chlorambucil (klor-am-byoo-sill)

Leukeran

Classification
Therapeutic: antineoplastics, immunosuppressants
Pharmacologic: alkylating agents

Indications
Management of chronic lymphocytic leukemia, malignant lymphoma, and Hodgkin’s disease (alone and in combination with other agents).

Action
An alkylating agent that interferes with cellular protein synthesis (cell-cycle phase–nonspecific). Therapeutic Effects: Death of rapidly replicating cells, particularly malignant ones.

Pharmacokinetics
Absorption: Rapidly and completely absorbed from the GI tract.
Distribution: Crosses the placenta.
Protein Binding: 99%.
Metabolism and Excretion: Extensively metabolized by the liver.
Half-life: 1.5 hr.

TIME/ACTION PROFILE (effects on WBCs)

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<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
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<td>PO</td>
<td>7–14 days</td>
<td>7–14 days</td>
<td>14–28 days</td>
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Contraindications/Precautions
Contraindicated in: Hypersensitivity; Previous resistance; OB, Lactation: Can cause fetal or neonatal harm; avoid becoming pregnant; do not breast feed.

Use Cautiously in: Infection; Other chronic debilitating diseases; Geri: More sensitive to effects.

Adverse Reactions/Side Effects
Resp: pulmonary fibrosis.
GI: nausea, stomatitis (rare), vomiting.
GU: decreased sperm count, sterility.
Derm: alopecia (rare), dermatitis, rash.
Hemat: leukopenia, anemia, thrombocytopenia.
Metab: hyperuricemia.
Misc: allergic reactions, risk of second malignancy.

Interactions
Drug-Drug: Additive bone marrow depression with other bone marrow depressants (antineoplastics) or immunosuppressant agents. May prolong antibody response to live-virus vaccines and the risks of adverse reactions.
Drug-Natural Products: Concomitant use with astragalus, echinacea, and melatonin may interfere with immunosuppression.

Route/Dosage
PO (Adults): 0.1–0.2 mg/kg/day (3–6 mg/m²/day) (usual range 4–10 mg/day as a single dose or in divided doses), then adjust dose on basis of blood counts; or 0.4 mg/kg (12 mg/m²) twice weekly. ↑ by 0.1 mg/kg (3 mg/m²) q 2 wk, then adjusted as necessary.
PO (Geriatric Patients): Initial dose should not be more than 2–4 mg/day.
PO (Children): 0.1–0.2 mg/kg/day (4.5 mg/m²/day) single dose or in divided doses.

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 intake and output ratios and daily weights. Report significant changes in totals.
- Monitor for symptoms of gout (increased uric acid, joint pain, edema). Encourage patient to drink at least 2 L of fluid/day. Allopurinol may be given to decrease uric acid levels. Alkalinization of urine may be ordered to increase excretion of uric acid.
- Monitor for symptoms of post (increased sex and joint pain, edema). Encourage patient to drink at least 2 L of fluid/day. Allopurinol may be given to decrease uric acid levels. Alkalinization of urine may be ordered to increase excretion of uric acid.
- Lab Test Considerations: Monitor CBC and differential before and weekly during course of therapy. Report significant drops in granulocyte count. Leukopenia usually occurs around the 3rd week of therapy and persists for 1–2 wk after a short course of therapy. The nadir of leuko-
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Thrombocytopenia occurs in 7–14 days after a single high dose, with recovery in 2–3 wk. The neutrophil count may decrease for 10 days after last dose. Monitor platelet count throughout therapy. Thrombocytopenia usually occurs around the 3rd wk of therapy and persists for 1–2 wk after a short course of therapy. The nadir of thrombocytopenia occurs in 1–2 wk after a single dose, with recovery in 2–3 wk. Institute thrombocytopenia precautions if platelet count is <150,000/mm³.

- Monitor liver function tests, BUN, serum creatinine, and uric acid before and periodically during course of therapy. May cause elevated ALT and alkaline phosphatase, which may reflect hepatotoxicity.

Potential Nursing Diagnoses

- Risk for injury (Side Effects)
- Risk for infection (Side Effects)

Implementation

- **High Alert:** Fatalities have occurred with chemotherapeutic agents. Before administering, clarify all ambiguous orders; double check single, daily, and course-of-therapy dose limits; have second practitioner independently double check original order and dose calculations.
- **High Alert:** Do not confuse Leukeran (chlorambucil) with Alkeran (melphalan), Myleran (busulfan), or leucovorin.

- **PO:** Administer oral medication either 1 hr before or 2 hr after meals. Can be compounded into a suspension by pharmacist for patients who have difficulty swallowing.

Patient/Family Teaching

- Instruct patient to take medication exactly as directed, even if nausea or vomiting is a problem. Consult health care professional if vomiting occurs shortly after dose is taken. If a dose is missed and the medication is ordered daily, take when remembered later that day. If ordered more frequently, take as soon as possible unless almost time for next dose. Do not double doses.
- Instruct patient to report unusual bleeding or bruising. Advise patient of thrombocytopenia precautions (use soft toothbrush, electric razor, and avoid falls; do not drink alcoholic beverages or take medication containing aspirin or NSAIDs because they may precipitate gastric bleeding).
- Instruct patient to inspect oral mucosa for redness and ulceration. If mouth sores occur, advise patient to use sponge brush and rinse mouth with water after eating and drinking. Sessamine may require treatment with opioid analgesics.
- Instruct patient to avoid crowds and persons with known infections. Health care professional should be informed immediately if symptoms of infection (fever, sore throat, chills, cough, diarrhea, lower back or side pain, difficult or painful urination) or rash occurs.
- Instruct patient to inspect oral mucosa for redness and ulceration. If mouth sores occur, advise patient to use sponge brush and rinse mouth with water after eating and drinking.
- Sessamino may require treatment with opioid analgesics.
- Advise patients on long-term therapy to monitor health care professional immediately if cough, shortness of breath, and fever occur.
- Instruct patient to inform health care professional if nausea and vomiting persist. Antinausea medications may be used, although these side effects usually last less than 1 day and tend to decrease with continued therapy.
- Discuss with patient the possibility of hair loss. Explore methods of coping.
- This drug may cause irreversible gonadal suppression; however, patient should still use birth control. Instruct patients to inform health care professional if pregnancy is suspected.
- Instruct patient not to receive any vaccinations without advice of health care professional.

Evaluation/Desired Outcomes

- Improvement of hematopoietic values in leukemia.
- Decrease in size and spread of the tumor. Therapeutic effects are usually seen by the 3rd week of therapy.

Why was this drug prescribed for your patient?