www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(7): 1375-1377

www.thepharmajournal.com
Received: 03-04-2021
Accepted: 13-06-2021

Tradhnesh P
Veterinary Doctor (BVSc & AH), Kerala, India

Krishnakanth K
Veterinary Doctor (BVSc & AH), Kerala, India

Sreelakshmi SS
Veterinary Doctor (BVSc & AH), Kerala, India

Deepak Chandran
Assistant Professor, Department of Veterinary Sciences and Animal Husbandry, School of Agricultural Sciences, Amrita Vishwa Vidyapeetham University, Coimbatore, Tamil Nadu, India

Corresponding Author:
Deepak Chandran
Assistant Professor, Department of Veterinary Sciences and Animal Husbandry, School of Agricultural Sciences, Amrita Vishwa Vidyapeetham University, Coimbatore, Tamil Nadu, India

The efficacy of combination therapy of Ivermectin + Amitraz for successful therapeutic management of canine demodicosis: A case study

Tradhnesh P, Krishnakanth K, Sreelakshmi SS and Deepak Chandran

Abstract
Canine demodicosis (Demodectic mange) is a skin disease of dogs consisting of greater than normal numbers of Demodex mites. Localized demodicosis is a common mild and benign self-limiting disease. In contrast, generalized demodicosis is a serious and potentially life-threatening disease. Most cases of generalized demodicosis are juvenile in onset and develop in dogs less than 1 year of age. Dogs aged between four months to two years, in which five dogs reported with history of reddish lesion on the body mainly on the face region and showing intense pruritis were selected. Canine demodicosis represents a most perplexing treatment problem all over the world. The present study was aimed to determine the efficiency of combination therapy with subcutaneous injection of Ivermectin weekly intervals for upto 4 weeks, topical application of Amitraz at weekly intervals, immunomodulators orally and antibiotics to prevent secondary Pyoderma.

Keywords: Demodicosis, dermatitis, Ivermectin, Amitraz

1. Introduction
Skin is the largest organ of the body and forms the anatomical and physiological barrier between the animal and environment. It provides protection from the physical, chemical and microbiological injuries and its sensory components perceive heat, cold, pain, purities, touch and pressure. The skin, hair and sub cutis of a Newborn puppy represent 24 per cent of its body weight. By the time of maturity, these structures compose only 12 per cent of the body weight [1]. A good number of dogs and cats suffer from various dermatological cases; those due to parasites making up a major share. Among the skin diseases due to parasites, Demodectic mange may pose a diagnostic problem to the practitioner. Unlike in sarcoptic mange, the clinical signs are variable and may produce traps for the unwary; it is a great imitator of other skin diseases [2]. Canine demodicosis represents a most perplexing treatment problem. Generalized demodicosis is one of the severe skin diseases, which can often be fatal. More than 75 compounds have been tried for the treatment of demodicosis [3]. They include both topical medicaments from amitraz and systemic endectocides from ivermectin to the newly emerged, milbemycin oxime. Since an immunodeficiency is indicated in the pathogenesis of demodicosis, in combination with miticides, immunomodulators can be tried to minimize the treatment period [5, 6]. Demodectic Mange is caused by *Demodex canis*, which is located in the hair follicles and sebaceous glands of the skin. Approximately, 30 to 80 per cent of the normal canine populations are asymptomatic carriers of the mites. Although the mite is a normal inhabitant of the skin, it should be noted that a few dogs manifest the disease clinically. A hereditary element and presence of certain stress factors predisposing to the development of generalized demodicosis are evident and have been recognized [7]. This implies the importance of understanding the epidemiological factors associated with the disease occurrence. The present study was aimed to determine the efficiency of combination therapy with subcutaneous injection of Ivermectin weekly intervals for upto 4 weeks, topical application of Amitraz at weekly intervals, immunomodulators orally and antibiotics to prevent secondary pyoderma.

2. Materials and Methods
A study was conducted in dogs aged between four months to two years, in which five dogs reported with history of reddish lesion on the body mainly on the face region and showing intense pruritis were selected (as shown in Figure 1). Erythematous pappular crusty lesions were located all over the body mainly on the head, abdomen and the forelimbs.

Vaccination and deworming history were proper. Upon clinical examination, mucus membranes were seen as pale roseate, temperature ranged from 101 – 103.5 ^{0}C, respiration rate ranged from 15/min to 23/min and lymph nodes (particularly popliteal lymph nodes) were found to be enlarged. Diagnosis of the disease condition as demodicosis caused by cigar shaped *Demodex canis* mites (Figure 2) was confirmed through skin scrapping examination.

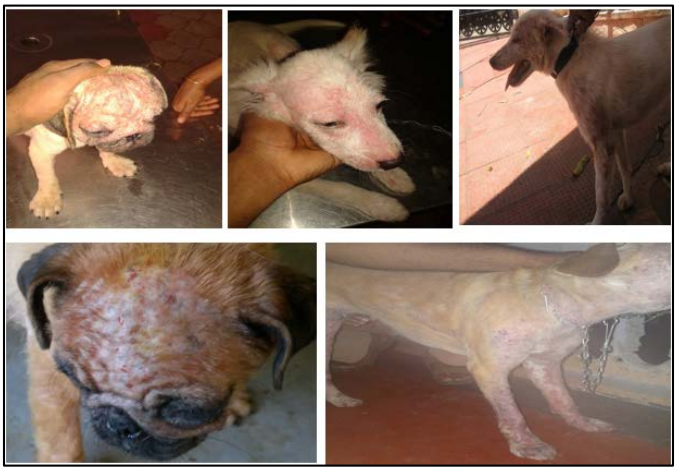

Fig 1: Five selected dogs affected with Demodicosis

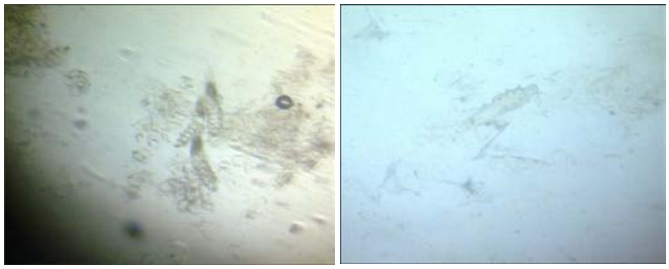

Fig 2: *Demodex canis* mites detected via skin scrapping examination

3. Treatment and Discussion

The dogs were treated with a combination therapy of subcutaneous administration of Ivemectin @ 600 mcg/kg body weight in weekly intervals, Petben shampoo (Benzyl Peroxide, act as follicular flushing agent) once in every 5 days and topical application of 12.5% RIDD (Amitraz) @ 1ml diluted in 1L water every 5 days. Other supportive therapies like Immunol syrup @ 3 to 5ml twice daily and Cephalexin tablets 250mg tabs @ 25 mg/kg twice daily for 45 days. Significant clinical improvement was noticed after 45 days of treatment.

Canine demodicosis (demodectic mange) is a skin disease of dogs consisting of greater than normal numbers of Demodex mites. Although most Demodex spp. are considered normal mammalian fauna, overgrowth of mites may be associated with development of patchy hair loss or mild to severe dermatitis in dogs and, infrequently, in cats. The entire life cycle is completed on the host in 18 - 24 days. The eggs are laid in hair follicles where larvae develop to nymphs then adults [1, 8]. Canine demodicosis may be localized or generalized, and both forms may present in either juvenile or adult dogs. Localized demodicosis is characterized by a mild, nonpruritic, patchy alopecia on the head or limbs. This form usually develops in puppies younger than 6 months of age, and most of these cases resolve spontaneously without treatment. This form consists of one to several circumscribed areas of hair loss usually around the eyes and muzzle. Erythema and scaling are present but pruritis is very little [9]. Generalized canine demodicosis is a moderate to severe disease that is generally attributable to an overgrowth of mites, which may occur as a result of underlying systemic disease or immunosuppression from various causes, possibly including malnutrition or endoparasitism in juveniles or chemotherapy, neoplasms, hypothyroidism, or hyperadrenocorticism in adult dogs. Generalized demodicosis is also frequently accompanied by secondary bacterial skin infections [2, 8, 9]. Areas of alopecia, scaling and erythema with pruritus are generalized. The most common organism present is *Staphylococcus pseudintermedius*. However, *Escherichia coli* or *Pseudomonas aeruginosa* may be the predominant species in some cases. This severe form is most often seen in dogs with a cell-mediated immune deficiency [10]. Juvenile on-set generalized Demodicosis has long been considered to be the result of an inherited immunologic defect, which is a functional abnormality associated with the cell-mediated (T-Cell) immune system. Immunosuppressive disease (hyperadrenocorticism, neoplasia diabetes mellitus, and hypothyroidism) can induce adult-onset demodicosis. Marked breed predilections and clustering in litters support a hereditary basis for juvenile-onset generalized demodicosis. Data suggests an autosomal recessive mode of inheritance [1]. Generalized canine demodicosis is characterized by the progression of multifocal, erythematous, partially alopecic, crusted macules that eventuate in plaques. crusted plaques, alopecia, and exfoliation are signs of more severe disease. Hyperpigmentation, lichenification, and scarring develop with chronic infection. Secondary bacterial infection with generalized deep folliculitis and furunculosis, occasional cellulitis, and tissue devitalization may contribute greatly to disease severity, morbidity, and mortality [2]. Hair loss may be surprisingly minimal in long-coated breeds with long anagen hair cycles such as the Maltese, Shih Tzu, Lhasa Apso, and Miniature Poodle; this may lead to a decreased suspicion for demodicosis [1, 4]. Although demodicosis has been recognized as a global parasitic disease that can be easily diagnosed, treatment options are few, and to achieve an adequate response to treatments extended, aggressive therapy is required [3]. Deep skin scrapings are the most reliable and frequently used method to diagnose demodicosis. An appropriate antimicrobial must be initiated according to product recommendations and continued for 1 to 2 weeks beyond clinical and microscopic resolution of the bacterial skin infection [5, 8]. Amitraz dip at 250 ppm applied topically every 2 weeks for three to six treatments is the only approved miticidal treatment for generalized demodicosis in many countries. Several series of treatment may be required to eliminate the mites for severe cases. If mite numbers do not decrease or lesions have not cleared after several weeks, alternative therapies like increasing concentration or frequency of Amitraz treatments, Milbemycin Oxime orally once daily for 60 to 90 days and Ivermectin orally once daily for 60 to 90 days [6, 7, 11, 12]. Treatment protocols should include antibacterial treatment for secondary pyoderma. Steroids are contraindicated in any kind of demodicosis [1, 2].

4. Conclusion

Canine demodicosis is a non-contagious parasitic skin disease caused by an overpopulation of the host-specific follicular mites of the genus Demodex. Most cases of canine demodicosis are caused by Demodex canis, although two other species of demodex mites are reported. Localized demodicosis is a common mild and benign self-limiting disease. In contrast, generalized demodicosis is a serious and potentially life-threatening disease. Most cases of generalized demodicosis are juvenile in onset and develop in dogs less than 1 year of age. This present study confirmed that treatment of demodicosis via combination therapy with subcutaneous administration of Ivermectin injection and topical application of Amitraz for about 45 days produced significant clinical improvement.

5. References

1. Scott DW, Miller WH, Griffin CE. Small Animal Dermatology, Fifth edition. WB Saunders Company, Philadelphia 2001.
2. Miller WH Jr, Griffin CE, Campbell KL. Parasitic skin disease. In: Muller and Kirk's small animal dermatology. 7th edition. St Louis, MO: Elsevier 2013, 284-342.
3. Mueller RS, Bensignor E, Ferrer L, *et al*. Treatment of demodicosis in dogs: 2011 clinical practice guidelines. Vet Dermatol 2011, 86-96.e21.

4. Ravera I, Altet L, Francino O, *et al*. Small Demodex populations colonize most parts of the skin of healthy dogs. Vet Dermatol 2013;24:168-172.e37.
5. Bhosale VR, Dakshinkar NP, Sapre VA, Bhamburkar VR, Sarode DB. Therapeutic management of canine demodicosis. Indian J Vet Med 2000;20(I):55.
6. Shirk ME. The efficacy of amitraz treatment for demodectic mange: a field study. Vet Med 1983;78:1059-1062.
7. Ladukar NO, Rode AM, Bhojne GR, Wankhade DK, Shrikhande GB, Rajguru DN. Study on efficacy of Ivermectin in Canine Demodicosis with special reference to histopathological changes. Intas Polivet. 2010;11(1):65.
8. Dimri U, Sharma MC. Epidemiology of skin infections in dogs in Western Uttar Pradesh. Indian Vet Med J 2000;24:323-324.
9. Demodex (mange mite) CAPC Vet. Available at http://www.capcvet.org/capc-recommendations/ demodex-mange-mite. Accessed 2016,12.
10. Benjamin MM. Outline of Veterinary Clinical Pathology. Indian reprint 2001. Kalyani Publishers, New Delhi 1985, 351.
11. Paterson TE, Halliwell RE, Fields PJ, *et al*. Canine generalized demodicosis treated with varying doses of a 2.5% moxidectin + 10% imidacloprid spot-on and oral ivermectin: parasiticidal effects and long-term treatment outcomes. Vet Parasitol 2014;205:687-696.
12. Hutt JH, Prior IC, Shipstone MA. Treatment of canine generalized demodicosis using weekly injections of doramectin: 232 cases in the USA (2002–2012). Vet Dermatol 2015;26:345-349.e73.