

Findings on the pathological aspects of chronic Pododemodicosis in dogs

Abstract

Canine demodicosis is one of the most common external parasitic diseases encountered in veterinary practice. Three adult dogs were identified suffering with pododemodicosis which were presented to the clinic with history of pododermatitis for more than two months duration. Clinical examination of the dogs revealed dry, crusty lesions over the paws and at inter digital space, rough hair coat and scaly patches. Skin scrapings and hair plucks were collected from the lesions and microscopic examination revealed presence of *Demodex canis* organisms and abnormalities of the hair follicles. Dogs had reduced hemoglobin concentration, packed cell volume and total erythrocyte count; increased in total leucocyte count and eosinophil count. Serum analysis revealed elevated total serum protein levels and reduced serum albumin and increased serum globulin levels. Dogs were advised with oral ivermectin @ 400µg/kg body weight daily, bathing with shampoo containing benzyl peroxide weekly twice and daily supplementation of boiled egg white and syrup containing salmon oil for 4weeks. Clinical improvement was noticed after 4weeks of therapy and success of the therapy was assessed based on the reexamination of skin scrapings after initiation of therapy.

Keywords: dogs, pododemodicosis, diagnosis, globulin

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Introduction

Demodicosis is one of the inflammatory parasitic skin diseases which is characterized by excessive proliferation of demodectic mites in the skin. *Demodex canis*, *D. injai* and *D. cornei* are considered as the etiology for demodicosis in dogs.¹ These parasites are part of the normal skin flora in dogs and clinical disease occurs when dogs with immunocompromised conditions.² Two forms of demodicosis are common in dogs i.e., generalized and localized. Apart from the generalized form, parasites may present at inter digital space resulting in to pododermatitis.³ In most of the dogs, pododemodicosis was self-resolving but in few dogs, it will be chronic in nature. The present communication reports the pododemodicosis in dogs.

Materials and methods

Three adult dogs (2 to 4years age old) were presented to the clinic with history of pododermatitis for more than 2months inspite of therapy. Dogs had been treated with different combinations of drugs (external application of an ointment containing an antibiotic, antifungal and steroid; oral antibiotics; and occasional parenteral ivermectin, at other hospitals, with which there was partial recovery, and symptoms recurred every time after the therapy had been stopped for 2-3weeks. Clinical examination of the dogs revealed dry, crusty lesions over the paws and at inter digital space, rough hair coat and scaly patches. Deep skin scrapings were collected till the capillary bleeding and hair plucks were also collected from the lesions and examined under microscope.^{4,5} Whole blood was collected in EDTA(Ethylenediaminetetraacetic acid) coated vials and processed for packed cell volume by microhematocrit method, hemoglobin by Sahli's method, total leucocyte count and total erythrocyte count by dilution method. The blood smears were directly prepared and stained by Leishman's stain for differential count.⁶ Serum was collected for estimation of serum total protein and albumin levels as per the Kit method.

Results and discussion

Microscopic examination of the skin scrapings and hair plucks revealed ova as well as different stages of live *Demodex* mites. Simultaneously, examination of new methylene blue stained acetate tape impression and glass slide impression smears from various sites also revealed mites besides the only neutrophils which suggestive of pododemodicosis. Hair pluck examination revealed the abnormalities at the follicles of the hair. Dogs had reduced haemoglobin concentration (9.1 to 10.08g/dL), packed cell volume (27 to 31%), total erythrocyte count (4.45×10^6 /cumm to 5.08×10^6 /cumm). The decrease in the values of hemoglobin and TEC might be due to anaemia caused by the loss of skin protein and stress arising from the disease. Increased in total leucocyte count (12,850 to 16,122) and eosinophil count (8% to 12%) was noticed. Leukocytosis might be due to allergic reaction caused by mite or their products of inflammatory reaction. Serum analysis revealed elevated total protein levels (from 6.84 to 7.31g/dL) and reduced serum albumin levels (from 1.68 to 1.89g/dL) and increased serum globulin levels (from 5.16 to 5.42g/dL). Dogs were advised with oral ivermectin @ 400µg/kg body weight daily once, bathing with shampoo containing benzyl peroxide weekly twice and daily supplementation of boiled egg white and syrup containing salmon oil. Clinical improvement was noticed after 4weeks of therapy and success of the therapy was based on the reexamination of skin scrapings after initiation of therapy.⁷ Successful treatment of this condition is dependent on finding and identifying the mite population in skin scrapings or impression smears and instituting appropriate and effective treatment protocols. In the present study, salmon oil was given to nourish the skin and hair follicles because essential fatty acids are important in the maintenance of epidermal barrier function, as components of cell membranes and as precursors of prostaglandins, leukotrienes, thromboxenes and other substances involved in mediating inflammation. Benzyl peroxide-based shampoo are often recommended because of their keratolytic and supposed follicular flushing activity (Figures 1–6).



Figure 1 Thickened skin and presence of erythematous lesions over the paw region.

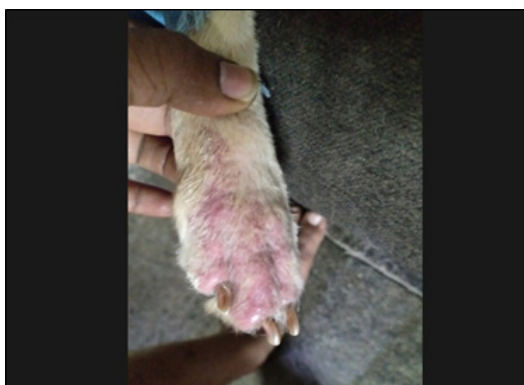


Figure 2 Scaly lesions and erythematous patches of skin over the paw region and nail bed infection.



Figure 3 Lesions at the inter digital space and patches of alopecia and erythema.

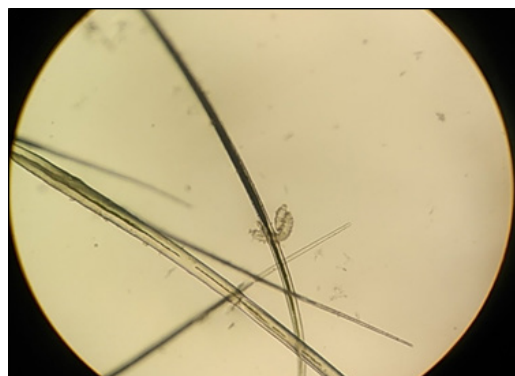


Figure 4 Microscopic image of *Demodex canis* mites (100x) in deep skin scraping.



Figure 5 Hair follicle abnormalities with fragments of mites.

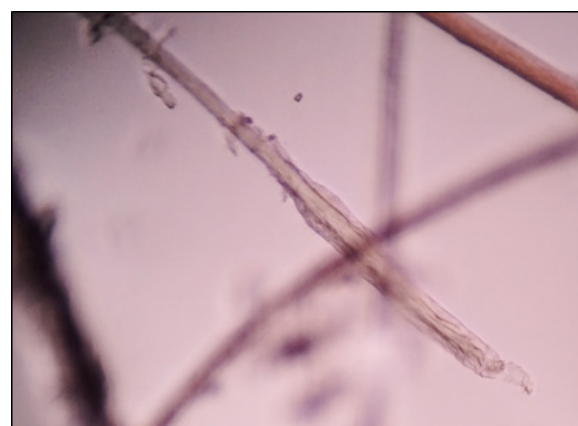


Figure 6 Telogen hair bulb in dogs with Pododemodicosis.

Conclusion

Present study reports the changes in hair follicle and serum albumin levels in chronic pododemodicosis in dogs.

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None.

Conflicts of interests

The authors declare that there are no conflicts of interest.

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