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## Hypothyroidism in dog: A case report

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**Abstract**

A male Labrador of 6 years with weight gain, lethargy, weakness, alopecia (rat tail, thin hair, truncal symmetrical), cold intolerance, neurologic signs was brought and a tentative diagnosis of hypothyroidism was done. The aim of the study was to diagnose the dogs with hypothyroidism. The blood of the dog was sent for haematological examination and T4 in the blood. The results revealed slightly lower value of T4 giving evidence of hypothyroidism. The owner was advised to bring the dog for regular visits and after 6 the visits improvement was noticed after treatment with Oral T4 (levothyroxine sodium) (0.022 mg per kg).

**Keywords:** Hypothyroidism, rat tail, anemia, oral T4 (levothyroxine sodium)

**Introduction**

Hypothyroidism is one of a very common endocrine disorder observed in canines <sup>[1]</sup> (Ramesh *et al.*, 2018). The most common occurrence is observed in mid to large sized pure-bred dogs between 4 to 8 years of age. Breeds that are most affected with hypothyroidism include Doberman, Golden Retriever, Irish Setter, Cocker Spaniel, Airdale Terrier, Miniature, Poodle, Borzoi Schnauzer, Dachshund, Pinscher, Beagle, Irish Setter Boxer, and Old English Sheepdog <sup>[2]</sup> (Scott-Moncrieff, 2007). Hypothyroidism can either be acquired or congenital (rare). Acquired hypothyroidism exist in two forms: primary and central <sup>[3]</sup>. Progressive destruction of thyroid glands leads to primary hypothyroidism mostly due to lymphocytic thyroiditis, an autoimmune mediated atrophy <sup>[4,5]</sup>. Some studies have reported that neutering in both sexes was associated with increased risk of hypothyroidism <sup>[6]</sup> although in smaller studies no relationship between neuter status and hypothyroidism was recorded <sup>[4]</sup>. In dogs and humans, almost all naturally occurring hypothyroidism is attributable to irreversible destruction of the thyroid gland. Histologically, primary hypothyroidism in humans and dogs presents as either lymphocytic thyroiditis or idiopathic thyroid degeneration (idiopathic follicular atrophy) <sup>[5]</sup>.

**History:**

A male labrador dog of 6 years of age was brought that was obese. It showed weight gain, lethargy, weakness, alopecia (Fig:1) (rat tail, thin hair, truncal symmetrical), cold intolerance, neurologic signs including facial paralysis, and stridor from laryngeal paralysis.



**Fig 1:** Arrow showing alopecia on tail.

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**Blood Examination**

Microcytic hypochromic anemia was reported in the blood examination. All other parameters were normal.

**Table 1:** Haematological examination of dog

Parameter	Normal value	Findings
Haemoglobin (g/dl)	12-18	Normal (13.5)
TLC (thou/mm <sup>3</sup> )	6-17	Normal (12)
DLC – Neutrophils (%)	60-76	Normal (63)
DLC – Lymphocytes (%)	12-30	Normal (29)
DLC – Eosinophils (%)	2-10	Normal (4)
DLC – Monocyte (%)	3-10	Normal (4)
DLC – Basophils (%)	0-1	Normal (0)
RBC (mill/mm <sup>3</sup> )	5.5-8.5	Normal (8.17)
PCV (%)	37-55	Normal (40.3)
MCV (Fl)	60-77	Microcytic (49.4)
MCH (PG)	19.5-24.5	Hypochromic (16.5)
Platelet count (thou/mm <sup>3</sup> )	211-621	Normal (259)
RDW-CV	0.115-0.159	Normal (0.148)

**Normal parameter:** If T4 level is >4.0, the dog is classified under NOT hypothyroid and if it is between 1.0 to 4., it is suspected for hypothyroidism. If <1.0, it is very likely to be hypothyroid.

**Table 2:** Normal parameters of T4 level

T4 mcg/dl	TSH Microu/ml	Classification
>4.0	Immaterial	NOT hypothyroid
1.0 to 4.0	= or	Euthyroid (=Normal)
1.0 to 4.0	> 0.04	Susp Hypothyroid
<1.0	> 0.04	Hypothyroid very likely
<1.0	= or < 0.04	Sick Euthyroid syndrome likely

**Our findings**

The T4 value obtained was 1.33 mcg/dl and it lies between the range of 1.0 to 4.0 and it means that the dog is suspected to be hypothyroid.

**Table 3:** Clinical finding of T4 level

Parameter	Normal value	Finding
T4 mcg/dl	1-4	1.33

**Treatment and Discussion:**

Oral T4 (levothyroxine sodium) (0.022 mg per kg) was given to the dog till 6 visits (1<sup>st</sup> visit at day 1, 2<sup>nd</sup> visit at day 4, 3<sup>rd</sup> visit at day 7, 4<sup>th</sup> visit at day 12, 5<sup>th</sup> visit at day 15, 6<sup>th</sup> visit at day 17). The dog showed improvement after 6<sup>th</sup> visit. Levothyroxine sodium has been widely used in humans since many decades for treatment of hypothyroidism [7]. It also got approval for treating hypothyroidism in dogs after its successful use in humans. Response to the treatment is appreciating and successful. Levothyroxine sodium can be used in the long-term safety and effectiveness. Dogs that have been clinically suspected for hypothyroidism with a low T4 concentration are difficult to differentiate from dogs with non-thyroidal illness (NTI). Gender does not influence the occurrence of hypothyroidism, so it also has no effect on the results [8].

**Conclusion**

The aim of the study was to identify the effect of Oral T4 (levothyroxine sodium) on the dog affected with hypothyroidism. Levothyroxine sodium has been widely used in humans since many decades for treatment of hypothyroidism. So, also got approval for treating

hypothyroidism in dogs after its successful use in humans. Clinicians should consider measuring serum TSH concentration as part of routine thyroid monitoring in adult dogs, especially in those that have a palpable thyroid nodule (s) but do not show classical clinical features of hyperthyroidism. Dogs that have been clinically suspected for hypothyroidism with a low T4 concentration are difficult to differentiate from dogs with non-thyroidal illness (NTI).

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