

Key Points

- Hyperthyroidism in cats is almost always result of adenomatous hyperplasia or a benign adenoma
- Hypertension is not as common as once thought, so other causes for hypertension in a hyperthyroid cat should be investigated
- Hyperthyroidism can mask CKD and careful monitoring is important
- Transient subclinical or clinical hypocalcemia is an important concern for post-surgical thyroidectomies
- Methimazole is the medical treatment of choice for cats, but can cause transient severe blood dyscrasias

Causes of hyperthyroidism

- Adenoma or adenomatous hyperplasia
 - Clinically equivalent
 - Vast majority of cases
- Thyroid carcinoma
 - 1-3%

Risk Factors

- Multifactorial (lots of studies say different things)
- Eating canned diet increases risk

Clinical Features of Feline Hyperthyroidism

- Mean age of onset = 13 years
 - Rare < 8 years old
 - Purebreds are underrepresented
- Progressive, insidious disease for the most part
 - Weight loss despite good appetite***
 - Increased activity
 - PU/PD
 - Vomiting
 - Diarrhea

BOX 4-1 Differential Diagnosis for Cats with Polyphagia and Weight Loss

Hyperthyroidism
Diabetes mellitus
Poor quality or insufficient diet
Gastrointestinal disease

- Malabsorption (inflammatory bowel disease, gastrointestinal lymphoma, gastrointestinal parasitism)
- Maldigestion (exocrine pancreatic insufficiency)

Hyperadrenocorticism

Mech of PU/PD

- Primary PD
 - Leads to downreg of aquaporin 1 and 2
- Increased GFR

Mech of Resp distress

- Respiratory muscle weakness
- Enhanced ventilatory drive
- Decreased pulmonary compliance
- Concurrent diseases

Heart changes

- Heart is sensitive to effects of thyroid hormone
 - Tachycardia
 - Increased sympathetic and decreased parasympathetic tone
 - Cardiac output is increased
 - Tachycardia
 - Increased ejection fraction
 - Increased systolic function due to gene activation of T_3
 - Increased blood volume
 - Decreased vascular resistance
 - Vasodilatory effect of T_3
 - Activates RAAS
 - Increased oxygen demand of peripheral tissues leads to cardiac dilation and hypertrophy

Thyroid Storm

- Usually combination of infection, non-thyroidal illness, or withdrawal of antithyroid medications
 - Four clinical signs required (in humans)
 - Fever
 - CNS manifestations
 - Gastrointestinal or hepatic dysfunction
 - Cardiovascular signs such as tachycardia, a-fi

Diagnostics

- Chem
 - Mild to moderate increases in ALT and ALP
- UA
 - Proteinuria is possible
 - Thought to be proteins other than albumin
 - Resolves after treatment

- However presence prior to treatment is associated with reduced survival
- UTIs more common
- Possible ketonuria

Thyroid hormone

- Total T₄ is most useful for diagnosis
 - Non-thyroidal illness also affects T₄ concentrations in cats
 - Sen 91%, Sp 100%

Treatment

- Estimated 40% of hyperT cats have CKD
 - Treatment can uncover CKD
 - Pretreatment normal BUN and UGS >1.035 are unlikely to develop azotemia after treatment
 - Pre-definitive treatment trial with methimazole recommended
 - If CKD present, continue medical management titrated to 'least harmful' disease balance
- Methimazole
 - Reversibly inhibits thyroid hormone synthesis
 - Can be administered transdermal
 - Mild side effects are common (up to 25%)
 - Usually within 4-8 weeks of start of treatment
 - Direct gastric irritation
 - Facial excoriations
 - May improve after glucocorticoids
 - Eosiniphilia, lymphocytosis, mild leukopenia
 - Uncommon side effects
 - Severe thrombocytopenia resulting in bleeding
 - Neutropenia <500/uL
 - Fever, lethargy, local or systemic infection
 - Cessation of drug usually results in resolution of signs within 1 week
 - Possibly immune mediated
 - Rare effects
 - Vit-k dependant coag factor interference
 - Did not result in PT prolongation in these cats
 - PIVKA more senesitive

Anesthesia of hyperthyroid cats

- Avoid drugs that potentiate adrenergic activity as well as anticholinergic drugs

Postsurgical management of thyroidectomy

- Monitor for hypocalcemia

- Once daily for 4-7 days
- Mild transient hypocalcemia is common
- If clinical:
 - Treat with IV calcium
 - Oral vit D and calcium supplementation
- Some cats have hypocalcemia lasting days, others have it the rest of their life

Other treatments

- Beta blockers
 - For cats that do not tolerate anti-thyroid drugs to help slow heart rate

Questions:

1. What is the most common side effects of methimazole treatment
 - a. Neutropenia <500k
 - b. Thrombocytopenia resulting in bleeding
 - c. Prolongation of PT
 - d. Facial excoriations

2. What is the recommended screening test for cats for hyperthyroidism
 - a. Baseline T3
 - b. Free T4
 - c. Baseline T4
 - d. Thyroid scintigraphy

3. What urological related diagnostic finding in a cat with hyperthyroidism is expected to resolve after treatment
 - a. Increased BUN
 - b. Proteinuria
 - c. Isosthenuria
 - d. Decreased GFR

4. True/False: Hypertension is a common finding in hyperthyroid cats and can be controlled with beta blockers and/or amlodipine

Answers:

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