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Hypothyroidism

(Low Levels of Thyroid Hormone)

Basics

OVERVIEW

- Clinical condition that results from inadequate production and release of thyroid hormone by the thyroid gland
- Thyroid hormones are known as “triiodothyronine” or T3 and “tetraiodothyronine” or T4
- Decreased levels of thyroid hormone can affect the body in many ways

GENETICS

- No known genetic basis for the inheritance of primary hypothyroidism in dogs
- Congenital (meaning present at birth) hypothyroidism has been reported in toy fox terriers and giant schnauzers (dogs) and in Abyssinians (cats)

SIGNALMENT/DESCRIPTION OF PET

Species

- Dogs
- Cats—rare

Breed Predilections

- Larger-breed dogs are more likely to develop hypothyroidism
- Breeds reported to have increased likelihood of developing hypothyroidism as compared to other dog breeds include the golden retriever, Doberman pinscher, Great Dane, and Irish setter; several smaller-breed dogs also appear to have increased likelihood of developing hypothyroidism, including the miniature schnauzer, cocker spaniel, poodle, and dachshund

Mean Age and Range

- Most common in middle-aged dogs (usually first diagnosed at 7 years of age)

Predominant Sex

- No predominant sex has been demonstrated to be at increased risk of developing hypothyroidism

SIGNS/OBSERVED CHANGES IN THE PET

- Clinical signs associated with hypothyroidism are vague and involve many different organ systems of the body
- Sluggishness (lethargy); weight gain; and hair loss (especially in areas of increased wear, such as the elbows) are the most common signs reported to the veterinarian by the owner; less common signs include skin infections (known as “pyoderma”) that often recur; darkened skin (known as “hyperpigmentation”); and dry brittle hair coat
- Rarely, facial paralysis
- Weakness

Dogs

- Most commonly noted signs include abnormalities of the skin, weight gain, sluggishness (lethargy), and weakness. Most changes appear to be secondary to decreased metabolism due to decreased levels of thyroid hormones. Skin changes are very common, but are not seen in every pet with hypothyroidism

Skin Abnormalities

- Dry, lackluster hair coat; hair becomes brittle and hair loss (known as "alopecia") is seen in areas of increased wear; usually includes the lower part of the chest and neck, lower part of the abdomen, and tail
- Symmetrical loss of hair on both sides of the trunk (known as "bilaterally symmetrical truncal alopecia"); the hair loss is non-itchy
- Loss of primary hair is most common, with guard hairs remaining, resulting in a short, fine hair coat, darkened skin (hyperpigmentation) and increased thickness of the skin are common, particularly in friction areas
- Excessive scaling of the skin (known as "seborrhea")—common; may be localized or have a more generalized distribution pattern
- Secondary bacterial infection of the skin (pyoderma) as well as parasitic (example, *Demodex*) infestation and yeast (example, *Malassezia*) infections are common; these secondary skin conditions may cause the skin to be itchy (known as "pruritus")
- Inflammation of the outer ear (known as "otitis externa") may be seen

General/Metabolic Abnormalities

- Sluggishness (lethargy)
- Weight gain

Abnormalities Involving the Nervous System

- Seizures; a wobbly, incoordinated or "drunken" appearing gait or movement (known as "ataxia"); and coma may be seen, but are rare

Abnormalities of the Heart

- Rarely, a slow heart rate (known as "bradycardia"); irregular heartbeats (known as "cardiac arrhythmias"); and poor heart function

Abnormalities of the Eyes

- Rare
- Cholesterol deposits in the cornea; the "cornea" is the clear outer layer of the front of the eye
- Dry eye (known as "keratoconjunctivitis sicca" or KCS)
- Inflammation of the moist tissues of the eye (known as "conjunctivitis")

Congenital (Present at Birth) Hypothyroidism

- Sluggishness (lethargy) and general inactivity
- Dwarfism
- Hair loss (alopecia)
- Constipation—more common in cats

CAUSES

- Inflammation of the thyroid gland characterized by the presence of lymphocytes (known as "lymphocytic thyroiditis"); lymphocytes are a type of white blood cell formed in lymphatic tissues of the body; lymphocytes are involved in the immune process
- Wasting away or decrease in size of the cells in the thyroid for unknown cause (so-called "idiopathic thyroid atrophy")
- Cancer
- Disease of the pituitary gland; the "pituitary gland" is the master gland of the body—it is located at the base of the brain; it controls many other glands in the body
- Congenital (present at birth) thyroid disease
- Dietary iodine deficiency; iodine is necessary for production of thyroid hormone
- Secondary to surgery or radiation (known as a type of "iatrogenic hypothyroidism")

Treatment

HEALTH CARE

- Outpatient

Medications

- Synthetic thyroid hormone supplementation easily treats hypothyroidism
- Levothyroxine is a thyroid (T4) replacement hormone; also known as “L-thyroxine
- Adjust dosage on the basis of serum thyroid hormone (T4) concentration from blood tests obtained after giving the thyroid hormone replacement medication and monitoring clinical response to therapy

Follow-Up Care

PATIENT MONITORING

- Check serum thyroid hormone (T4) levels after 6 weeks of therapy
- Serum thyroid hormone (T4) concentrations should be monitored and timed so that a blood sample is obtained **4-6 hours after administering the medication** for pets receiving thyroid hormone supplementation twice a day; a blood sample should be obtained immediately prior to administration of the medication and 6 hours after administering the medication for those pets receiving thyroid hormone supplementation once a day
- **Thyroid function should be monitored every 6–8 weeks for the first 6–8 months of thyroid hormone supplementation and then once to twice a year**

PREVENTIONS AND AVOIDANCE

- Adequate thyroid hormone supplementation with routine monitoring should avoid recurrence of this condition

POSSIBLE COMPLICATIONS

- If untreated, hypothyroid pets are at increased risk of developing myxedema (condition characterized by accumulation of mucopolysaccharides in the skin that lead to non-pitting edema; gives the face the classic “tragic” expression associated with hypothyroidism); myxedema coma; and atherosclerosis (condition in which fatty deposits, usually cholesterol, accumulate in the lining of arteries)
- Oversupplementation of thyroid hormone can result in medication-induced hyperthyroidism (known as “iatrogenic hyperthyroidism”)

EXPECTED COURSE AND PROGNOSIS

- Primary hypothyroidism can be controlled easily and successfully; the prognosis for pets is excellent, when treated appropriately
- Life expectancy should be normal
- Secondary and congenital (present at birth) forms of hypothyroidism have a guarded-to-poor prognosis

Key Points

- Treatment is lifelong
- Hypothyroidism is managed easily with thyroid hormone supplementation; the medication is administered by mouth (known as “oral thyroid hormone supplementation”)
- Dose adjustments are common in the early stages of treatment as the pet's response to oral thyroid hormone supplementation is evaluated
- Most clinical signs will resolve over time with appropriate thyroid hormone supplementation
- Adequate thyroid hormone supplementation with routine monitoring should avoid recurrence of this condition

Notes

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