bendamustine (ben-da-muss-teen)

Treanda

Classification
Therapeutic: antineoplastics
Pharmacologic: benzdiazepines

Pregnancy Category D

Indications
Chronic lymphocytic leukemia. Indolent B-cell non-Hodgkin’s lymphoma that has progressed during or within 6 mo of receiving rituximab or a rituximab-containing regimen.

Action
DNA intercalation resulting in death of rapidly replicating cells.

Therapeutic Effects:
Decreased proliferation of leukemic cells. Death of lymphoma cells.

Pharmacokinetics

Absorption: IV administration results in complete bioavailability.

Distribution: Distributes freely into red blood cells.

Protein Binding: 94–96%.

Metabolism and Excretion: Mostly metabolized (partially by the CYP1A2 enzyme system); 90% excreted in feces; some renal elimination. Although metabolites have antineoplastic activity, levels are extremely low.

Half-life: 40 min.

TIME/ACTION PROFILE (blood levels)

<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>end of infusion</td>
<td>unknown</td>
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Contraindications/Precautions

Contraindicated in: Hypersensitivity to bendamustine or mannitol; Moderate-to-severe renal impairment (CCr ≤ 40 mL/min; Moderate or severe hepatic impairment; OB, Lactation: Pregnancy or lactation.

Use Cautiously in:
Patients at risk for tumor lysis syndrome (concurrent allopurinol recommended); Mild hepatic impairment; Mild to moderate renal impairment; Patients with child-bearing potential; May be more susceptible to adverse reactions. Use Cautiously in: Moderate-to-severe renal impairment.

Adverse Reactions/Side Effects

CNS:
Fatigue, weakness.

Resp:
Cough.

GI:
Nausea, vomiting, diarrhea.

Derm:
Skin reactions.

Hemat:
anemia, leukopenia, neutropenia, thrombocytopenia.

Metab:
Hyperuricemia.

Misc:
Malignancy, tumor lysis syndrome, allergic reactions including anaphylaxis, fever, infusion reactions.

Interactions

Drug-Drug: CYP1A2 inhibitors, including fluoxetine and erythromycin may ↓ levels of bendamustine and ↑ levels of active metabolites; consider alternative treatments. CYP1A2 inducers, including rifampin and smoking may ↑ levels of bendamustine and ↓ levels of its active metabolites; consider alternative treatments.

Route/Dosage

Chronic Lymphocytic Leukemia

IV (Adults): 100 mg/m² on days 1 and 2 of a 28-day cycle, up to 6 cycles; dose modification required for toxicity.

Non-Hodgkin’s Lymphoma

IV (Adults): 120 mg/m² on days 1 and 2 of a 21-day cycle, up to 8 cycles; dose modification required for toxicity.

NURSING IMPLICATIONS

Assessment

● Monitor for bone marrow depression. Assess for bleeding (bleeding gums, bruising, petechiae, guaiac stools, urine, and emesis) and avoid IM injections and taking rectal temperatures if platelet count is low. Apply pressure to venipuncture sites for 10 min. Assess for signs of infection during neutropenia; anemia may occur; monitor for increased fatigue, dyspnea, and orthostatic hypotension.

● Monitor for symptoms of infusion reactions (fever, chills, pruritus, rash). May rarely cause severe allergic and anaphylactic reactions, especially in second and subsequent cycles. Discontinue therapy if severe reactions occur.

NURSING IMPLICATIONS
occur. Ask patient about symptoms suggestive of infusion reactions after first cycle of therapy. Consider discontinuation of therapy in patients who previously experienced Grade 1 or 2 reactions. Consider discontinuation of therapy in patients with Grade 3 or 4 reactions.

Assess for skin reactions (rash, toxic skin reactions, bullous exanthema). Withhold or discontinue therapy if reactions are progressive or severe. If non-hematologic toxicity is Grade 3, reduce dose to 50 mg/m$^2$ on Days 1 and 2 of each cycle.

Monitor intake and output, appetite, and nutritional intake. Assess for nausea and vomiting. Administration of an antiemetic before and during therapy and adjusting diet as tolerated may help maintain fluid and electrolyte balance and nutritional status.

Monitor IV site for redness, swelling, pain, infection, and necrosis frequently during and after infusion. Extravasation may cause erythema, marked swelling, and pain.

Lab Test Considerations: Monitor CBC with differential and platelet counts before and during therapy. The hematologic nadirs occur wk 3. Recovery usually occurs in 28 days. Withhold dose and notify physician if ANC is $<10^9$/L and platelet count is $<100,000$ $/10^9$/L.

Potential Nursing Diagnoses

- Risk for infection (Side Effects)

Implementation

- **High Alert:** Fatalities have occurred with chemotherapy agents. Before administration, clarify all ambiguous orders, double check angle, date, and course of therapy dose limits; second practitioner independently double-check original order, calculation, and infusion pump settings.

IV Administration

- **pH:** 2.5–3.5
- Prepare solution in a biologic cabinet. Wear gloves and safety glasses while handling medication. Discard equipment in designated containers.
- **Intermittent Infusion:** Diluent: Withdraw volume needed and transfer to $500$ mL of $0.9\%$ NaCl or $2.5\%$ dextrose/0.45\% NaCl at ambient temperature. Solution should be clear, colorless to pale yellow. Do not administer solutions that are discolored or contain a precipitate. Concentration: $0.2$–$0.7$ mg/mL.
- Diluted solution is stable for $2$ hr when refrigerated or $1$ hr at body temperature; administration must be completed within this period. Solution contains no preservatives; discard unused solution.
- **Rate:** Chronic Lymphocytic Leukemia—Administer $100$ mg/m$^2$ over $30$ min. Non-Hodgkin’s Lymphoma—Administer $120$ mg/m$^2$ over $60$ min.

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

Patient/Family Teaching

- Instruct patient to notify health care professional if fever, chills, sore throat; signs of infection; lower back or side pain; difficult or painful urination; shortness of breath; fatigue; bleeding gums; bruising; petechiae; or blood in urine, stool, or emesis occurs. Caution patient to avoid crowds and persons with known infections. Instruct patient to avoid soft toothbrushes and electric razors. Caution patient to avoid alcoholic beverages and products containing aspartame (NutraSweet) or Saccharin. Instruct patient to notify health care professional immediately if symptoms of allergic reactions (rash, facial swelling, or difficulty breathing) or nausea, vomiting or diarrhea occur.

- May cause tiredness. Caution patient to avoid driving and other activities requiring alertness until response to medication is known.
- Instruct patient not to receive any vaccinations without advice of health care professional.
Continued

Bendamustine

- Advise patient this medication may have teratogenic effects. Contraception should be used by both men and women during and for at least 3 mos following completion of therapy. Advise women not to breast feed during therapy.

Evaluation/Desired Outcomes

- Improvement in hematologic parameters.

Why was this drug prescribed for your patient?