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Successful treatment of canine generalized demodicosis in dogs using afoxolaner

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Abstract

A two years old male non-descriptive dog weighing approximately 15 kg presented to Veterinary Clinical Complex, Nagpur with a history of severe pruritus, periorbital alopecic patches, with lesions on the trunk, muzzle, and legs, without any change in other activities. Deep skin scrapings were taken for microscopic examination which revealed 50-60 Demodex mites per field. The present study describes the successful treatment of canine generalized demodicosis in a non-descriptive dog using long-acting systemic insecticide and acaricide, Afoxolaner which belongs to the isoxazoline group.

Keywords: Afoxolaner, demodicosis, canine, *Demodex canis*

Introduction

The most typical parasitic disease that affects dogs is canine demodicosis. It is brought on by an overabundance of *Demodex canis*, *Demodex injai*, and *Demodex cornei*, which are normal skin-dwellers of dogs that colonize the hair follicles and sebaceous glands. The most frequent mite detected on a dog's skin is *Demodex canis* (Muller *et al.*, 2020) [10]. Based on the size of the lesions present on the body; Demodicosis is divided into two primary types: localised demodicosis and generalised demodicosis. The lesions affecting the face, muzzle, and forelimbs have a diameter of less than 2.5 cm categorized under localized demodicosis (Djuric *et al.*, 2019) [11], However, more than five lesions covering the entire body and having a diameter of more than 2.5 cm are indicative of generalized demodicosis (Fourie *et al.*, 2015) [9]. Alopecia, pustules, erythema, crusts, follicular hyperkeratosis, and seborrhoea are the most common dermatological abnormalities that can be present in dogs with canine demodicosis. (Scott *et al.* 2001) [12]. Canine generalized demodicosis may be found in two forms; Squamous form which is the less severe initial form characterized by distension of hair follicles, erythema, hyperkeratosis, and hyperpigmentation whereas the Pustular form is the more severe phase where bacteria invade the skin which results in formation of pustules.

Generalized demodicosis, one of the most severe skin disorders that can affect dogs, is difficult to cure. Canine demodicosis is a complex infection that is thought to have a number of immunologic and genetic components that are essential to its pathogenesis. A condition known as oxidative stress occurs when the creation of free radicals outpaces the antioxidant system's capacity to neutralize them, leading to tissue damage and potentially disrupting molecular structures. Numerous allergic and inflammatory cutaneous illnesses, allergies, etc. are thought to be influenced by oxidative stress. It has been established that oxidative stress and demodicosis are connected.

Materials and Methods

The Demodex mites are typically identified by various methods *viz.* skin scrapings, analysis of plucked hair, skin biopsy, direct observation of exudate from pustules, adhesive tape method, etc. However, in the present study, the deep skin scraping method was carried out which is the most reliable method used to diagnose the demodex mites.

A scalpel blade was used to collect the scrapings, before scraping the site was rubbed with the cotton which was soaked in liquid paraffin. The scrapings were collected until a small amount of dermal blood began to ooze from the capillaries. A few drops of oil held the material in suspension. A coverslip was placed on a microscopic slide with paraffin, and low and high-power examinations of the preparation were performed. Thereafter, the slide was examined under 10X and 40X magnification.

Case History and Observations

A two-year-old male nondescript dog weighing about 15 kg arrived at the Veterinary Clinical Complex, Nagpur Veterinary College, Nagpur. The dog had a history of acute pruritus, alopecic patches, and papules all over his body, including his legs and nose, muzzle and body, as well as no change in his appetite. The dog received the recent deworming and immunization and the dog otherwise had no other health-related issues.

Clinical signs

Prominent lesions were present on the face, muzzle, around eyes, on trunk, tail and limbs without any change in the appetite. Alopecic patches all over the body, along with erythema and papules. Deep skin scrapings were collected from various lesions. The numerous Demodex mites were

discovered through microscopic analysis. The case is identified as Generalized Demodicosis based on examination of the lesions, microscopic findings, and the history of the dog.

Therapeutic Management

The dog was treated with Ivermectin, Doramectin and several other drugs before presenting at the Veterinary clinical complex, but there was no significant change. According to the owner, the relapse of the condition occurred many times. So instead of using conventional drugs, we have decided to use the new drug Afoxolaner. Afoxolaner chewable tablets are given to the dog at a dose rate of 2.5 mg/kg B wt. once a month for three months, along with antihistamine tablets like Hydroxyzine Hydrochloride, and Cephalexin tablets to prevent secondary bacterial infections.



Fig 1: Images representing the progressive improvement in the dog after treatment with afoxolaner for 3 months

Conclusion

Generalized demodicosis is an extremely time-consuming illness to treat, and if left untreated, it can be fatal due to the development of secondary bacterial infections. Demodex

mites mainly feed on the exudates of the sebaceous glands and follicular glands. Under normal conditions these mites don't cause any skin infections, immunosuppression is the main cause for the proliferation of these mites and causes the

demodicosis in dogs. The clinical signs and lesions may be due to various predisposing factors like malnutrition, abnormal environment and poor condition. Amitraz, Ivermectin, Doramectin, and Moxidectin, among other frequently used therapeutic choices, must be administered repeatedly to the patient to be effective, and certain side effects are also noted. Afoxolaner is a systemic insecticide with a long half-life that belongs to the isoxazoline class of ectoparasitoids and acts as a GABA receptor antagonist by inhibiting the movement of chloride ions in and out of nerve cells. As a result, the nervous system experiences unregulated activity causing paralysis and death of ticks, mites and fleas. Afoxolaner chewable tablets can be used in dogs above 2 months of age and over 2 kg weight. Afoxolaner chewable tablet administration is a highly simple and time-saving approach to treating generalized demodicosis without any negative side effects, and it has the advantage of lowering the likelihood of treatment failure because of owner carelessness throughout the treatment process. After receiving treatment for a few months, the body lesions reduced and hair growth began. The skin scrapings were collected every and after 3 months microscopic inspection revealed no evidence of mites.

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