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Allergic dermatitis in a German Shephard dog in association with Toxocara canis infection

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Abstract

A six-month-old German Shephard was brought to the clinic with recurrent skin lesions, pruritus for a period of two months. Upon clinical examination, erythematous patches and crusty lesions were noticed on the ventral abdomen. Microscopic examination of stained tape impression smears showed the presence of neutrophils, eosinophils and cocci. Unembryonated eggs of Toxocara canis were found on faecal sedimentation technique. Elevated levels of serum alkaline phosphate and alanine aminotransferase was noticed. Dog was treated with oral cyclosporine, omega-3 and omega-6 fatty acids, pyrantel pamoate, hepato-protective syrup and external application of fluticasone propionate with mupirocin ointment. Following 21 days of treatment, noticeable clinical improvement was noticed until nine months of post therapy. Allergic dermatitis due to toxocariosis in a dog is reported in this article.

Keywords: *Toxocara canis,* Dog, Dermatitis, Pyrantel pamoate, Cyclosporine

Toxocariosis caused by the *Toxocara canis* is a zoonotic intestinal parasite of dogs. Dogs can become infected through transmammary, transplacental, by eating food contaminated with *Toxocara canis* ova, ingestion of paratenic hosts and less commonly by cutaneous route (Nijsse *et al.,* 2016). In dogs, it may result in subclinical or clinical infections that worsen up to mortality. The adult worm load and the host's immune condition determine the clinical manifestation of toxocariosis. Allergic dermatitis due to *Toxocara canis* infection has been rarely documented.

A six month old German Shephard was brought to the clinic with a history of recurrent skin lesions, pruritus for the period of two months which had responded well to the therapy and recurrence noticed after completion of therapy. Clinical examination revealed erythematous patches and crusty lesions in the inner thigh and ventral abdomen. Microscopic examination of methylene blue stained tape impression smears showed the presence of neutrophils, eosinophils and cocci. Unembryonated eggs of *Toxocara* spp. were discovered upon sedimentation faecal smear analysis. Haemato-biochemical evaluation showed haemoglobin 11.5 g/dL, packed cell volume 34.5%, total erythrocyte count 5.64 million/cumm, total leucocyte count 14660 cells/cumm, percentage of neutrophils 70%, percentage of lymphocytes 18%, percentage of monocytes 2%, percentage of eosinophils 10%, serum albumin 1.77 g/dL, alkaline phosphate 128 IU/L, alanine aminotransferase 212 IU/L. The clinical condition was determined to be toxocariasis in association with the allergic dermatitis. The dog was treated with oral cyclosporine (with initial dose of 5 mg/kg body weight twice daily followed by gradual tapering for a period of 14 days), syrup containing omega 3 and 6 fatty acids (@ 5 ml twice daily orally for one month), three doses of suspension pyrantel pamoate (@ 10 mg/kg body weight), syrup containing the hepato-protective supplement (@ 5 ml twice daily orally for a month) and external application of ointment containing the fluticasone propionate (0.005%) and mupirocin (2.0%) until resolution of skin lesions. The dog showed marked recovery after 10 days of therapy and complete clinical recovery was noticed by 21 days of therapy. There was no recurrence was noticed until nine months of post therapy (Fig. 1A, 1B,1C and1D).

Present case report about the possible role of *Toxocara canis* in inducing chronic allergic dermatitis. The causative role of *Toxocara canis* in development of dermatitis is being supported by eosinophilia and elevated hepatic enzymes in the present study. Pinelli and Aranzamendi (2012) reported that dermatological lesions consist of sensitization phase with allergic reaction activated by the innate immunity and further induces the inflammation, recruitment of leukocytes and further activation of resident and dendritic cells. Gavignet *et al.* (2008) reported that CD8+

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cells produced cytokines and caused the keratinocyte apoptosis, CD4+ T cells down regulated the allergic dermatitis by controlling the expansion of CD8+ T cells in the lymphoid organs and their activation in the skin. *Toxocara canis* infected dogs exhibited higher levels of IgG and IgE levels and noticed the development of skin lesion scores and pruritus (Fischer *et al.,* 2018). Further research studies are warranted to record the role of *Toxocara canis* infection in associate with the dermatological lesions in dogs.

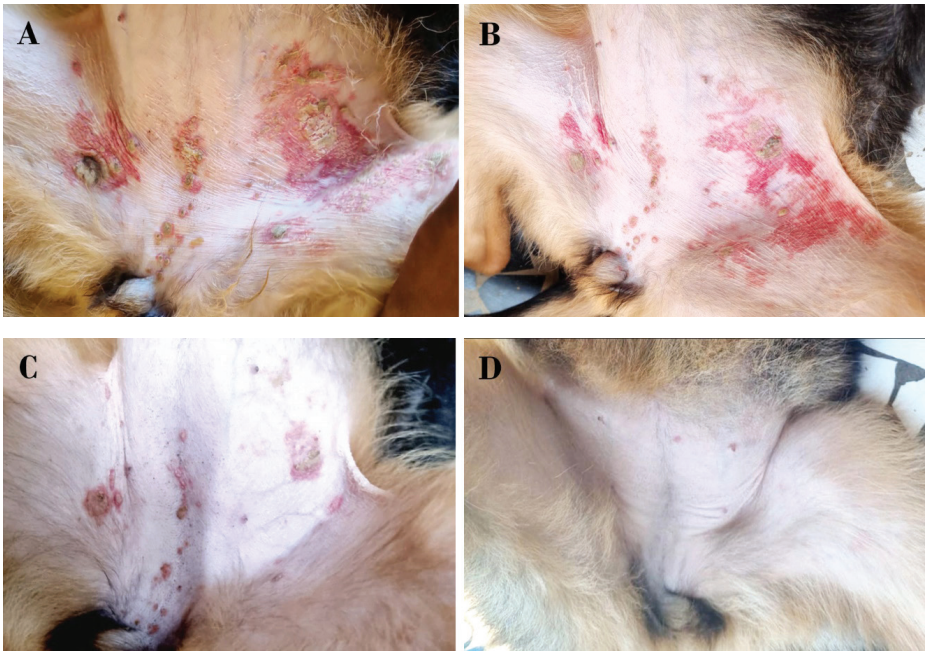

Fig. 1: Clinical response to the therapy (0^{th}; 3^{rd}; 10^{th}; 21^{st} day of post therapy)

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