cimetidine (sy-me-ti-deen)

Diseases: Gastritis, Peptic Ulcer Disease

Classification
Therapeutic: Histamine H2 antagonists
Pharmacologic: Antagonists, histamine H2

Pregnancy Category B

Indications

Unlabeled Use: Management of GI symptoms associated with the use of NSAIDs. Management of urticaria.

Action
Inhibits the action of histamine at the H2-receptor site located primarily in gastric parietal cells, resulting in inhibition of gastric acid secretion.

Therapeutic Effects:
- Healing and prevention of ulcers.
- Decreased symptoms of gastroesophageal reflux.
- Decreased secretion of gastric acid.

Pharmacokinetics
Absorption: Well absorbed following oral administration.
Distribution: Enters breast milk and cerebrospinal fluid.
Metabolism and Excretion: 30% metabolized by the liver; remainder is eliminated unchanged by the kidneys.
Half-life: 2 hr.

TIME/ACTION PROFILE
ROUTE ONSET PEAK DURATION
PO 30 min 45–90 min 4–5 hr

Contraindications/Precautions
Contraindicated in: Hypersensitivity; Oral liquid contains alcohol and should be avoided in patients with known intolerance.

Use Cautiously in: Renal impairment (may lead to ↑ blood levels and toxicity with the following—some benzodiazepines (especially chlordiazepoxide, diazepam, and midazolam), some beta blockers (labetalol, metoprolol, propranolol), caffeine, calcium channel blockers, carbamazepine, chloroquine, lidocaine, metronidazole, pentoxifylline, phenytoin, prednisone, quinidine, methotrexate, theophylline, trimethoprim-sulfamethoxazole, and warfarin). May ↑ the effects of succinylcholine, flecainide, procainamide, carbamazepine, and furosemide (↑ absorption). Drug-Natural Products: ↑ caffeine levels and side effects with caffeine-containing herbs (cola nut, guarana, mate, tea, coffee).

Route/Dosage
PO (Adults): Short-term treatment of active ulcers—100 mg 4 times daily or 800 mg at bedtime (not to exceed 8 g/day). Duodenal ulcer prophylaxis—300 mg twice daily or 400 mg at bedtime. GERD—800–1600 mg/day in divided doses. Gastric hypersecretory conditions—300–600 mg of 12 hr (up to 12 g/day have been used). Oesophageal cancer—up to 2400 mg may be taken twice daily (for no more than 1 wk).
PO (Children): Short-term treatment of active ulcers—20–40 mg/kg/day in 4 divided doses.

Renal Impairment
PO (Adults): 50 mg q 6–12 hr. Further adjustment may be required for concurrent hepatic impairment.
PO (Children): 10–15 mg/kg/day given in divided doses q 6–12 hr.

Adverse Reactions/Side Effects

Interactions
Drug-Drug: Cimetidine inhibits drug-metabolizing enzymes in the liver; may lead to ↑ blood levels and toxicity with the following—some benzodiazepines (especially chlordiazepoxide, diazepam, and midazolam), some beta blockers (labetalol, metoprolol, propranolol), caffeine, calcium channel blockers, carbamazepine, chloroquine, lidocaine, metronidazole, pentoxifylline, phenytoin, prednisone, quinidine, methotrexate, theophylline, trimethoprim-sulfamethoxazole, and warfarin. May ↑ the effects of succinylcholine, flecainide, procainamide, carbamazepine, and furosemide (↑ absorption). Drug-Natural Products: ↑ caffeine levels and side effects with caffeine-containing herbs (cola nut, guarana, mate, tea, coffee).

Other Information
Use: Cimetidine, one of the histamine H2 receptor antagonists, has been used widely for over three decades. It is available in numerous formulations and is used in the treatment of many GI disorders. Cimetidine is known to inhibit cytochrome P450 isoenzyme activity to various degrees. Cimetidine is a potent and highly selective H2 receptor antagonist with a high bioavailability (90% absorption following oral administration). It is well absorbed and distributed throughout the body with plasma protein binding of 99%. Cimetidine is metabolized in the liver to inactive metabolites and is excreted primarily by the kidneys. The drug has a short half-life (2 hr) and is eliminated through the bile and feces. Cimetidine is a non-competitive H2 receptor antagonist that inhibits gastric acid secretion by blocking the action of histamine at the H2-receptor site located primarily in gastric parietal cells. This inhibition leads to decreased production of gastric acid and decreased symptoms of GERD, peptic ulcer disease, and drug-induced gastric ulcers. Cimetidine is available in a sustained-release form and can be used for long-term therapy in patients with GERD. It is important to monitor patients for potential adverse effects, particularly in patients with renal impairment, and to adjust the dosage based on renal function. Cimetidine should be used cautiously in elderly patients, as they may be more sensitive to the adverse effects of the drug.
2 NURSING IMPLICATIONS

Assessment
- Assess patient for epigastric or abdominal pain and frank or occult blood in the
  stool, stools, or gastric aspirate.
- Lab Test Considerations: Monitor CBC with differential periodically
  throughout therapy.
- Antagonize effects of pentagastrin and histamine during gastric acid secretion test-
  ing, avoid administration 24 hr preceding the test.
- May cause false negative results in skin tests using antigenic extracts. Histamine H
  antagonists should be discontinued 24 hr prior to the test.
- May cause severe transaminitis and serum creatinine.

Potential Nursing Diagnoses
Acute pain (Indications)
Deficient knowledge, related to medication regimen (Patient/Family Teaching)

Implementation
- If antacids or sucralfate are used concurrently for relief of pain, avoid administration
  of antacids within 30 min to 1 hr of cimetidine and take sucralfate 2 hr after
  cimetidine. Also decrease the absorption of cimetidine.
- PO: Administer with meals or immediately afterward and at bedtime to prolong ef-
  fect. Doses administered once daily should be administered at bedtime to prolong ef-
  fect.
- Cimetidine tablets have a characteristic odor.
- Shake oral suspension prior to administration. Discard unused suspension after
  30 days.

Patient/Family Teaching
- Instruct patients to take medication as directed for the full course of therapy, even if
  feeling better. Take missed doses as soon as remembered but not if almost time for
  next dose. Do not double doses.
- Advise patients taking OTC cimetidine preparations must take the maximum dose
  continuously for more than 2 wk without consulting health care professional. So-
  tify health care professional if difficulty swallowing occurs or abdominal pain per-
  sists.
- Inform patient that smoking interferes with the action of histamine antagonists.
  Encourage patient to quit smoking or at least not to smoke after last dose of the
day.
- May cause drowsiness or dizziness. Cautions patient to avoid driving or other activi-
  ties requiring alertness and response to the drug is known.
- Advise patient to avoid alcohol, products containing aspirin or NSAIDs, and foods
  that may cause an increase in GI irritation.
- Inform patient that increased fluid and fiber intake and exercise may minimize
  constipation.
- Advise patient to report onset of black, tarry stools, fever, sore throat, bloating,
  diarrhea, rash, confusion, or hallucinations to health care professional promptly.

Evaluation/Desired Outcomes
- Decrease in abdominal pain, heartburn, acid indigestion, and sour stomach.
- Prevention of gastric irritation and bleeding. Healing of duodenal ulcers can be
  seen by endoscopy. Therapy is continued for at least 6 wk in treatment of ulcers
  but may usually be longer than 6 wk.
- Decreased symptoms of esophageal reflex.

Why was this drug prescribed for your patient?