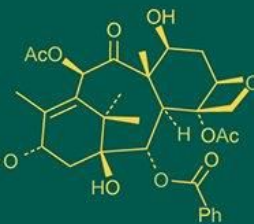
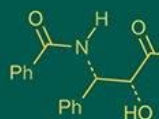


International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693
ISSN Online: 2617-4707
IJABR 2024; SP-8(12): 1271-1274
www.biochemjournal.com
Received: 20-09-2024
Accepted: 26-10-2024

Bandi Geetika
Department of Veterinary
Medicine, Rajiv Gandhi
Institute of Veterinary
Education and Research,
Puducherry, India

A Abiramy
Department of Veterinary
Medicine, Rajiv Gandhi
Institute of Veterinary
Education and Research,
Puducherry, India

Bandi Eswara Rao
Department of Livestock
Products Technology, NTR
College of Veterinary Sciences,
Gannavaram, Andhra
Pradesh, India

N Devadevi
Department of Veterinary
Medicine, Rajiv Gandhi
Institute of Veterinary
Education and Research,
Puducherry, India

Corresponding Author:
Bandi Geetika
Department of Veterinary
Medicine, Rajiv Gandhi
Institute of Veterinary
Education and Research,
Puducherry, India

A case of demodicosis in a dog successfully managed with Nexgard®

Bandi Geetika, A Abiramy, Bandi Eswara Rao and N Devadevi

DOI: <https://doi.org/10.33545/26174693.2024.v8.i12Sp.3316>

Abstract

A one-year-old male husky dog weighing 20kg presented a skin problem with itching, rough hair coat, alopecia, erythematous lesions on the periorbital area, lips, cranial and caudal extremities along with foul body odor. Microscopic examination of deep skin scrapings revealed presence of *Demodex canis*. Hematological analysis indicated that the dog presented anemia. The therapy provided consisted of inj. Meloxicam @ 0.2 mg/kg BW and inj. Anistamin @ 0.3 mg/kg BW intramuscularly. Oral antiparasitic drug of isoxazoline group, Nexgard® @ 2.5 mg/kg BW once monthly, along with Tab. Nepocet®-CV @ 10 mg/kg BW, Tab. Cetirizine OD and syrup Sardine oil 10 ml OD for 2 weeks. Additionally, supported with topical antibiotic and shampoo. After 2weeks of treatment, observed that the dog's condition had improved, indicated by a reduction in the intensity of scratching and erythema. Nexgard® considered as a choice of drug for canine demodicosis. Multivitamins and hair supplements should be supportive therapy against generalized canine demodicosis.

Keywords: Husky, demodicosis, *Demodex canis*, Nexgard®

Introduction

Dogs are considered the closest creatures to humans due to their well-built social behaviours. However, these dogs are occasionally encountered with numerous dermatological problems that often force them to isolate themselves (Wahyudi *et al.*, 2020) [15]. Dermatological cases account for 12%–75% in small animals and demodicosis is a major skin problem in dogs (Kumar *et al.*, 2018). Different mites of cause Demodicosis, which includes *Demodex canis*, *Demodex cornei* and *Demodex injai* (Shrestha *et al.*, 2015) [11].

Canine Demodicosis is mainly caused by *Demodex canis* residing on the hair follicles than other species. They are the most common microfauna in the skin of healthy dogs (Plant *et al.*, 2011, Ravera *et al.*, 2013) [8, 9]. Suppression in the skin's immune system helps mites flare up, leading to clinical demodicosis. Demodicosis is usually seen in old dogs and young puppies aged 3 months to one year (Mueller *et al.*, 2012) [5, 6]. It is noncontagious and is acquired from the dam during nursing (Sivajothi *et al.*, 2013) [12]. *Demodex* mites spend their entire life cycle within their hosts and feed on skin cells, sebum, and epidermal debris (Gortel, 2006) [2].

Localized demodicosis consists of one or several areas of alopecia that localized to a specific part of the body, with a size of 3-5cm and a circular shape (Wahyudi *et al.*, 2020) [15]. Localized demodicosis, lesions are characterized by scattered alopecia, comedones and erythema and in generalised form lesions are found in whole skin areas (Shipstone, 2000) [10]. Young dogs are mostly affected by localized form of demodicosis but frequently recover (Shrestha *et al.*, 2015) [11]. The generalized form is life-threatening because of the addition of secondary bacterial infection (Mueller *et al.*, 2012) [5, 6].

The clinical manifestations of demodicosis are local or diffuse erythema, alopecia, crusts or scales linked with pustular or papular dermatitis (Kuznetsova *et al.*, 2012) [5]. Demodicosis can be diagnosed through clinical history, Clinical signs and laboratory examinations, such as deep skin scraping (Nwoha, 2011) [7].

Materials and Methods

Signs and Symptoms

A male husky dog, aged one year and weighing 20 kg, brought to the animal clinic in

Puducherry. The dog has a white colour and a sturdy posture.

Anamnesis

The pet owner brought their patient, a husky dog, to the animal clinic. According to the owner's statement, the dog has presented complaints for almost the past one month, including erythema, especially in the extremities and facial area as well as a foul odor body. The patient appears to scratch frequently and has cachexia. The animal is regularly vaccinated and dewormed.

Clinical Examination

Clinical examination performed through inspection, palpation, percussion, and auscultation of the patient. The analysis of the patient status indicated a body temperature average of 104.3°F, swollen lymph nodes and congested mucus membrane. Heart rate frequency at 80 beats per minute, pulse rate at 86 beats per minute, average capillary refill time (CRT) at <2 seconds and average respiratory rate at 11 breaths per minute.

Diagnosis

Sample collection

Skin scrapings were collected from the skin lesions of infected dogs. At first, hair from the collection site was removed or clipped with scissors. Scraping of skin was carried out in the direction of hair growth till bleeding. A drop of liquid paraffin was put on the centre of the glass slide. The edge of the scalpel was dipped into liquid paraffin. Accumulated debris is then transferred onto the slide with liquid paraffin and examined under 4X to 10X magnification. Skin scrapings revealed positive for *Demodex canis* and the case was diagnosed as demodicosis. (Figure 1).



Fig 1: Microscopic examination of deep skin scraping positive for *Demodex* mite under 10 X and 40 X

Supporting examinations

Hematology and blood chemistry examinations conducted by collecting blood from the dog's cephalic vein using a 24G syringe. Two millilitre of blood will be collected in potassium EDTA for complete hemogram. Four millilitre of

blood will be collected in clot activator for serum separation.

Haematology

Haematology includes Haemoglobin (HGB) (g/dL), Hematocrit (HCT) (%), Total Leucocyte count (TLC) ($\times 10^3/\mu\text{L}$), Differential Leucocyte count (DLC) (%).

Serum Biochemistry

It involves estimation of BUN (mg/dL), creatinine (mg/dL), total protein (g/dL), albumin (g/dL), ALT(U/L), AST(U/L), ALP(U/L).

Results and Discussion

Results based on the clinical examination, several clinical findings were observed in the dog, including dullness, alopecia, erythema in the face, periorbital area, cranial and caudal extremities and foul body odour. (Figure 2).



(A)



(B)

Fig 2: Alopecia, hyperpigmentation and erythema in the periorbital area (A), lips (B)

The results of the haematological examination of the dog, in this case, can be seen in (the blue colour indicates deficient from standard) Table 1, while the results of the blood chemistry examination can be seen in Table 2. The hematological examination results showed normal levels of white blood cells (WBC), granulocytes, lymphocytes, and monocytes. However, there was a decrease in the HCT (Hematocrit) level and a decrease in the HGB (Hemoglobin) level, indicating a condition of anemia.

Table 1: Result from Hematological Examination

Parameter	Result	Reference Range
HCT(%)	26.6	37-55
HGB(g/dL)	9.5	12-19
TLC($\times 10^3/\mu\text{L}$)	15	6-17
DLC(%)	N-79, L- 18, E-1, M-2	N-60-75 L-8-21 E-2-10 M-2-10 B-0-1

Table 2: Results of Blood Chemistry Examination

Parameter	Results	Reference Range
BUN (mg/dL)	11	10-28
Creatinine (mg/dL)	0.61	0.5-1.5
Total protein (g/dL)	6.2	5.4-7.1
Albumin (g/dL)	2.1	2.6-3.3
Globulin (g/dL)	4.1	2.7-4.4
AST (U/L)	57	23-66
ALT (U/L)	30	21-102
ALP (U/L)	69	20-156

Therapy

The therapy provided consisted of inj. Meloxicam @0.2mg/kg BW and inj. Anistamin @ 0.3 mg/kg BW intramuscularly. Oral antiparasitic drug of isoxazoline group, Nexgard® @ 2.5 mg/kg BW once monthly, along with Tab. Nepocéf®-CV @ 10 mg/kg BW, Tab. Cetirizine OD and syrup Sardine oil 10 ml OD for 2 weeks. Additionally, supported with topical antibiotic and shampoo. After 2 weeks of treatment, observed that the dog's condition had improved, indicated by a reduction in the intensity of scratching and erythema. Nexgard® considered as a choice of drug for canine demodicosis. Multivitamins and hair supplements should be supportive therapy against generalized canine demodicosis. After 2 weeks of treatment, observed that the dog's condition had improved, indicated by a reduction in the intensity of scratching and erythema. (Figure 3).

**Fig 3:** Recovery 14 weeks post treatment

Discussion

Based on the dog's clinical examination results, erythema shown in the facial and extremities areas. The microscopic examination of deep skin scraping revealed demodicosis. Demodicosis has no age predisposition. Juvenile onset demodicosis affects puppies under 12-24 months of age. Adult onset demodicosis affects dogs over four years of age.

In this case, it falls under the category of juvenile-onset demodicosis based on the age.

Demodex sp. has a tendency in dogs' skin tissue and sebaceous glands, but the parasite number increases once the immune system drops or during stressful conditions. *Demodex* species have elongated, tapered bodies measuring 0.1- 0.4 μm , with four pairs of legs that terminate in tiny blunt claws in adult mites. *Demodex* lacks setae on the legs and body. The legs are located at the front of the body, so the opisthosoma comprises at least half the length of the body (Taylor *et al.*, 2016) [13]. Clinical signs in dogs with demodicosis are alopecia, erythema, scales, and pustules. Clinical symptoms that occur in dogs include hair loss, pruritus, skin lesions, erythema and hyperpigmentation (Wirawan *et al.*, 2019) [16].

The hematological examination revealed that the dog experienced anemia, which indicated by a markable decrease in hemoglobin levels and a reduction in haematocrit. The anemia condition in demodicosis cases is caused by the loss of proteins in the skin (Hasanah *et al.*, 2021) [3]. The infestation of parasites cause a decrease in hemoglobin and erythrocyte values, resulting in anemia. The low erythrocyte count in dogs can be caused by excessive blood loss, destruction of erythrocytes, or low production of erythrocytes. The age of the dog also affects bodily functions, including erythrocyte production, which can lead to anemia. Hemoglobin serves as a parameter to measure the condition of anemia (Erwin *et al.*, 2020) [1].

Until recently, control of ectoparasites on dogs relied largely on topical application of insecticidal/acaricidal compounds. Although some agents have shown systemic activity, systemic efficacy has been limited to immature stages of fleas, and none of the topical agents provided useful activity against both fleas and ticks. Isoxazolines represent a class of compounds with useful activity against insects and acarines. Based on preliminary efficacy and safety information, and a novel mechanism of action, a naphthalene isoxazoline, afoxolaner, was selected as the lead candidate for further development as a product that could provide extended efficacy against ectoparasites of dogs when administered orally in a palatable dosage form. Afoxolaner was formulated as a non-meat-based chewable dosing form designed for monthly oral administration and was developed and registered as NexGard®, the first product to effectively control both fleas and ticks on dogs for a month after oral treatment (Xu *et al.*, 2017) [17].

Conclusion

From the present case study could conclude that NexGard®, considered as a choice of drug for canine demodicosis. Multivitamins and hair supplements should be supportive therapy against juvenile canine demodicosis.

Acknowledgment

The authors acknowledge all members of the NexGard and NexGard Spectra development teams and supporting functional groups who contributed to the successful registration of these products.

References

1. Erwin E, Rusli R, Jones FD. Profil darah pada kucing selama proses kesembuhan luka melalui teknik skin flaps rotasi yang dirawat dengan dry dressing dan moist dressing. J Trop Anim Vet Sci. 2020;10(1):37-44.

2. Gortel K. Update on canine demodicosis. *Vet Clin North Am Small Anim Pract.* 2006;36(1):229-241.
3. Hasanah PN, Soma IG, Erawan IGMK. Laporan Kasus: Keberhasilan Memulihkan Demodekosis General pada Anjing Pomeranian Betina dalam Tempo Satu Bulan. *Indonesia Medicus Veterinus.* 2021;10(3):504-516.
4. Kumar A, Das AK, Sinha M, Arya SK, Kumar A, Kumar B. Study on the prevalence of demodectic mange in dogs in and around Patna. *Int J Curr Microbiol Appl Sci.* 2018;7.
5. Kuznetsova E, Bettenay S, Nikolaeva L, Majzoub M, Mueller R. Influence of systemic antibiotics on the treatment of dogs with generalized demodicosis. *Vet Parasitol.* 2012;188(1-2):148-155.
6. Mueller RS, Bensignor E, Ferrer L, Holm B, Lemarie S, Paradis M. Treatment of demodicosis in dogs: 2011 clinical practice guidelines. *Vet Dermatol.* 2012;23(2):86-e21.
7. Nwoha RI. Demodecosis in a dog. *Afr J Clin Exp Microbiol.* 2011;12(3):133-135.
8. Plant JD, Lund EM, Yang M. A case-control study of the risk factors for canine juvenile-onset generalized demodicosis in the USA. *Vet Dermatol.* 2011;22(1):95-99.
9. Ravera I, Altet L, Francino O, Sanchez A, Roldan W, Villanueva S. Small *Demodex* populations colonize most parts of the skin of healthy dogs. *Vet Dermatol.* 2013;24(1):168-e37.
10. Shipstone M. Generalised demodicosis in dogs, clinical perspective. *Aust Vet J.* 2000;78(4):240-242.
11. Shrestha D, Thapa B, Rawal G, Dhakal S, Sharma B. Prevalence of demodectic mange in canines of Kathmandu Valley having skin disorder and its associated risk factors. *Int J Appl Sci Biotechnol.* 2015;3(3):459-463.
12. Sivajothi S, Reddy BS, Rayulu VC. Demodicosis caused by *Demodex canis* and *Demodex cornei* in dogs. *J Parasit Dis.* 2013;39(4):673-676.
13. Taylor MA, Coop RL, Wall R. *Veterinary parasitology.* 4th ed. 2016.
14. Ugbomoiko US, Ariza L, Heukelbach J. Parasites of importance for human health in Nigerian dogs: high prevalence and limited knowledge of pet owners. *BMC Vet Res.* 2008;4(1):49.
15. Wahyudi G, Made SA, I Putu GYA. Demodicosis pada Anjing Jantan Muda Ras Pug Umur Satu tahun. *Indonesia Medicus Veterinus.* 2020;9(1):45-53.
16. Wirawan IG, Widiastuti SK, Batan IW. Laporan Kasus: Demodicosis Pada Anjing Lokal Bali. *Indonesia Medicus Veterinus.* 2019;8(1):9-18.
17. Xu M, Long JK, Lahm GP, Shoop WL, Cordova D, Wagerle T, *et al.* The Discovery of Afoxolaner: A New Ectoparasiticide for Dogs; 2017.