May alter response to anticoagulants.

**Use Cautiously in:**
- Pancreatitis or history of pancreatitis.
- History of previous hemorrhagic reaction to asparaginase therapy.
- Previous hypersensitivity reactions to pegaspargase.

**Route/Dosage**
- IM, IV (Adults up to 21 yr, and Children with Body Surface Area <0.6 m²): 2500 IU/m² q 14 days (usually in combination with other agents).
- IM, IV (Children with Body Surface Area ≥0.6 m²): 82.5 IU/kg q 14 days (usually in combination with other agents).

**NURSING IMPLICATIONS**
- **Assessment**
  - Assess patient for previous hypersensitivity reactions to native L-asparaginase.
  - Monitor for hypersensitivity reaction (urticaria, diaphoresis, facial swelling, joint pain, hypotension, bronchospasm) for at least 1 hr following administration. Epinephrine and resuscitation equipment should be readily available. Reaction may occur up to 2 hr after administration.
  - Monitor for development of bone marrow depression. Assess for fever, sore throat, and signs of infection. Monitor platelet count throughout therapy. Assess for bleeding (gastrointestinal, pulmonary, and other). Monitor patient for infection and skin breakdown. Apheresis and resuscitation equipment should be available. Reaction may occur up to 2 hr after administration.
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- **Nursing Considerations**
  - **Patient/Family Teaching**
  - Teach patient signs of bone marrow suppression and infection. Instruct patient to report skin breakdown. Instruct patient to avoid crowds, individuals with infections, and contact lenses. Teach patient to report signs of bone marrow suppression and infection. Instruct patient to avoid crowds, individuals with infections, and contact lenses.

- **Evaluation**
  - **Outcomes**
  - Bone marrow depression.
  - Complete blood count.
  - Platelet count.
  - Thrombocytopenia.
Lab Test Considerations: Monitor CBC prior to and periodically throughout therapy. May alter coagulation studies. Thrombosis may be decreased. PT and partial thromboplastin time (PTT) may be ↑.

Monitor serum amylase frequently to detect pancreatitis.

Monitor blood glucose; may cause hyperglycemia.

May cause elevated BUN and serum creatinine.

Hepatotoxicity may be manifested by increased AST, ALT, or bilirubin. Liver function tests usually return to normal after therapy.

May cause ↑ serum calcium.

May cause elevated serum and urine uric acid and hyponatremia.

Potential Nursing Diagnoses
Risk for infection (Adverse Reactions)

Implementation

IM is the preferred route because of a lower incidence of adverse reactions.

Solutions should be prepared in a biologic cabinet. Wear gloves, gown, and mask while handling medication. Discard equipment in specially designated containers.

IM:

Limit single injection volume to 2 mL. If volume of injection is >2 mL, use multiple injection sites.

IV Administration

pH: 7.3.

Intermittent Infusion: Diluent: Dilute each dose in 100 mL of 0.9% NaCl or D5W. Do not shake or agitate. Do not use if solution is cloudy or has formed a precipitate.

Do not reuse vials. Discard unused portions.

Keep refrigerated but do not freeze. Freezing destroys activity but does not change the appearance of pegaspargase. Rate: Administer over 1–2 hr via I.V. line through an infusion that is already running.

Additive Incompatibility: Information unavailable. Do not admix with other medications or solutions.

Patient/Family Teaching

Inform patient of the possibility of hypersensitivity reactions, including anaphylaxis.

Advise patient that concurrent use of other medications may increase the risk of bleeding and the toxicity of pegaspargase. General health care professional before taking any other medications, including OTC drugs.

Inform patient to notify health care professional of abdominal pain, severe nausea and vomiting, jaundice, fever, chills, sore throat, bleeding or bruising, excess thirst or urination, or mouth sores occur. Caution patient to avoid crowds and persons with known infections. Instruct patient to use soft toothbrush, electric razor, and to be especially careful to avoid falls. Patients should also be cautioned not to drink alcohol. Liver enzymes or other medications containing aspirin or NSAIDs because these may precipitate gastric bleeding.

Inform patient not to receive any vaccinations without advice of health care professional. Advise parents that this may alter child’s immunization schedule.

Emphasize the need for periodic lab tests to monitor for side effects.

Evaluation/Desired Outcomes

Potential hematologic status in patients with leukemia.

Why was this drug prescribed for your patient?