Feline hyperthyroidism Part Two: Treatment

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ABSTRACT: Feline hyperthyroidism is considered the most common endocrinopathy in cats, with an estimated 10% of senior cats developing the disease. Accurate diagnosis is essential to allow for the most appropriate treatment to be implemented, thereby leading to a mutually beneficial outcome for owner, practitioner and patient. Treatment options include medical management, surgical intervention, dietary modification and radioactive iodine, yet the most suitable protocol can only be determined following thorough analysis of the patient during the diagnostic process as well as the owner's situation.

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Kelly qualified as a VN in 2001 and later completed the BSc top-up in veterinary nursing, gaining a first class honours degree. She has a keen interest in feline internal medicine and domestic animal behaviour. In 2005 she gained the Improve International Nurses Certificate in Animal Behaviour and in 2007 the Improve International Nurses Certificate in Advanced Anaesthesia. Kelly worked as a nurse, assessor and internal verifier in practice until 2008 when she left to pursue a career in teaching, and has since gained her DTLLS. Kelly recently returned to practice as a medicine nurse at the Queen Mother Hospital for Animals

Introduction

This second article of two will explore the challenges facing the practitioner and the veterinary nurse, along with the various treatment methods and their indications for use.

Medical management

In general practice medical management is often perceived as more affordable, however, there are disadvantages:

- length of treatment needs to be considered when analysing cost.
- medical treatment is not curative, requiring continual, lifelong administration.
- The cost of both methimazole and carbimazole has increased due to the introduction of animal-licensed products restricted human drug use.

Thus the long-term cost of medical management may not be dissimilar to radioiodine treatment, should the animal respond well.

It is essential that RVNs involved in the nursing of these patients understand the health and safety implications of handling and dispensing these drugs. Discussion with owners is needed with regard to potential adverse reactions and any contraindications pertaining to their use (BSAVA 2011).

Methimazole and carbimazole are the drugs most commonly used to treat feline hyperthyroidism (Frénais, Rosenberg, Burguad & Horspool, 2009). Their use has many benefits, including:

- reduction of T4 levels prior to surgery
- allowing safer anaesthesia
- reversibility of treatment allowing underlying renal insufficiency to be detected early
- treatment can be ceased if necessary
- affordable by many clients

(Trepanier, 2006).

Methimazole

Dosing once a day with methimazole is thought to be less effective than twice daily administration (Trepanier, 2006) with just over 50% of cats having normal thyroid levels after two weeks of once daily treatment. However, when dosed twice daily, nearly 90% were euthyroid after two weeks of therapy. Thyroxine levels usually return to pre-treatment levels after treatment has been withdrawn for 48 hours regardless of the dosing regime.

It could therefore be concluded that methimazole treatment is preferable to radioactive iodine in some cases and that methimazole is the preferred drug for medical management due to its efficacy and lower incidence of side effects (Trepanier, 2006).

Carbimazole

Carbimazole has been available for several years, traditionally as an immediate-release formulation requiring multiple dosing within a 24 hour period. More recently, a controlled-release formulation of the drug has been made available to practitioners, with the main benefit being once daily dosing. This was perceived as likely to

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increase compliance from owners and subsequently improve control of the disease (Frénais, Burguad & Horspool, 2008). Carbimazole is licensed for use in cats and is a recognised form of treatment for hyperthyroidism (BSAVA, 2011), thus eliminating any ethical concerns.

Renal parameters have been noted to have deteriorated in many cats whilst on controlled-release carbimazole, and this is an area of concern indicating that more research is necessary. Studies comparing the safety and efficacy of this drug formulation in direct comparison to both immediate-release carbimazole and methimazole would be highly beneficial to both practitioners and owners. This also highlights the importance of regular biochemical monitoring of organ function for cats that are receiving anti-thyroid treatment (Frénais, Rosenberg, Burguad & Horspool, 2009).

The safety of carbimazole use, both short- and long-term, requires further ethical exploration and further studies should focus on the need to address and compare the effects of methimazole on long-term organ function and ascertain incidence and severity of haematological changes.

Surgical thyroidectomy

Thyroidectomy is deemed to be an acceptable treatment method for feline hyperthyroidism, as it avoids the potential side effects of anti-thyroid drug therapy. However, thyroidectomies in the cat can be complicated due to size, position and attachment of tumours. Patients should receive anti-thyroid drug therapy prior to surgery so that euthyroidism can be established, thus improving the patient's anaesthetic profile by normalising blood pressure and heart rate. There are two techniques available which allow for extracapsular or intracapsular dissection of the thyroid gland. Parathyroid glands must be left intact with no remnants of thyroid tissue (Birchard, 2006) (**Figure 1**).

Surgery is relatively risk free if appropriate pre-anaesthetic checks are undertaken and results suitably acted upon. Experienced surgeons and appropriate anaesthetic regimes monitored by experienced RVNs are required, and the risk of hyperthyroidism recurring is low if ectopic hyperfunctional thyroid tissue (EHTT) is absent. This highlights the importance of scintigraphy in the pre-operative assessment of patients.

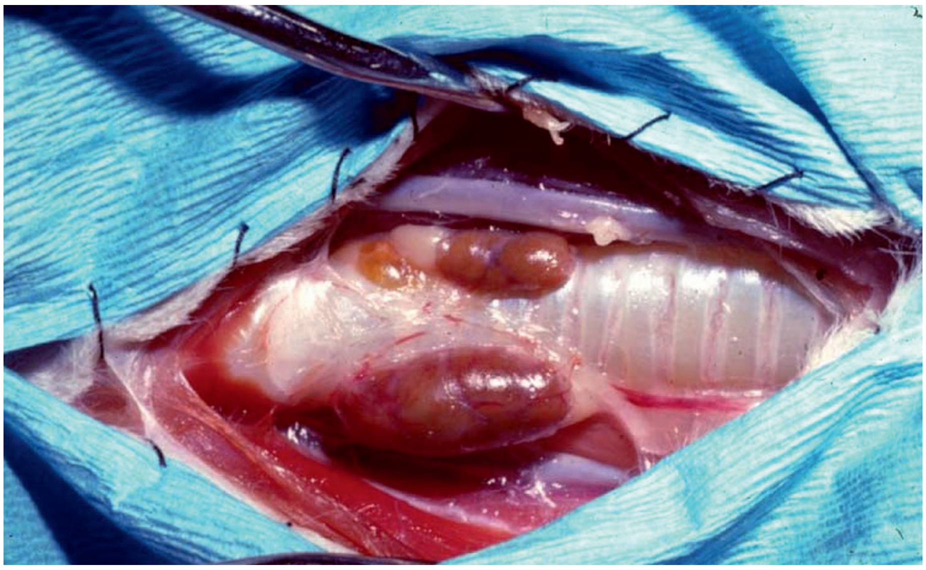

Figure 1. Hyperthyroid cat with one thyroid tumour (bottom of photo) that was clearly large, whereas the other thyroid lobe is equivocally enlarged (top smaller lobe); the final diagnosis was bilateral thyroid disease (bilateral adenomas)

Radioiodine treatment

Radioiodine treatment, if available and affordable, has significant advantages over both medical and surgical treatment, however access to treatment can prove difficult, as few facilities in the UK offer it (Peterson, 2006). No long-term medication is required and post-surgical complications, including hypoparathyroidism and hypocalcaemia, are abolished. Sedation is required in some cases, but general anaesthetic risks are eliminated. Isolation is required for 2–4 weeks following treatment until radioactive levels reduce to acceptable levels, but this can prove upsetting for owners and the patients. RVNs are intensively involved in the care of isolated patients, and their skills and knowledge allow for detection of complications and provision of affection and interaction, albeit that this must be kept to a minimum due to health and safety protocols (**Figure 2**).

Results obtained from past studies promote the use of subcutaneous iodine for treatment of cases of feline hyperthyroidism. A study of 524 hyperthyroid cats showed that 94.2% had a good response to treatment (Peterson & Becker, 1995). Available research supports the idea that radioiodine doses need to

Figure 2. Cats in radioiodine ward following treatment

be tailored to a given individual. The potential for successful treatment reduces if this is not considered.

Dose estimation in the form of a scoring system has been used and described as being advantageous (Peterson, 2006). This scoring system is based upon the severity of clinical signs, T4 concentration and tumour size, supporting the theory that not all affected cats should be treated similarly but rather, they should be individually evaluated. In the study by Peterson and Becker (1995) only 2.1% of 524 cats developed long-term hypothyroidism and 1.5% remained hyperthyroid at six months following treatment. Despite the study not being current, the method of treatment being evaluated is still used in referral practice, and the size of the study group enables results to be extrapolated to the wider population.

It would be beneficial to know if the cats that developed long-term hypothyroidism post treatment had borderline low TT4 prior to treatment and, if so, whether they underwent scintigraphy. However, hypothyroidism may be considered less debilitating than hyperthyroidism and therefore an acceptable risk (Peterson, 2006).

Dietary management

Recently introduced prescription diets specifically formulated to manage cats with hyperthyroidism claim to eliminate the need for any medical management and restore thyroid health in approximately three weeks. As other food sources may contain iodine, the diet must be fed as the sole source of nutrition and has therefore been designed with a geriatric profile (Hill's, 2013).

As there has been some evidence since the 1970s that commercial cat foods have been linked to an increased prevalence of feline hyperthyroidism (Edinboro, Scott-Moncrieff & Glickman, 2010; Peterson, 2013), the introduction of this diet has proved interesting. However, it appears to benefit only those with mild to moderate thyroid disease rather than those with severe hyperthyroidism, and it remains to be seen if the use of an iodine-deficient diet over time will successfully control the disease. The implications of euthyroid cats eating a diet with low iodine levels also needs to be taken into consideration, and this may make the use of the diet impractical in multi-cat households (Peterson, 2013) (**Figure 3**).

Figure 3. Cat in radioiodine ward

Conclusion

It is essential that RVNs and veterinary surgeons involved in patient care are fully aware of the diagnostic tools and treatment options for feline hyperthyroidism. CPD is essential and should be promoted, encouraged and widely available. RVNs should be able to assess relevant literature to enable them to apply evidence-based medicine to improve the quality of their nursing care.

It is important that all patients are viewed as individuals and their temperament should be considered when selecting the appropriate treatment. Aggressive or highly anxious patients may prove unsuitable for particular treatments. Development or adoption of standard operating procedures (SOPs) is essential to guide staff towards consistent clinical excellence and standardised care.

Radioiodine treatment offers the highest success rate, with minimal side effects, but cost and availability of treatment may cause issues for some owners. Scintigraphy should be discussed and ideally performed prior to undertaking radioiodine or surgical thyroidectomy and the overall health of the patient also needs to be considered prior to anaesthesia.

Medical management can prove effective but can be costly in the long term and involves a high level of owner and patient compliance and repetitive testing of T4 levels and organ function whilst time will tell if low-iodine diets can control the disease in the long term without any detrimental effects to the cat's health.

Nursing the hyperthyroid cat definitely bring with it an array of different challenges and success is reliant not only on the expertise of the VS, but the commitment and dedication of the nurses.

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Multiple Choice Questions

1. What percentage of senior cats in the UK are likely to develop feline hyperthyroidism?

(a) 17%

(b) 13%

(c) 12%

(d) 10%

2. Which drugs are commonly used to treat hyperthyroidism?

(a) Methimazole and carbimazole

(b) Meloxicam and carbimazole

(c) Marbofloxicin and clavaseptin

(d) Medetomidine and cimetidine

3. Surgical thyroidectomy :

(a) Is the only way to treat feline hyperthyroidism

(b) Can be complicated due to the size or position of tumours

(c) Eliminates the possibility of hyperthyroidism returning later on

(d) Does not require a general anaesthetic

4. Why should cats with hyperthyroidism receive medical treatment before having a thyroidectomy?

(a) To see if the medication will work better than surgery

(b) To check if the cat will take tablets

(c) To reduce the symptoms of hyperthyroidism before anaesthesia

(d) To confirm the diagnosis of hyperthyroidism

5. What is the main advantage of radioiodine treatment?

(a) It is an inexpensive form of treatment

(b) It is easy to access at any veterinary clinic

(c) It eliminates the need for long term medication

(d) It is easy to administer

6. How long must cats be isolated after recieiving radioiodine treatment?

(a) 4–6 weeks

(b) 2–4 weeks

(c) 3–4 weeks

(d) 6–8 weeks

7. Dietary management of hyperthyroidism is

(a) Using a low iodine diet to treat mild to moderate hyperthyroidism

(b) Using a low calcium diet to treat mild to moderate hyperthyroidism

(c) Using a low sodium diet to treat mild to moderate hyperthyroidism

(d) Using a high iodine diet to treat mild to moderate hyperthyroidism

8. Why should the cat's temperament be taken into account when selecting treatments?

(a) If the cat is anxious or aggressive, some treatments might not be suitable

(b) If the cat is fine they might not need treatment at all

(c) Assessing temperament is an accurate way to assess hyperthyroidism

(d) Assessing the temperament helps to decide which medication to prescribe

9. Which form of treatment offers the best success rate for managing feline hyperthyroidism?

(a) Medical management

(b) Radioiodine treatment

(c) Surgical thyroidectomy

(d) Dietary management

10. Why are standard operating protocols useful in clinical practice?

(a) They help inexperienced staff to learn

(b) They improve the knowledge of owners

(c) They guide staff to consistent clinical excellence

(d) They standardise all care for all patients

For the answers to the MCQs, please go to: http://www.bvna.org.uk/publications/veterinary-nursing-journal