Methimazole is a popular antithyroid drug used for treating hyperthyroid cats in the U.S., particularly when radioiodine is not readily available or is cost prohibitive.

Overview

Methimazole is approved for use in animals (Felimazole; dechra-us.com) and humans.

Methimazole compounded with pluronic lecithin organogel (PLO) is one of few veterinary drugs with demonstrated efficacy when administered transdermally.

— Concentration: 50 mg/mL
— Starting dose: 2.5 mg/cat q12h

Toxicities

Dose-dependent

• In 10%–20% of cats treated with oral methimazole, mild-to-moderate vomiting, diarrhea, and decreased appetite typically developed during the first 4 weeks of treatment.1,2
  — GI signs are significantly less common in cats receiving transdermal treatment than in those receiving oral methimazole.1

• Cats often develop mild increases in BUN and creatinine with treatment to the euthyroid state.3
  — Low urine specific gravity and high serum thyroxine (T\textsubscript{4}) concentrations may increase risk for posttreatment development of azotemia,4 although cats with highly concentrated urine can still be at risk.5
  — Serum T\textsubscript{4} concentrations should be targeted to the mid-normal range, as overtreatment to low serum T\textsubscript{4} can worsen azotemia and lead to shortened survival times.6

Idiosyncratic

• Acute, apparently nondose-dependent (ie, idiosyncratic) toxicities can develop at 1–4 weeks of treatment and typically include
  —Facial excoriation around the neck and pinnae, blood dyscrasia (eg, neutropenia, thrombocytopenia), and new hepatopathy
  — Leukopenia resulting from only lymphopenia does not indicate methimazole discontinuation.

• Idiosyncratic hepatopathy is typically a mixed pattern (ie, with elevations in both hepatocellular and cholestatic enzymes) and may involve hyperbilirubinemia.
  — Liver enzyme activity should be compared with values obtained before treatment, as many hyperthyroid cats have elevated ALT and/or ALP at diagnosis.7
  ▪ These should resolve with treatment.

• Cats may develop myasthenia gravis, characterized by neuromuscular weakness and positive acetylcholine receptor autoantibodies during the first few months of treatment8,9; however, this is rare.
Management of Adverse Events

⚠️ For simple GI upset without biochemistry abnormalities, discontinue methimazole until signs resolve.
- Restart at a 50% dose reduction or switch to transdermal methimazole.¹

⚠️ Idiosyncratic toxicities fail to respond to dose reduction.
- Discontinue methimazole and schedule alternative treatment (eg, radioiodine, Hill’s Prescription Diet y/d Feline Thyroid Health [hillsvet.com], thyroidectomy).
  - For facial excoriation and if pruritus is severe, consider short-term antiinflammatory doses of prednisolone.
  - For blood dyscrasia, evaluate for fever or bruising.
  - Neutropenia and thrombocytopenia will typically resolve after drug discontinuation without additional intervention.¹⁰

▶️ In cases of severe neutropenia (ie, <1000–1500 µL), antibiotics (eg, amoxicillin–clavulanate) may be indicated.
▶️ Recheck CBC 1 week after discontinuation.
  - For hepatopathy, consider short-term treatment with glutathione precursor (eg, S-adenosylmethionine [SAMe])
  - Recheck liver enzyme activity 1–2 weeks after discontinuation.
  - For myasthenia gravis, consider pyridostigmine treatment.
  - Follow clinical response and acetylcholine receptor antibody titers after discontinuation.

Monitoring

⚠️ Clinical monitoring by owners is important, as toxicities can develop between routine re-checks.

▶️ Rechecks at 2 and 4 weeks after treatment initiation should be sufficient to determine euthyroidism and presence of toxicity.
- Along with monitoring serum T₄ concentrations and general clinical status, cats should be monitored for
  - New azotemia via BUN, creatinine, and urine specific gravity
  - Idiosyncratic toxicity via CBC and liver enzyme activities
- Once euthyroid state reached, routinely (q3–6mo) check renal values, blood pressure, and serum T₄ concentrations.

Methimazole is one of few veterinary drugs with demonstrated efficacy in a compounded formulation for transdermal administration.


SUGGESTED READING


REFERENCES


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