Haryana Vet. (June, 2020) **59(1),** 148-150

Clinical Article

PYODEMODICOSIS IN A GERMAN SHEPHERD DOG AND ITS THERAPEUTIC MANAGEMENT

L. NARAYANA RAO*, K. RAJESH, LAIMI ELIZABETH S.[1], B.B. MANASA and K. SURESH
Department of Veterinary Clinical Complex, [1]Department of Veterinary Medicine,
NTR C.V.Sc., Gannavaram-521 102, India

Received: 30.11.2019; Accepted:01.02.2020

SUMMARY

A seven-month-old German shepherd female dog was presented to hospital with history of alopecia and pruritus. Clinical examination revealed the presence of papules, crusts, exudates from lesions, hyper pigmentation, folliculitis and cellulitis. Upon skin scrapings and hair pluck examination, the mites of *Demodex* spp. were identified. *Staphylococcus* spp. was identified as the cause of secondary bacterial infection. Haemato-biochemical examination revealed anemia, leukocytosis, neutrophilia, lymphopenia, hypoproteinemia and hypoalbuminemia. The dog was treated with oral ivermectin @ 300µg/kg bwt, cefpodoxime proxetil @ 5 mg per kg b.wt. and supportive therapy using antacid, immunostimulant, essential fatty acids, hematinic and topical chlorhexidine gluconate and miconazole shampoo. Dog showed complete recovery after 45 days of therapy.

Keywords: Canine, Demodicosis, Ivermectin, Pyoderma

Canine demodicosis is an inflammatory, non-contagious parasitic dermatosis caused by the overpopulation of the host-specific follicular mites of various *Demodex* species (Shrestha *et al.*, 2015). *Demodex canis* is the most common species and is normal inhabitants of a hair follicle, and sebaceous glands. Demodicosis can be classified into localized and generalized (Shipstone, 2000) with juvenile or adult-onset. Most of localized demodicosis (90%) cases resolve spontaneously over 6-8 weeks period. Generalized demodicosis may be a severe and potentially life-threatening disease (Venkataramanan *et al.*, 2013)

It affects predominantly pure-bred dogs (Pereira *et al.*, 2012) and German shepherd is vulnerable to clinical demodicosis. Secondary bacterial infection of the hair follicles often occurs and rupture of the hair follicle wall may lead to the presence of free mites in the dermis leading to severe pyogenic infection (Kumar and Rao, 2008).

A seven months old German shepherd female dog was presented to the small animal medical ward with the history of decreased feed intake, hair fall, itching and discharges from the skin (Fig. 2). Clinical examination revealed pale mucous membranes, pyrexia, alopecia, folliculitis, pruritis, cellulitis, and hyper pigmentation of the skin. Most lesions were present at the face, forelimbs, and ear pinna. Skin scrapings, hair plucks were collected from skin lesions and were subjected for microscopic examination. Skin swabs were collected from pyoderma lesions using sterile swabs for isolation and identification of bacteria. The swabs were transferred into the nutrient broth and incubated at 37 °C for 24 hours. Then the inoculum was streaked on mannitol salt agar (MSA) and incubated at 37 °C for 24 hrs. The organism was identified based on characteristic growth like bright yellow color zones on mannitol salt agar medium and grape-like clusters of coccion Gram's staining. Five milliliters of blood was collected into EDTA and serum vacationer for hematobiochemical analysis before treatment and on 15th and 30th day after therapy.

Microscopic examination of skin scrapings and hair plucks revealed live carrot-shaped *Demodex* spp. mites (Fig. 1). Upon cultural examination of swabs collected from lesions on the skin, *Staphylococcus* species was identified as causative factor for secondary bacterial infection. Hemato-biochemical findings revealed anemia, leukocytosis, neutrophilia, lymphopenia hypoproteinemia and hypoalbuminemia (Table1).

The dog was treated with oral ivermectin (NEOMEC) @300 µg/kg body weight for 30 days and supportive therapy with pantoprazole (PANTOP) @1 mg/kg b.wt orally, Immunostimulant (Immunol), haemtinic (Fefolate) and omega-6, omega 3 fatty acids (Nutricoat Advance) @4 ml each twice daily orally. Secondary bacterial infection was treated with oral cefpodoxime (CEFPET) antibiotic @ 5 mg/kg b.wt daily for 15 days and weekly bath with chlorhexidine gluconate and Miconazole shampoo. Therapy was continued until two negative skin scrapings were obtained with an interval of two weeks. The dog showed improvement by 15th day after therapy with regression of skin lesions (Fig. 3). Examination of deep skin scrapings revealed dead and some live Demodex mites on 15th day and hemato-biochemical examination revealed anemia while other parameters reached near normalcy. On 30th day after therapy, the dog showed improvement in condition with disappearance of skin lesions and the scrapings were negative for mites. Treatment was further continued for 15 days. On 45th day after treatment, the skin scrapings examination was negative and the dog showed recovery with complete

*Corresponding author: lnrao402@gmail.com

Table 1

Pre and post-treatment hemato biochemical findings in affected dog

Parameter	Before treatment	After treatment		Reference values (Merck, 2010)
	0th day	15th day	30th day	
TEC (×106/µl)	5.2	6.0	6.5	5-7.9
TLC (×103/µl)	28.30	16.00	9.49	5-14 .1
Hb (g/dl)	8.3	10.0	12.6	12-19
PCV (%)	28.1	32.5	48.0	35-57
DLC (%)				
N	88	71	68	60-77
L	3	18	21	12-30
E	6	8	5	3-10
M	3	4	6	2-10
Total protein (g/dl)	4.9	5.4	6.1	5.4-7.5
Albumin (g/dl)	1.9	2.3	2.7	2.3-3.1
Globulin (g/dl)	3	3.1	3.4	2.4-4.4

Fig. 1. Skin scrapings positive for *Demodex* (0th day)

Fig. 2. Before therapy 0th day (owner applied turmeric paste on dog body)

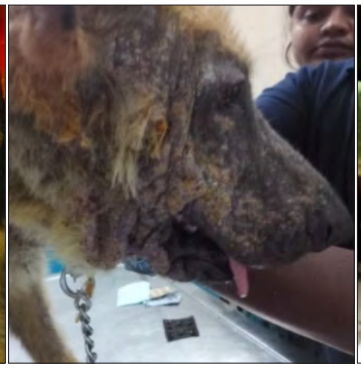

Fig. 3. 15th day of therapy

Fig. 4. 45th day (after therapy)

subsidence of clinical signs and improved hair growth (Fig. 4). Haemato-biochemical parameters reached near normalcy on 30th day after therapy.

Canine demodicosis is a common non-contagious, inflammatory parasitic skin disease resulting from excessive proliferation of *Demodex canis* mites within hair follicles and sebaceous glands (Singh *et al.*, 2011). Anemia, leukocytosis, and neutrophilia were major hematological alterations in canine demodicosis which may to due to toxins liberated by mites, reduced appetite and loss of blood during scratching. Decreased levels of serum total protein and serum albumin might be the result of the excessive breakdown of proteins due to trauma to skin and proliferation of mites.

The use of ivermectin in the treatment of canine demodicosis was first reported by Scott and Walton, 1985. Nambi *et al.*, 2010 evaluated the effectiveness of ivermectin at 300-600 µg/kgb.wt. daily orally for the treatment of generalized demodicosis in dogs. Treatment of Demodicosis is considered to be successful when dogs recover clinically and organisms are no longer present on body. Prolonged treatment protocol is needed for a complete cure in case of generalized demodicosis. Ivermectin is a macrolide that acts on glutamate gated and gamma-amino butyric acid (GABA) gated chloride channels in mite's nervous system, resulting in paralysis of sensitive endo and ectoparasites (Venkataraman *et al.*, 2013). Staphylococcus was the most common secondary bacterial invader in case of generalized demodicosis in dogs. Demodicosis is a major cause of secondary pyoderma, the follicular location of mites predisposes to bacterial folliculitis and furunculosis (Kumar and Rao, 2008).

Cefpodoxime with clavulanic acid is an effective, safe, and convenient antibiotic for the treatment of pyoderma in dogs without any side effects (Reddy *et al.*, 2014). Verde (2005) opined that treatment should be preceded by a shampoo such as a benzoyl peroxide in order to remove crust, debris and bacteria. Generalized demodicosis is caused by immunosuppression in adult dogs; hence, immunomodulatory drugs are helpful in enhancing the efficacy of ivermectin and antibacterials in

the treatment of generalized demodicosis and secondary pyoderma (Bhat and Bhagwat, 2010). Essential fatty acids (Omega 3 and omega 6) supplementation is required for the maintenance of epidermal barrier function. Omega 3 fatty acid promotes immune system counter mediators of inflammation. Omega 6-fatty acid promotes healthy skin integrity, improve cell membrane function and maintenance of lustrous hair coat.

Long term Ivermectin therapy could able to make complete recovery of generalized demodicosis in canine and combination with supplements like immunostimulant, haemtinic and omega -6, omega 3 fatty acids promotes faster recovery.

REFERENCES

Bhat, U.R. and Bhagwat, V.G. (2010). Study to assess the beneficial effects of immunol liquid in the management of canine pyoderma. *Vet. World.* **3(2)**: 78-81.

Kumar, S.K. and Rao, D.S. (2008). Therapeutic aspects of pyoderma associated with demodicosis in dogs. *Intas Polivet.* **9(1)**: 105-108.

Merck. (2010). Merck Veterinary Manaual (10th Edn.). Merck, Whitehouse Station, NJ.

Nambi, A.P, Kavitha, S. and Srinivasan, S.R. (2010). Evaluation of effectoforal ivermectin combined with oral antibiotic in the treatment of demodicosis in dogs. *Intas Polivet.* **11(1)**: 69-73.

Pereira, A.V, Pereira, S.A., Gremiao, I.D.F., Campos, M.P. and Ferreira, A.M.R. (2012). Comparison of acetate tape impression with squeezing versus skins craping for the diagnosis of canine demodicosis. *Aust. Vet. J.* **90(11)**: 448-450.

Reddy, B., Kumari, K., Vaikunta Rao, V. and Rayulu, V.C. (2014). Efficacy of cefpodoxime with clavulanic acid in the treatment of recurrent pyoderma in dogs. *ISRN Vet. Sci.* **1(12)**: 1-5.

Scott, D.W. and Walton, D.K. (1985). Experiences with the use of amitraz and ivermectin for the treatment of generalized demodicosis in dogs. *J. Am. Anim. Hosp. Assoc.* **21(4)**: 535-541.

Shipstone, M. (2000). Generalised demodicosis in dogs, clinical perspective. *Aust. Vet. J.* **78(4)**: 60-62.

Shrestha, D., Thapa, B., Rawal, G., Santosh, D. and Sharma, B. (2015). Prevalence of demodectic mangeincanines of Kathmanduvalley havings kind is order and its associated risk factors. *Int. J. Appl. Sci. Biotechnol.* **3(3)**: 459-463.

Singh, S.K, Kumar, M., Jadhav, R.K. and Saxena, S.K. (2011). An update on therapeutic management of canine demodicosis. *Vet. World.* **4(1)**: 41-44.

Venkataramanan, R., Sreekumar, C. and Gopi, H. (2013). Therapeutic management of generalized demodicosis-Areport of three canines. *Intas Polivet.* **14(2)**: 280-281.

Verde, M. (2005). Canine demodicosis: treatment protocol. Abstract published in proceedingsof North American Veterinary Conference held at Orlando, Canada on Jan 8-12, 2005. pp. 299-300.