



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2018; 6(6): 1012-1015

© 2018 JEZS

Received: 18-09-2018

Accepted: 19-10-2018

Desh Deepak

Division of Medicine, ICAR-
Indian Veterinary Research
Institute, Izatnagar, Bareilly,
Uttar Pradesh India

Alok Kumar Chaudhary

Division of Medicine, ICAR-
Indian Veterinary Research
Institute, Izatnagar, Bareilly,
Uttar Pradesh India

Supriya Yadav

Division of Medicine, ICAR-
Indian Veterinary Research
Institute, Izatnagar, Bareilly,
Uttar Pradesh India

Arvind Kumar Das

Division of Medicine, ICAR-
Indian Veterinary Research
Institute, Izatnagar, Bareilly,
Uttar Pradesh India

Pankaj Kumar Patel

Division of Medicine, ICAR-
Indian Veterinary Research
Institute, Izatnagar, Bareilly,
Uttar Pradesh India

Babul Rudra Paul

Division of Medicine, ICAR-
Indian Veterinary Research
Institute, Izatnagar, Bareilly,
Uttar Pradesh India

UK De

Division of Medicine, ICAR-
Indian Veterinary Research
Institute, Izatnagar, Bareilly,
Uttar Pradesh India

SK Dixit

Division of Medicine, ICAR-
Indian Veterinary Research
Institute, Izatnagar, Bareilly,
Uttar Pradesh India

Correspondence**SK Dixit**

Division of Medicine, ICAR-
Indian Veterinary Research
Institute, Izatnagar, Bareilly,
Uttar Pradesh India

Clinical investigation and therapeutic management of canine demodicosis with doramectin: A case study

Desh Deepak, Alok Kumar Chaudhary, Supriya Yadav, Arvind Kumar Das, Pankaj Kumar Patel, Babul Rudra Paul, UK De and SK Dixit

Abstract

A male German shepherd dog of age 7 months was presented to Referral Veterinary Polyclinic, IVRI with a history of chronic skin lesions on the face, around the ears, chin, neck and fore limbs. Clinical examination revealed presence of primary and secondary skin lesions mainly alopecia, follicular papules, pustules, scaling, foul smelling, crusting and bleeding tracts. Skin scrapping reveals the infestation of *Demodex* mites. Case was efficiently and safely managed by using subcutaneous injections of Doramectin at weekly intervals along with gram positive sensitive antibiotic boosted with supportive therapy. The combination was well tolerated by the dog and no significant alteration was observed in hemato-biochemical profile during and after the recovery period.

Keywords: Chronic skin lesions, follicular papules, demodex, doramectin

1. Introduction

Canine demodicosis is a refractory dermatopathic consequence in the dog as results of the pathological proliferation of *Demodex* mites predominantly present in the hair follicles. The *Demodex* mite is skin commensal transmitted from bitch to puppies in the first few days after birth^[5, 16]. The disease is mostly caused by mite *Demodex canis*, however others mites species like *Demodex injai* and *Demodex cornei* may also cause the disease^[22]. The course of the disease varies from acute self-limiting disease to chronic recurrent or long-lasting disease^[9]. The disease occurs in nature in two forms: localized and generalized^[19]. A generalized form is usually associated with secondary bacterial infection and requires vigorous and prolonged treatment^[10]. Diagnosis is rapidly and reliably confirmed by finding more than one mites per microscopic field in deep skin scraping^[21]. The general principle of mite-specific therapy is to necessary reevaluate dog every month for clinical finding, as well as numbers and stages of mites in skin scrapings and should be compared with observations of the previous visit. Ideally, treatment is continued till 4 weeks past the second negative monthly skin scraping^[11]. Many treatment options had been reported but success is limited to macrocyclic lactones and amitraz while other drugs evaluated, either were not efficacious or had unacceptable adverse effects. Macrocyclic lactones, Doramectin, at the dose rate of 0.6 mg/kg/wk by subcutaneous route has been reported to be efficacious in treating demodicosis^[7, 12]. Almost all dogs with generalized demodicosis have a secondary bacterial infection and should be treated systemic antibiotic along with supportive therapy. In the present study, we discussed on successful management of adult-onset generalized demodectic mange using macrocyclic lactone injection and evaluation of its adverse effect during and after therapy.

2. Materials and Methods

Based on history, clinical examination and skin scraping examination, the case was reliably confirmed for demodicosis.

2.1 Case History

A male German shepherd dog of age 7 months weighing around 20 kg was presented to Referral Veterinary Polyclinic of the institute with chief complains of chronic skin lesions for last one month on the face, around the ears, chin, neck, and forelimbs.

2.2 Clinical examinations and diagnosis

The clinical examination revealed the presence of primary and secondary skin lesions like alopecia, follicular papules, pustules, scaling, crusting (Figure: 1), bleeding tracts (Figure: 2) and foul odor. There was no evidence of fleas and its fecal dirt. Skin scrapping was collected in 10% potassium

hydroxide and was microscopically examined revealing the presence of more than one cigar shaped adult Demodex mites with four pairs of legs in the thoracic region (Figure: 2.1-2.3). The systematic investigation did not show any significant abnormality in the haemato-biochemical parameters.



Fig 1: Skin lesions on face



Fig 2: Skin lesions on fore limbs

2.3 Treatment







The case was treated with weekly subcutaneous injections of Doramectin @ 0.6 mg/kg body weight for six weeks and oral cephalosporin antibiotic @ 15 mg/kg body weight PO BID for 15 days to check the secondary bacterial infections. Benzyl peroxide shampoo was also weekly used to remove

crust and debris from the skin. Syrup Nutricoat advance @ 2 tsf PO twice daily for 20 days and antihistaminic tablet Levocetrizine @ 10 mg PO OD daily for 5 days for alleviating intense pruritis. The vitamin E @ 200 mg PO OD at alternate days for as an antioxidant.

Table 1: Pre and post therapy Hematological analytes and biochemical parameters

Erythrogram analytes				
Parameters	0 Day	21 Day	42 Day	References range
TEC ($\times 10^6/\mu\text{l}$)	4.87	5.88	5.08	5.5-8.5
Hb (gm/dl)	8	13	13	12-18
PCV (%)	30	38	35	37-55
MCV (%)	74	73	71	62-77
MCH (Pcg)	28	26	25	21-26.2
MCHC (gm/dL)	28	32	35	32-36
Leucogram analytes				
WBC ($/\mu\text{L}$)	22000	14500	13200	6000-17000
Neutrophils (%)	82	63	64	62-80
Lymphocytes (%)	10	23	23	10-28
Monocytes (%)	2	8	6	3-9
Eosinophils (%)	6	4	4	2-12
Basophils (%)	0	2	3	0-2
Biochemical parameters				
ALT(U/L)	51	38	38	60
AST(U/L)	45	65	42	50
ALP(U/L)	120	98	88	150
Total protein(g/dL)	8.9	5.7	5.6	6-8
Albumen(g/dL)	2.4	1.9	2.5	5-6
Globulin(g/dL)	6.5	3.8	3.1	3-5
A/G	0.36	0.5	0.8	0.59-1.11
Total Bilirubin (mg/dL)	0.5	0.6	0.52	0.07-0.061
Direct Bilirubin (mg/dL)	0.26	0.33	0.22	0.06-0.012
Indirect Bilirubin (mg/dL)	0.24	0.27	0.3	0.01-0.049
T4 (nmol/L)	29.3	28.5	29.8	19-58
TSH (nmol/L)	0.063	0.075	0.072	0.04-0.35
BUN (mg/dL)	22.8	20	16	10-20
Creatinine (mg/dL)	1.5	0.65	0.45	0.5-1.5

Table 2: Clinical case evaluation sheet

Recovery parameters	0 -day	14- day	42- day
Pustules	++++	++	--
Moisture	++++	----	-
Smell	++++	+	-
Pruritis	++++	++	-
Hair growth	-----	+	++++
Appetite	Anorexia	Inappetance	Normal
Photography			
Microscopic observation of mites	 Fig 2.1: More than one adult Demodex mites	 Fig 2.2: Marked improvement of condition	 Fig 2.3: Complete recovery

3. Results

The hemato-biochemical changes were estimated on day 0 (before therapy), day 21 and 42 after clinical evaluation, skin scraping and initiation treatment were also performed on same days. The findings of hematobiochemical changes, clinical evaluation and skin scraping examinations have been presented in Table 1.1 and 1.2. There was no significant alteration was observed in hemato-biochemical profile during and after recovery period. Appetite and hair coat has been markedly improved and skin scraping was negative for Demodectic mange after 42 days of therapy.

4. Discussion

Canine demodicosis is one of the frequently encountered Dermatopathy of canines as a result of the excessive proliferation of acarain parasite, *Demodex canis* associated with the development of cutaneous skin lesions and immunosuppression. The dogs suffering from *Demodex canis* reveals a wide variety of clinical manifestations. In the current case, the clinical manifestations like alopecia with follicular pustules, moist and hemorrhagic exudation were observed on the entire face and forelimbs around ears and eyes and in the interdigital space, pustules with draining tract and similar findings were also recorded by earlier authors [18, 2].

In the present case, hemato-biochemical parameters before initiation of treatment reveal leukocytosis, with neutrophilia, lymphopenia with eosinophilia and decrease in the value of PCV, Hb and TEC and it was in accordance to the earlier findings [1, 8, 20, 3, 16]. The decrease in the values of hemoglobin and TEC might be due to anemia caused by the loss of skin

protein or stress arising from the disease [4]. During therapy as well as recovery period all the parameters were restored within the normal range (Table 1). Lymphopenia was evident as cell-mediated immunity plays an important role in fighting against *Demodex* mites.

Biochemical analysis revealed no alteration in the level of AST, ALT, BUN, creatinine, total bilirubin, direct bilirubin, indirect bilirubin and A/G ratio before and after recovery and increased level of total serum protein, globulin and reduced albumin levels on the day of examination. The findings are in accordance with the earlier report [3]. Increase in total protein values might be due to increased inflammatory response associated with secondary bacterial infection, pyoderma. Hypoalbuminemia may be due to excessive break down of protein due to the trauma of skin and proliferation of mites and hyperglobulinaemia may be attributed to chronic skin disease [6]. The free T4 and TSH levels in the affected dog on day 0 were in normal range. Reddy *et al.*, (2014) reported that dogs with demodicosis did not show any significant difference in total T4 and free T4 levels. It was documented management of canine demodectic mange using Amitraz, Ivermectin, Milbemycin, Moxidectin and doramectin. Topical amitraz therapy was the first drug approved for canine generalized demodicosis. However, it is not always effective or well tolerated by the patient [14]. Use of macrocyclic lactones also has certain limitations because their prolonged use may be associated with adverse effects [10]. Doramectin is a new macrocyclic lactone that has been reported as a successful treatment for canine demodicosis [7, 12].

The case was successfully and safely treated with weekly

subcutaneous injection of Doramectin @ 0.6 mg/kg body weight for the duration of six weeks [7, 10] and antibiotics to prevent secondary bacterial infection. The syrup (Nutricoat advance) containing Omega 3, Omega 6, EPA and DHA was given @ 2 TSF BD daily for 20 days and antihistaminic Levocetirizine @ 10 mg SID daily for 5 days for alleviating intense pruritis. The essential fatty acids are useful for maintaining the health of the coat and help the pet to fight against allergies and various skin problems. Dimri *et al.* (2008) reported that demodicosis is associated with oxidative stress that predisposes dog for rapid proliferation of mites. Therefore, vitamin E as an antioxidant [15] (Capsule Evion) was given @ 400 mg PO at alternate day. Shampoo containing benzoyl peroxide (Petban) was also weekly used for follicular flushing and to remove debris from the skin.

5. Conclusion

From the findings of the present study, it is concluded that doramectin administered subcutaneously at weekly intervals along with supportive therapy is an effective and well-tolerated treatment for generalized canine demodectic mange.

6. References

- Arora N, Vohra S, Singh S, Potliya S, Lather A, Gupta A, *et al.* Therapeutic management of chronic generalized demodicosis in a pug. *Adv. Anim. Vet. Sci.* 2013; 1(2S):26-8.
- Ballari S, Balachandran C, George VT, Manohar BM. Pathology of canine demodicosis.
- Beigh SA, Soodan JS, Nazki S, Khan AM. Oxidative stress, hematobiochemical parameters, trace elements and vitamins in dogs with zinc responsive dermatosis. *Veterinarski arhiv.* 2014; 84(6):591-600.
- Deb AR, Jha MK, Prasad KD. Clinical and haematological changes in dogs infected with *Demodex canis*. *Journal of Research, Birsa Agricultural University.* 2000; 12(2):281-3.
- Gortel K. Update on canine demodicosis. *Veterinary Clinics: Small Animal Practice.* 2006; 36(1):229-41.
- Jain NC. Hemolytic anemia associated with some infectious agents. *Schalm's Veterinary Hematology,* 1986, 589-626.
- Johnstone IP. Doramectin as a treatment for canine and feline demodicosis. *Australian Veterinary Practitioner.* 2002; 32(3):98-103.
- Jyotsna P, Maiti SK, Sanyal PK, Tiwari SP. Haematobiochemical and mineral profiles in generalized canine demodicosis. *Intas Polivet.* 2005; 6(2):331-4.
- Manjul RS. Common dermatological disease by bacteria and fungi in pet dogs. *Indian J Fundam. Appl. Sci.* 2012; 2(2):207-9.
- Mueller RS. Applied dermatology: an update on the therapy of canine demodicosis. *Compendium,* 2012, 34(4).
- Mueller RS. Treatment protocols for demodicosis: an evidence-based review. *Veterinary dermatology.* 2004; 15(2):75-89.
- Murayama N, Shibata K, Nagata M. Efficacy of weekly oral doramectin treatment in canine demodicosis. *The Veterinary record.* 2010; 167(2):63.
- Nemec A, Drobníč-Košorok M, Skitek M, Pavlica Z, Galac S, Butinar J. Total antioxidant capacity (TAC) values and their correlation with individual antioxidants in healthy Beagles. *Acta Veterinaria Brno.* 2000; 69(4):297-303.
- Paradis M. New approaches to the treatment of canine demodicosis. *Veterinary Clinics: Small Animal Practice.* 1999; 29(6):1425-36.
- Patel PK, Patel SK, Dixit SK, Rathore RS. Gastritis and Peptic Ulcer Diseases in Dogs: A Review. *Int. J Curr. Microbiol. App. Sci.* 2018; 7(3):2475-501.
- Reddy BS, Kumari KN, Sivajothi S. Haematobiochemical findings and thyroxin levels in canine demodicosis. *Comparative Clinical Pathology.* 2015; 24(2):287-90.
- Sai YJ, WC, Chung LC, Wang YT, Ju CL, Hong YY, *et al.* The dog mite, *Demodex canis*: Prevalence, fungal co-infection, reactions to light and hair follicle apoptosis. *J. Insect Sci.* 2011; 11:76.
- Sarkar P, Mukherjee J, Ghosh A, Bhattacharjee M, Mahato S, Chakraborty A, Mondal M, Banerjee C, Chaudhuri S. A comparative analysis of immunorestitution and recovery with conventional and immunotherapeutic protocols in canine generalized demodicosis: a newer insight of immunotherapeutic efficacy of T11TS. *Immunological investigations.* 2004; 33(4):453-68.
- Scott DW, Miller WM, Griffin CE. Parasitic skin diseases. In: Muller, K. (ed) *Small animal dermatology,* 6th ed. W.B. Saunders, Philadelphia, 2001, 423-516.
- Singh SK, Dimri U, Sharma MC, Swarup D, Sharma B, Pandey HO, Kumari P. The role of apoptosis in immunosuppression of dogs with demodicosis. *Veterinary immunology and immunopathology.* 2011; 144(3-4):487-92.
- Soulsby E.J.L. Helminths, arthropods and protozoa of domesticated animals (of MSnig's Veterinary helminthology and entomology). *Helminths, arthropods and protozoa of domesticated animals (sixth edition of MSnig's Veterinary helminthology and entomology),* 1968.
- Tater KC, Patterson AC. Canine and feline demodicosis. *Vet. Med,* 2008, 444-461.