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Clinical management of hypothyroidism associated with recurrent pododermatitis in an obese male Beagle dog

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Abstract

A two year old male obese Beagle dog was presented with history of inflamed swelling of all four paws. Physical examination revealed marked obesity with tragic facial expression, hair fall, mental dullness, unwilling to exercise and excessive amount of fat covering the ribs, neck, spine, base of tail and hip. Also, the dog had a history of recurrent skin infection from last one year, which included painful inflamed paws, dry scaly skin, seborrhea, alopecia were present at base of tail, bilateral thigh region and ventral abdominal region. Hemogram depicted normocytic, normochromic anemia. Hormonal and biochemical parameters revealed lower levels of T_3 and T_4 . While as, increased level of serum cholesterol, serum triglycerides and TSH. On the basis of clinical observations and thyroid function test, the present case was confirmed as hypothyroidism associated with recurrent pododermatitis. The dog was treated with Levothyroxine along with quinolone antibiotics with complete recovery in 2 months after initiation of treatment without any recurrence.

Keywords: Hypothyroidism, recurrent pododermatitis, obesity, beagle, treatment

1. Introduction

Hypothyroidism is the result of decreased production of thyroxine (T₄) and triiodothyronine (T₃) by thyroid gland. Naturally occurring hypothyroidism is common in dogs but extremely rare in cats. Because thyroid hormones influence the function of many organs, hypothyroidism should be considered in the differential diagnosis of a wide range of problems. Clinical signs of hypothyroidism may be nonspecific and insidious in onset, commonly misdiagnosed ^[1]. The most common clinical signs of hypothyroidism are those related to a decrease in the metabolic rate and dermatologic changes. Obesity and dermatological changes occurs in approximately 40% and 60% to 80% of hypothyroid dogs, respectively ^[2]. Clinical signs attributable to decreased metabolic rate include lethargy, weakness, mental dullness, weight gain, unwillingness to exercise and cold intolerance ^[1]. Dermatological manifestations include dry scaly skin, changes in hair coat quality, hyperkeratosis, hyperpigmentation, alopecia, seborrhea and poor wound healing ^[3].

Pododermatitis describes any inflammatory skin disease that involves the paw. It is frequently painful and pruritic and the resultant self-trauma may predispose to secondary microbial infection ^[4]. A case of hypothyroidism in a male Beagle dog associated with recurrent pododermatitis and its successful clinical management is presented.

2. Case History

A two year old 32 kg body weight male Beagle dog was presented to Teaching Veterinary Clinical Complex, Khalsa College of Veterinary and Animal Sciences, Amritsar with the history of painful inflamed swelling, itching, pustular lesions with reddish brown staining on the dorsal aspect of all four paws as well as in interdigital spaces, since two weeks (Fig. 1). Detailed history of animal revealed recurrent skin infection from last one year, which included painful inflamed paws, dry scaly skin, seborrhea, alopecia were present at base of tail, bilateral thigh region and ventral abdominal region. The dog was treated previously with enrofloxacin, ketoconazole, ivermectin and antifungal shampoo for 15 days with marked recovery but relapse appeared again after cessation of treatment. The owner clarified that the dog gaining weight despite a small dietand had an effective deworming and vaccination history.

3. Clinical-Haemato-Biochemical and Hormonal Investigation

Detailed clinical examination of the dog revealed lesions were hyperemic and crusted (at few places), from which the blood and purulent exudates were oozing out (Fig. 1). Physical examination showed marked obesity with tragic facial expression (Fig. 2), hair fall, mental dullness, unwilling to exercise and excessive amount of fat covering the ribs, neck, spine, base of tail and hip (Fig. 3).The dog weighed 32 kg and the body condition score (BCS) was computed as 9.0 on a nine point scale based on body conditions and symptoms according to Laflamme *et al.* ^[5] Hyperkeratosis and hyperpigmentation of both elbow joints was evident (Fig. 1). However, the clinical parameters such as rectal temperature, heart rate and respiration rate were within the normal physiological limits.

Hemogram depicted normocytic, normochromic anemia with mild neutrophilia (Hb- 9.2 g/dl, TEC- 4.8 ×10⁶/µl, TLC- 10.2 $\times 10^{3}$ /µl, N- 82/µl, L-14/µl, E- 4/µl) and adequate platelets. Blood smear examination for haemoprotozoa was negative. Values for plasma glucose, serum cholesterol, serum triglycerides and high density lipoprotein were recorded as 85 mg/dl, 298 mg/dl, 136 mg/ dl and 43 mg/dl, respectively falling within normal range except for serum cholesterol and triglyceride that was slightly on the higher side. Aseptically, pus was collected from the lesions for anti-biogram aspects, whereas, deep skin scrapings were also collected using blunt scalpel blade to rule out mite infestation. Anti-biogram from lesions showed resistance towards penicillin, tetracyclines and sensitive towards quinolones. The skin scraping showed negative results. On the basis of clinical observations, the case was tentatively diagnosed as hypothyroidism. For further confirmation, the dog was subjected to thyroid function test (T₃, T₄ and TSH estimations), which showed decreased levels of Triiodothyronine (T₃) 21 ng/dl, Thyroxine (T₄) 0.5µg/dl elevated TSH secretion 7.8µIU/ml indicating and hypothyroidism.

4. Diagnosis

On the basis of clinical observations and thyroid function test, the present case was confirmed as hypothyroidism with recurrent dermatological affections.

5. Treatment and Discussion

The animal was prescribed L-thyroxine (Eltroxin) @0.02 mg/kg BID orally for first month and then from second month once a day with a feeding of formulated diet (Obesity DP-34-Royal Canin, @25 g/kg/day). Tab Enrofloxacin @5 mg/kg

and tab Cetrizine @10 mg BID orally for 15 days was also prescribed along with local dressing of lesions with povidoneiodine ointment. After 15 days the animal showed marked recovery with dryness in the lesions, reduction in pain and blood mixed purulent discharges (Fig. 4). Animal became active, start losing body weight (Fig. 3) and level of Hb, T₃, T₄ and TSH started to normalize. Owner was advised to continue antibiotic treatment for next week also. After two months owner informed that the dog has completely recovered without any recurrence and thriving well (Fig. 5).

A variety of different medical conditions can result in a dog developing pododermatitis. Various hypotheses have been proposed to explain the pathogenesis of idiopathic pododermatitis including pedal conformation, food allergy, trauma, immunosuppression, bacterial infection, furunculosis and stress ^[4]. The clinical history is often characterized by periods of disease exacerbation and remission, although some dogs have lesions that persist andinvolve all four feet ^[6]. Skin scrapings and microbial cultures taken from the affected lesions are required to make differential diagnosis such as pyoderma and demodecosis ^[7].

Hypothyroid dogs are predisposed to recurrent bacterial infections of the skin and poor wound healing capacity ^[2].Myxedema, hyperpigmentation, weight gain, lethargy, mental dullness, exercise intolerance and normocytic normochromic anemia occurred due to decrease T₄ level ^[3]. Similar clinicopathological findings were observed in present study also. Myxedema is a rare dermatological manifestation of hypothyroidism characterized by non-pitting thicking of the skin, especially of the eyelid, cheeks and forehead leading to a "tragic" facial expression [1]. Heavy look with fat deposition on neck leading to skin fold, unpalpable ribs, heavy weight, absence of waist and abdominal tuck making body condition score as 9 were in accordance with the symptoms described for obesity in dogs [8]. Heavy look of the dog despite less than normal eating was suggestive of static state of obesity ^[9]. Normal glucose level (85 mg/dl) clearly ruled out the association of obesity of the dog with diabetes mellitus. However, drastically low values of T₃, T₄ and elevated TSH level clearly indicated hypothyroidism.

Muller and Kirk ^[10] discussed about oral medication of Levothyroxine as a most effective drug of choice for the treatment of hypothyroidism in dogs. Effective treatment of pododermatitis in animal with quinolone antibiotics has been reported by Lathamani *et al.* ^[11], Nair *et al.* ^[12]. Animal was recovered clinically after 2 months of treatment, which was correlated with the findings of Muley *et al.* ^[13], Tresamol *et al.* ^[14].



Fig 1: Pododermatitis lesions with reddish brown fluid

Fig 2: Dog with "tragic facial expression"



Fig 3: Excessive amount of fat covering the ribs, neck, spine, base of tail treatment and hip



Fig 5: Recovered animal after treatment

6. Conclusion

Hence, it may be concluded that the daily oral dosing of Lthyroxine @0.02 mg/kg BID for first month and OD from second month along with enrofloxacin @5 mg/kg orally BID for 15 days has a promising efficacy against hypothyroidism associated with recurrent pododermatitisin a dog.

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Fig 4: Dog showing marked recovery during

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