

Feline Hyperthyroidism- Skinny old cats- how to deal with them

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Cats are living longer. Perhaps this is because they are more likely to be included as family members than in the past, perhaps we as a profession are doing a better job keeping them alive longer. Whatever the reason, when kept primarily indoors, cats can live to be upwards of 20 years old. Because of this, geriatric medicine, and the need to balance multiple disease processes has become a necessary part of treating these old cats.

Hyperthyroidism is the most common endocrinopathy in cats greater than 8 years of age. The youngest cat reported with the disease was 4 years old, however the mean is approximately 13 years, with greater than 95% of all hyperthyroid cats being over 8 years old. Typical clinical signs include weight loss, polyphagia, an unkempt coat, polyuria, polydipsia, vomiting, and diarrhea. Unfortunately, the clinical signs of many other diseases of geriatric cats mimic these signs, and can lead to a confusing clinical picture. Common concurrent diseases for the age group include renal failure, gastrointestinal disease (in particular GI lymphoma), cardiac disease, and extra gastrointestinal neoplasia. To further complicate the clinical picture, there are a significant number of hyperthyroid cats that have a decreased appetite (“apathetic” hyperthyroidism).

Diagnosis of hyperthyroidism

The diagnosis of hyperthyroidism is not a difficult one to make. The suspicion arises from typical clinical signs in the history, along with classic physical examination findings; weight loss, unkempt coat, gallop rhythm, tachycardia, and the palpation of a thyroid nodule. A random serum T4 level is an extremely reliable diagnostic test for making the diagnosis. If a cat presenting clinically as hyperthyroid has a normal T4, simply rechecking the T4 in one to two weeks will usually make the diagnosis, due to fluctuations in the thyroid hormone blood levels. Additionally the presence of concurrent non-thyroidal illness will cause a suppression of increased hormone concentration. Cats that are severely ill with non-thyroidal illness should have a low or non-detectable T4. If the T4 in such a cat measures in the high normal range, that cat is probably hyperthyroid as well as it's other disease(s). Although T3 is the biologically active thyroid hormone in dogs and cats, as many as 25% of cats with confirmed hyperthyroidism have a normal T3 level, and there is no real advantage of measuring both thyroid hormones over just measuring serum T4. Free T4 (by ED) can be useful when the total T4 is in the gray zone. The “gold standard” for confirming the diagnosis of feline hyperthyroidism is a thyroid scan using a radionuclide (pertechnetate, I131, and I123). In addition to making the diagnosis, thyroid scans have the advantage of showing a solitary unilateral nodule, vs. bilateral disease, and can show metastasis or ectopic thyroid tissue.

Complications of hyperthyroidism

In addition the clinical signs of weight loss, increased thirst, appetite changes, GI signs of vomiting and diarrhea, untreated hyperthyroidism can cause several life threatening sequela. In particular the cardiovascular system is very prone to secondary effects of

thyrotoxicosis. Physical exam changes can include tachycardia, gallop rhythm, murmur, and premature contractions with associated pulse deficits. Secondary hypertrophic changes to the heart can eventually lead to congestive heart failure, (pulmonary edema, pleural effusion, or ascites). Hyperthyroid cats also have impaired tolerance to stress- they are very fragile and can develop respiratory distress, weakness or even cardiac arrest from the stress of just a physical examination or a blood draw- so care must always be used when any diagnostic or therapeutic procedures are considered.

Treatment options

Treatment options for hyperthyroidism include oral methimazole, transdermal methimazole, surgery or radioactive iodine therapy. Because reversal of the hyperthyroid state can alter renal blood flow, there is some real concern of “unmasking” sub clinical or mild renal insufficiency or failure with correction of the hyperthyroid state. Because of this, a temporary treatment (methimazole) is recommended for cats whose pre treatment urine specific gravity (USG) is <1.040. If a cat has a concentrated urine sample (>1.040) while they are hyperthyroid, they are unlikely to have any significant degree of renal dysfunction, and a permanent therapy (radioactive iodine or surgery) can be considered right away. For cats with more dilute urine (<1.040) on their prescreening laboratory evaluation, a temporary therapy should be started, and then the urine concentration re-evaluated once they are euthyroid for at least 2 weeks. If they then have adequate urine concentration ability, they are good candidates for a permanent therapy.

Methimazole treatment

Methimazole is a drug with many potential side effects and associated problems. These can be severe, even life threatening (although rarely). They are usually very concerning to owners, especially when the cat may have not seemed ill prior to starting the medication. The good news is that these side effects are virtually always reversible with discontinuation of the drug. The dosage protocol that I recommend is more conservative than some, however the side effects seem to be decreased when the drug is started at a very low dose and gradually increased over time. Depending on the cat and each individual's circumstances, I may start as low as ¼ of a tablet (1.25mg) twice per day for two weeks. If the cat is otherwise well, with no sign of non-thyroidal disease, I recommend starting at 2.5mg (1/2 tablet) orally twice per day. Regardless of the dose, I recommend re-evaluating them (including a physical examination, body weight, CBC, chemistry panel, T4 and USG) in 2 weeks. If the T4 is still above the normal range (which it often is starting on the lower dose), I gradually increase the dose (by 2.5mg/day) each 2 weeks until their T4 is normal. Clinical signs of hyperthyroidism may take 2-6 weeks after achieving normalization of the T4 to resolve. The dose range required for each cat is variable; some take 5mg/day, some up to 15mg/day. If a cat is seemingly “resistant” to methimazole (requiring upwards of 20mg/day without normalization of the T4), administration error should be investigated. Are the owners feeding the cat the pill? Often in the beginning of therapy- this works well because the cat is so ravenous, however once its T4 decreases some, it may simply eat around the pill. Is the cat spitting the pill out? We all know that some cats can be very difficult- sometimes impossible to medicate orally. Fortunately, methimazole has a good transdermal

administration, and is readily available at compounding pharmacies. Dosing transdermal methimazole is the same as for the oral form.

Side effects of methimazole will typically occur during the first 1-2 months of therapy. Owners may report anorexia, vomiting, and lethargy- with normal CBC and chemistry panels, and a T4, which may be still elevated, or in the normal range. Often the signs are very significant- the cat becomes flat. The occurrences of these signs are minimized with a lower starting dose, and a gradual increase. Only an extremely small number of cats will continue to have signs regardless of dose. Transdermal administration may also yield less of these types of side effects. Facial excoriations occur in a small number of cats from methimazole, and will respond to discontinuation of the medication and administration of glucocorticoids. Hepatic toxicity/injury occurs in a small number of cats, and may include elevations in serum ALT, ALP, and bilirubin, and can cause the clinical signs of inappetance, vomiting, and lethargy. The hepatopathy may take weeks to months to reverse with discontinuation of the medication. The cat should be supported as indicated necessary based on their signs (IV or SQ fluids, appetite stimulants). Other severe side effects of methimazole include, blood dyscrasias (thrombocytopenia, agranulocytosis) and less commonly, immune mediated hemolytic anemia. If side effects occur, the methimazole should be discontinued until resolution of the abnormality, and then alternate therapy should be considered.

Permanent therapy

Because of the availability in this area, and simplicity of radioactive iodine, surgery is rarely used at our facility as a treatment for feline hyperthyroidism. Complications unique to surgery include general anesthesia (in an already potentially debilitated patient), and postoperative risk of hypoparathyroidism. Surgery is also more costly and less appealing to most owners due to the fear of anesthesia, and because it is a more invasive treatment. Radioactive iodine is minimally stressful to the cat, and is the ideal treatment for the cat which is too ill to undergo surgery or who cannot tolerate methimazole. Radioactive iodine is usually a one time, subcutaneous injection. Other than a five day hospital stay, the cats have very little to endure. The T4 drops rapidly, and most cats return to a normal T4 level in the first two weeks following therapy. Clinical improvement is seen usually in 2-6 weeks. Only a small number (2-4% of all cats) need to be re-treated after radioactive I131. It is rare for a cat to become clinically hypothyroid following therapy, those that do can be treated with L-thyroxine at 0.05-0.1mg orally once to twice per day.

Thanks to Dr. Blaise Burke, we have recently started treated hyperthyroid cats here at the Veterinary Specialty Hospital with radioactive I131. Although Dr. Burke administers and monitors the radiation, all of these cats are evaluated and managed by one of our internal medicine specialists. Prescreening diagnostics that we recommend for all cats, include (minimally) a physical examination, body weight, CBC, chemistry panel, T4, and urinalysis. For cats with evidence of cardiac disease, thoracic radiographs, ECG, blood pressure, and a cardiac ultrasound may also be recommended. For cats with suspect renal or hepatic disease abdominal ultrasound may be recommended. As previously discussed, in cast with USG<1.040, normalization of the T4 (with methimazole) and repeat evaluation of USG is recommended prior to permanent correction of hyperthyroidism to minimize the risk of unmasking sub clinical or early renal failure. If your patient is a

good candidate for radioactive I131 therapy, feel free to call, or have your clients schedule a consultation with one of us. We are recommending discontinuation of methimazole for about 1 week prior to radioactive iodine therapy, but this is not totally necessary. Following discharge from the hospital owners are provided with a list of instructions regarding care of their cats. In general, persons over age 45 are told to stay 3 feet or greater away from the cat except for brief periods needed for care. Persons under 45 years of age should stay greater than 6 feet away from the cat except for brief periods, and children under 18, and pregnant women should have no contact with the cat. Liners should be used in the litter box, and the cat should be contained within the house. Hands should be well washed after handling litter, the cat, or its food dishes. These precautions are simply to minimize unnecessary human exposure to the radioactive iodine, and should be continued for 2-3 weeks following discharge from the hospital. Follow-up monitoring should include a recheck examination and T4 measurement every 2-3 months initially, and once the cat remains euthyroid, and appears stable, recheck evaluations should be completed approximately every 6-12 months.

And to make it more complicated...

One of the most challenging diagnostic problems in small animal medicine is the cat with thyrotoxicosis and another serious illness. Other diseases such as renal failure, primary cardiac disease, intestinal disease, diabetes mellitus, and extra GI neoplasia all occur commonly in aged cats. In addition, the signs of these disorders can mimic or accentuate hyperthyroidism. A thorough history, physical examination, and diagnostic screening tests are needed to evaluate other body systems. The degree of thyroid elevation must be compared with the degree of clinical illness, and history of the cat. For example, a cat presenting with severe weight loss, (with either an increased or decreased appetite), mild renal failure (creatinine of 2.5, BUN 50), and mild elevation in the T4 (4.5), probably has another disease process going on contributing to the weight loss. Further evaluation of these cats is required to determine the ideal treatment plan. These are the cases that require careful discussion with clients, about all of the benefits and risks associated with each of the diseases, diagnostic procedures, therapeutic options, and the risks and benefits of leaving the disease untreated. Many owners don't want to "put the cat through" too much, given their age, and so often the clinician has to perform a balancing act of a multitude of therapies to give the cat the best quality of life. These cats and their owners need a very individualized plan, counseling, and close monitoring.