

# CANINE SKIN PROBLEMS ASSOCIATED WITH HYPOTHYROIDISM

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Hypothyroidism is the clinical condition considered as one of the most common canine endocrine disorder. Thyroid hormone influence the metabolism of most of organs in the body. Deficiency of thyroid hormone results in a decreased metabolic rate, which may cause a wide variety of symptoms. In decreased metabolic rate the speed at which cells function or work slow down. The clinical signs of hypothyroidism are therefore variable and nonspecific (Ettinger and Feldman, 2000). Alopecia is a common clinical signs of hypothyroidism; 25% of hypothyroid dogs have been reported to present with symmetrical bilateral endocrine alopecia (Feldman and Nelson, 2004). Diagnosis of canine hypothyroidism can be challenging for two main reason; first, several other diseases can present with similar clinical sign and second, there is no ideal test to assess canine thyroid function.

## History and clinical examination

Five dogs of more than 5 yrs of age were referred to Teaching Veterinary Clinical Complex with the history of recurrent alopecia. History revealed that all the dogs were treated for the mange and for fungal infection from a long period of time. All the owners were frustrated with the management. The dogs were presented with a common complaint of lethargy, cold extremities and preference to seek the warmth.

Clinical examination revealed that the dogs were having bilateral seborrheic alopecia, hyper pigmentation reduced activity and obesity. Three of them showed the rat tail appearance with secondary pyoderma and seborrhea.

On the basis of the history and clinical examination a clinical diagnosis of hypothyroidism was made and T4 estimations were carried out of which the results were as below;

Sr. No.	Breed	Sex	Age (years)	T4 values (µg/dl)
1	German Shepherd	Male	6	1.70
2	German Shepherd	Male	5	1.76
3	German Shepherd	Female	8	1.70
4	Spitz	Female	11	1.65
5	Mongrel	Male	6	1.83
Average ± S. E.			7.20±1.07	1.73±0.03

A diagnosis of hypothyroidism was made on the basis of the reported values which were below the normal range i.e. 2.1 – 4.8 µg/dl as cited in the literature.

All the dogs were treated with Levothyroxine sodium i.e. Tab. Eltroxin with a recommended dose of 11-22 µg/kg starting with the lower dose and gradually increasing the dosage (Castillo, 2011).

After two weeks of initiation of treatment alopecia was found to be reduced and re-growth of hairs was noticed, activity level improved as well. In all the five patients 2 showed complete recovery within 6 weeks where as in three dogs it took 8 weeks for resolution of the lesion.

## Discussion

Hypothyroidism occurs commonly in dogs and is usually associated with thyroid atrophy or lymphocytic thyroiditis. In over 90% of dogs it is due to primary atrophy of the glands, either focal or more of the follicle (Benjamin *et al*, 1996). Lethargy, intolerance to cold and alopecia is observed in the present study can be attributed to low levels of Thyroxine (T4), because this hormone is concerned with metabolism of most cells and stimulate growth this is in general agreement with that of Panciera (1997). This induces DNA translation, which results in greater activity in cell synthesis, oxidative phosphorylation. Approximately 80% of the secreted thyroid hormone is T4 and 20% is T3. A failing thyroid gland preferentially makes T3, so in developing hypothyroidism, T4 is

expected to decrease earlier than T3. Serum T4, levels are considered more useful in the diagnosis of hypothyroidism than are triiodothyronine (T3) level (Nelson *et al.*, 1991). And therefore T4 estimation was thought to be supporting evidence for our clinical diagnosis. Average serum T4 in the present study was  $1.73 \pm 0.03$   $\mu\text{g/dl}$  which confirmed hypothyroidism and is in accordance with that of (Daminet and Paradis, 2000). An increase in physical activity was noticed within two weeks after initiation of treatment, but significant improvement in skin condition required more than four weeks treatment.

Although several breeds are listed as being predisposed (Scarlett, 1994), this may reflect a referral population bias. The German Shepherd has been shown to be one such predisposed breed.

Feldman and Nelson, (2004) reviewed that supporting evidence from routine laboratory tests would be a mild normocytic, normochromic anaemia and partially a fasting blood cholesterol level above 300 mg/100ml, which occurs in about two thirds of hypothyroid dogs. However, these findings may arise from causes other than those due to the peripheral action of thyroid hormone. Dogs may be affected from 2 years old onwards but most are presented in middle age (4-8 years old) occasionally older. In our study also 80% of the dogs confirmed to be hypothyroid were in middle age (5-8 years) and only 20% (11 years) was older. This is in agreement with that of (Benjamin *et al.*, 1996).

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