VETERINARY TODAY

Popular Article
ISSN: 2583-8288

Hypothyroidism in Dogs

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Definition: It is a deficiency of thyroxine (T4) and 3,5,3 – triiodothyronine. In hypothyroidism, impaired production and secretion of the thyroid hormones result in a decreased metabolic rate.

It one of the most common yet challenging endocrine disease recognized in small animal species.

Epidemiology

Species: it is more common in cats as compared to dogs. The incidence rate in dogs is about 1:150 to 1: 500.

Breed predisposition: it is more common in mid to large sized pure breed dogs like boxer, Doberman, greatdane, daschund, golden retriever.

Age: higher incidence in middle aged (4-6 years) dogs.

Sex: females are more affected than males. Spayed females and castrated males are at more risk

ETIOLOGY: Structural and functional abnormality of the thyroid gland. Dysfunction anywhere in the hypothalamic pituatory thyroid axis may result in thyroid hormone deficiency. More than 95% of clinical cases results from destruction of the thyroid gland itself.

Primary hypothyroidism:

It is due to progressive destruction of thyroid gland It is more common (95% cases)
It occurs in 4 forms viz.

- Lymphocytic thyroiditis: it is regarded as an immune mediated disorder
- Idiopathic follicular atrophy
- Neoplastic destruction
- Iatrogenic

Secondary hypothyroidism:

It occurs due to deficient secretion of TSH (thyroid stimulating hormone) from pituatory gland. Follicular atrophy in the thyroid gland develops due to lack of TSH.

It is rare

Tertiary hypothyroidism

It is due to deficiency of hypothalamic thyrotropin releasing hormone (TRH) It is also rare and not reported in dogs.

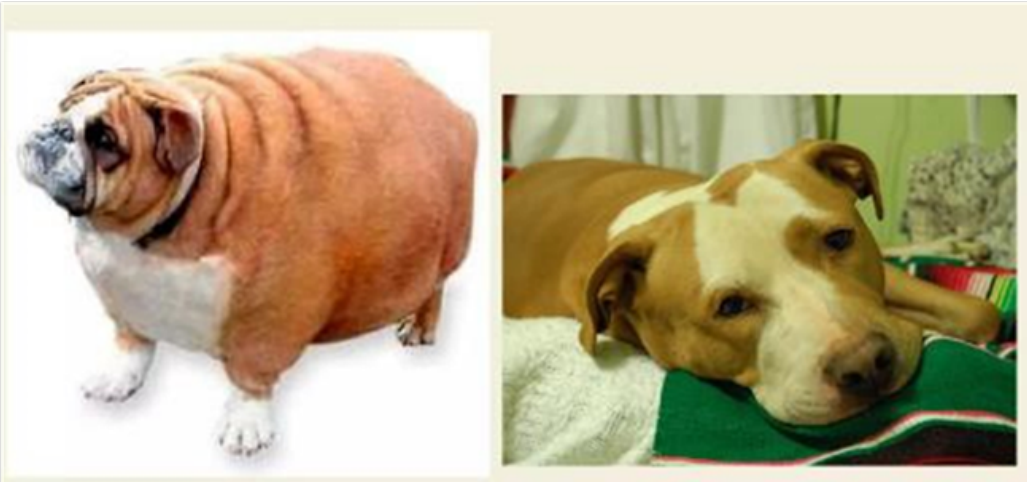
Congenital hypothyroidism:

Uncommon in dogs
Result from thyroid dysgenesis or from dyshormonogenesis.

CLINICAL SIGNS

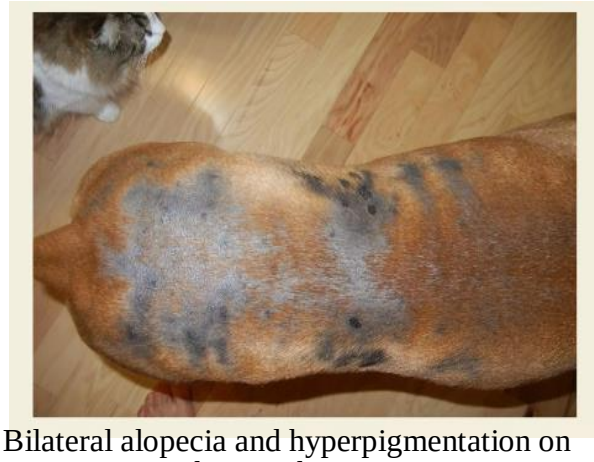
Gradual onset

Metabolic signs: exercise intolerance, cold extremities, weight gain, lethargy and mental dullness.



Weight gain and lethargic

Dermatological signs (most common): bilateral symmetrical alopecia commonly over trunk of the body, alopecia start at the tip of tail and ear, dry skin and hair coat, hyperpigmentation, hyperkeratosis, myxoedema with tragic facial expression.



Bilateral alopecia and hyperpigmentation on the trunck region

Cardiovascular signs: bradycardia, cardiac arrhythmias and weak pulse
Neuro muscular signs: weakness, facial nerve paralysis and head tilting ataxia.
Neuro ocular signs: strabismus, head tilting ataxia, partial or total blindness
GI Signs: constipation and diarrhea
Reproductive signs: infertility, prolonged anestrus and decreased libido.

Cretinism: hypothyroidism in puppies is termed cretinism

Retarded growth and impaired mental development are the hallmarks of cretinism.

Disproportionate body size, large broad heads, short limbs and delayed skeletal maturation due to epiphyseal dysgenesis.

DIAGNOSIS

Clinical signs: exercise intolerance, weight gain, bilateral alopecia over body and bradycardia.
Hematology: normocytic normochromic anemia

Serum biochemistry: cholesterol >400 mg/dl (normal 106-368 mg /dl), Hypoglycemia and Low levels of protein bound iodine (normal: 1.5-5 mg/dl).

Ultrasonographic findings
Hormonal assay: low levels of serum T3 and T4 (normal –T3; 45-149μg/dl , T4 1-4 ng/dl)
Thyroid gland biopsy: atrophy of follicular cells
Semen analysis: aspermia oligospermia and sperm abnormalities.

Rat tail appearance

TREATMENT:

Synthetic levothroxine is the treatment of choice for hypothyroidism. Liquid and tablet formulations are effective

The initial dosage of 0.02mg/kg with a maximum initial dose of 0.8 mg. Thyroxine sodium @ 20-40 μg/kg twice daily orally.

The initial frequency of administration is every 12 hrs unless the levothyroxine product has been specifically formulated for once daily administration. Adjust dose after 8 weeks of therapy.

Clinical recovery can be expected in 3-4 weeks however, total period may require 5-6 weeks in many cases treatment should be continued for life.