Diagnostic utility of serum thyroid-stimulating hormone (TSH) for the diagnosis of iatrogenic hypothyroidism in cats treated with radioiodine therapy

Purpose
To evaluate the accuracy of TSH in diagnosing hypothyroidism in cats that have received radioiodine treatment for hyperthyroidism.

Background
Hyperthyroidism, an overactive thyroid gland, is one of the most common diseases diagnosed in older cats. Treatment of hyperthyroidism can lead to decreased thyroid function (hypothyroidism) in up to 30% of cats. Hypothyroidism is associated with an increased rate of kidney disease and shorter survival times in cats. Thyroid hormone levels in the blood are widely used for the diagnosis of hyperthyroidism and hypothyroidism. When a cat is treated for hyperthyroidism, it is important to ensure that the treatment doesn’t cause hypothyroidism. The best test to determine hypothyroidism in cats is unknown. Thyroid hormone levels can be falsely lower due to illness, such as chronic kidney disease. Unfortunately, up to 40% of cats will develop kidney disease after treatment, making interpretation of thyroid tests problematic. We seek to evaluate the accuracy of another thyroid hormone called thyroid-stimulating hormone (TSH) in diagnosing hypothyroidism after radioiodine treatment. This information will help determine how we diagnose hypothyroid cats and identify cats that may benefit from potentially life-saving thyroid hormone supplementation.

Eligibility
Three groups of cats will be included in the study.
1. Cats who have received radioiodine therapy. We will include cats in the study 3 months after they have received treatment.
2. Healthy cats. Cats who are clinically healthy based on previous examination and blood work (complete blood count, biochemistry, urinalysis) and are 6 years or older.

Exclusion
- Concurrent disease other than Chronic Kidney Disease (CKD).
- Significant abnormalities on physical exam, complete blood count, biochemistry, urinalysis besides those associated with CKD.
- Taking glucocorticoids, phenobarbital, sulfonamides, insulin, furosemide, NSAIDs, or clomipramine.

Study Design
Healthy and CKD cats: Healthy cats and cats with kidney disease will have blood taken to assess thyroid function. Cats will also undergo a routine physical examination. Blood work and physical examination will be performed again in 3 months if cats remain in the study.

Radioiodine cats: In addition to blood work and a physical exam, cats who have received radioiodine therapy will also have a thyroid scan performed 3 months after treatment. This procedure will be performed under brief sedation if necessary. This procedure will be the same as the one performed during initial screening for radioiodine therapy. Standard sedation risks apply to cats that require sedation for thyroid scan. Cats will be considered radioactive for 24 hours and will be hospitalized during that time.

Compensation
Healthy and CKD cats: Owners will be responsible for costs associated with screening blood work (complete blood count, biochemistry, urinalysis) to determine if the cats are healthy or have kidney disease. Costs of initial thyroid testing will be covered by the study in addition to examination fees, thyroid testing, and biochemistry 3 months after initial testing.
Radioiodine cats: Owners are responsible for costs associated with 131I therapy, including screening and the treatment itself. 131I therapy typically costs $1,500 at our hospital. The cost of all tests associated with the study are covered. In addition, the study will provide $75 compensation for participation in the study.

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