

Study of Therapeutic Management of Canine Demodecosis

Kavita Jaidiya^{1*}, Durga Bai Sodha², Sulochana Dariya³ and Chitra Jaidiya⁴

¹Department of Veterinary Medicine, College of Veterinary and Animal Science, Bikaner (Rajasthan), India.

²Department of Veterinary Parasitology, College of Veterinary and Animal Science, Bikaner (Rajasthan), India.

³Department of Veterinary Pathology, College –PGIVER, Jaipur (Rajasthan), India.

⁴Department Veterinary Public Health and Epidemiology,
College of Veterinary and Animal Science, Bikaner (Rajasthan), India.

(Corresponding author: Kavita Jaidiya*)

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ABSTRACT: Canine demodecosis is a prevalent skin disorder. A total of 24 canines presented to VCC with a history of itching, baldness, hyper pigmentation, and crust formation at specific locations on the body. Following a general evaluation, the physiological parameters were confirmed to be within normal limits. A total of 24 skin scrapings were obtained to detect mites. Deep skin scrapings were taken using a blunt scarpel thoroughly disinfected in 70% alcohol or over a gas flame. A drop of liquid paraffin was applied to the center of the glass slide. The scarpel's edge was dipped in liquid paraffin before being collected. A fold of skin was pinched with the lesion between the thumb and forefinger, and the crust of the fold was scraped thoroughly with a blade or blunt scalpel until blood poured out. The acquired skin scraping samples were placed in a 15 ml glass centrifuge tube, and 5 ml of 10% potassium hydroxide (KOH) solution was added. The substance was then gradually repaired until the particles had dissolved appropriately. The material was then centrifuged at 3000 revolutions per minute for 5 minutes. A pipette was used to drain the supernatant fluid and put 1-2 drops of sediment to a thin glass slide. The cover slip was then placed on the slide and checked for mites using a microscope with a low power lens. The treatment began with a tablet of Neomec (Ivermectin) 400mcg/kg body weight once daily orally until two consecutive negative results for *Demodex canis* were obtained, followed by a tablet of Avil (25 mg) once every five days. During this time, the patient was advised to take a wash with Ketochlor shampoo followed by a bath with Ridd solution (3 ml in one litre of water). Syrup Nutriccoat was also administered orally. After three months of treatment, the dogs recovered without incident, with all lesions completely healed.

Key words: Demodecosis, Folliculities, Ridd.

INTRODUCTION

The skin is the body's biggest organ, performing a variety of activities including as thermoregulation, immunological defense, sensory perception, vitamin D generation, and acting as a barrier between the animal and its environment. Aside from these critical activities and disorders that directly impact the skin, it may also share or reflect pathological processes from other tissues. Because of these features, dermatologic issues are among the most prevalent conditions seen in veterinary facilities. The veterinarian must grasp the physiology of the most frequent dermatologic problems affecting dogs and cats, as well as their treatment.

Demodecosis is a non-communicable parasitic condition characterized by excessive production of host-specific follicular mites from several demodex species. Demodicosis is a highly common skin condition in dogs, but rare in cats. There are three types of demodex mites that live in dogs. *Demodex canis* is the clinical cause of the vast majority of canine demodecosis cases (Singh *et al.*, 2011). Other species, such as *Demodex injai* (a large-bodied mite) and Jaidiya *et al.*,

Demodex cornei (a short-bodied mite), may potentially be implicated (Tater and Patterson 2008; Niquee Kumara *et al.*, 2018).

D. Injai infection is typically linked with dorsal seborrhoea dermatitis (Bensignor *et al.*, 2006). *Demodex cornei* is the provisional name given to a newly detected short-bodied Demodex species mite. Unlike the other canine *Demodex* species mites, D. Cornei may reproduce in the epidermis's most superficial layer. It is 50% shorter than the other type of *D. canis* (Tamura *et al.*, 2001).

It is also known as demodectic Mange. Canine demodecosis develops when a significant number of *Demodex canis* mites colonize hair follicles and sebaceous glands. In tiny numbers, these mites are part of the natural flora of canine skin and rarely produce clinical symptoms (Gortel, 2006).

Mites migrate from the dam to the puppies within the first 72 hours after birth (Horne, 2010). The mites live their whole life cycle on the host, and disease is not thought to be communicable. The pathophysiology of demodecosis is complicated and poorly understood;

However, there is substantial evidence of a familial tendency to the disease. Immunosuppression, whether natural or iatrogenic, can sometimes cause an infection. Secondary bacterial deep folliculitis, furunculosis, or cellulitis may develop, with a guarded prognosis (Shimala *et al.*, 2018). It has been demonstrated that demodex invasion in dogs causes a wide range of clinical symptoms, from single skin lesions to systemic disease affecting internal organs (Parwari *et al.*, 2022; Prosyanyi & Horiuk 2023). Demodex may first present as a little patch of hair loss, probably caused by scratching the region (Head and Face), redness or inflammation of the skin with crusting. Demodex has three distinct varieties (Gortel, 2006; Singh *et al.*, 2011).

Localized. This particular type of demodex affects only a few regions of the body, typically the face. It appears as a tiny lesion on the face and is frequently found in pups. Most incidences of localized demodex will resolve without therapy as the puppy's immune system matures.

Generalized. This kind of demodex will affect bigger sections of skin, and maybe the entire body. Secondary infections are common with generalized demodex. These bacterial infections will produce severe itching and a foul odor. It might be tough to completely remove all mites.

Demodectic Pododermatitis. This form of demodex is exclusively found on the feet. It creates secondary bacterial infections between the pads and toes. This variety is the most difficult to completely treat. The clinical symptoms and management of *D. cornei*. The fat appears to be similar to that of *D. canis*.

Topical antimicrobial agents such as benzoyl peroxide and chlorhexidine may help treat localized demodectic lesions. The use of glucocorticoid-containing products is contraindicated and may promote disease spread. For generalized demodex, the injectable version of ivermectin should be administered orally at a daily dosage of 300 to 600 micrograms (Muller, 2004).

Topical amitraz is used to treat generalized demodex in dogs older than four months old. Amitraz, a miticide and insecticide, is a monoamine oxidase inhibitor (MAOI), prostaglandin synthesis inhibitor, and alpha 2 adrenergic agonist (Mueller, 2004).

MATERIAL AND METHOD

A study was conducted from July 2022 to January 2023 on a total of 24 canines, both male and female, who presented to the Veterinary Clinical Complex, CVAS, Bikaner, with the history of itchy alopecia, hyperpigmentation, and crust formation at specific areas on the body. The physiological parameters were found to be within the normal range after general clinical assessment. Examining deep skin scrapings revealed the presence of mites in the skin lesions that led to the diagnosis of demodex.

Collection of skin scraping. In all, 24 Skin scrapings were collected in order to look for mites. Using a blunt scarpel that had been adequately sterilised in 70% alcohol or over a gas flame, deep skin scrapings were taken. Deep skin scraping is very sensitive, inexpensive, and simple to do (Paolo, 2023). Rug In various body parts, particularly in locations where healthy skin transitions to a lesion and comedones are present, the skin scraping procedure needs to be thorough, consistent with hair growth, and performed.

The glass slide's center was marked with a drop of liquid paraffin. Before being collected, the scarpel's edge was dipped in liquid paraffin. The lesion was kept between the thumb and forefingers by pinching a fold of skin, and the crust of the fold was carefully scraped with a blade or blunt scalpel until the blood seeped out. After collecting the skin scraping samples, 5 ml of a 10% potassium hydroxide (KOH) solution was applied to a 15 ml glass centrifuge tube. After that, the substance was gradually heated until the debris fully dissolved. After that, the material was centrifuged for five minutes at a speed of 3000 revolutions per minute. A pipette was used to drain the supernatant fluid and deposit 1-2 drops of the sediment to a thin glass slide. The coverslip was then placed on the slide and checked for mites using a microscope with a low power lens (Shrestha *et al.*, 2015).

The treatment started with tablet Neomec (Ivermectin) 400mcg/kg body weight once daily orally until two consecutive negative results for *Demodex canis*, then tab Avil (25 mg) p.o. × 5 days. During this time, a bath with Ketochlor shampoo was recommended, followed by a bath with Ridd solution (3 ml in one liter of water). Syrup Nutriccoat was also administered orally. After three months of treatment, the canines recovered without occurrence, with all lesions healed.



Dermatological problem in a dog.



Demodex in skin scraping under microscope.

DISCUSSION

Demodex spp. mites are commensal parasites that live in the hair follicles and sebaceous glands of most animals (Hu and Zhang 2022). The current case was classified as a generalised demodicosis due to the occurrence of more lesions throughout the body (Satheesha *et al.*, 2016). Demodocosis diagnosis requires thorough skin peeling. Canine generalized demodicosis is treated multimodally, using a variety of drugs (Mueller, 2008). Canine demodicosis clinical signs and lesions could be caused by a variety of predisposing factors such as poor condition, malnutrition, and an abnormal environment that promotes mite proliferation and the development of skin disease, as supported by previous reports (Mueller, 2012; Shrestha *et al.*, 2015). The main reason for the use of broad spectrum antibiotics in this study is that the majority of canine cases of generalized demodicosis involve secondary bacterial skin infections, which require the use of systemic antibiotics for a few weeks in addition to acaricidal treatment, such as Amitraz (Verde, 2005; Mueller *et al.*, 2011). When combined with antibiotic therapy, amitraz is a very successful treatment for generalized demodectic mange (Horne, 2010).

CONCLUSIONS

Demodicosis was diagnosed in a large percentage of dogs with dermatological lesions. Long-term oral ivermectin, topical amitraz, and nutritional therapy are effective treatments for canine demodicosis.

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