

DEMODICOSIS IN DOGS AND ITS THERAPEUTIC MANAGEMENT

N.R.Pradhan, S. Chatterjee, and C.Lodh

Department of Veterinary Medicine, Ethics & Jurisprudence; West Bengal University of Animal & Fishery Sciences, Kolkata.

Dogs are prone to many systemic & specific diseases of which skin diseases are very problematic & obstinate. Amongst the dermatological complications, demodectic mange infection is very common in them, showing alopecia, erythema, pustules and pruritus etc. which ultimately leads to concomitant bacterial and fungal infections. This study was undertaken to observe the clinical and haematobiochemical changes in demodectic mange infections in dogs and the effectiveness with treatment of some allopathic and herbal preparations.

Materials and Methods

The study was conducted in the Dog ward under the Department of Veterinary Medicine, Ethics and Jurisprudence and in some private veterinary clinics in and around Kolkata. The dogs which were brought to the clinics with skin lesions were selected and examined clinically. Their skin scrapings were taken and examined directly or by sedimentation method with 10% KOH solution.

Blood samples were collected from the affected dogs showing demodicosis for detailed haematological and blood biochemical analysis and estimations were done by standard techniques.

The demodectic dogs with concomitant bacterial and fungal infections were treated with antibiotics and antifungal therapy and with antipruritic drugs. Twenty four clinical cases of generalised demodectic mange infected dogs were divided in 2 groups (Gr-II) and Gr.-II) comprising 12 in each. Another 12 normal

healthy dogs were also taken as healthy control group (Gr-I).

The Gr-II animals were treated with Inj.Mectin¹ given S/Cly @ 1 ml/20Kg b.wt. at 7 days intervals for four occasions, Petben shampoo² for bathing at 5 days intervals for 6 occasions and topical applications of Ridd³ by sponge on the body @ 3ml/lit. of water at 5 days intervals for 6 occasions.

The Gr-III dogs were treated with herbal medicines like topical application of Zerokeet lotion⁴ @ 1:2 dilution with water once daily for 10 days and then on alternate days for another 20 days, Charmaid capsule⁵ @ 1-2 caps. orally once daily for 15 days and then 1-2 caps orally on alternate days for another 15 days along with local application of Newcharm ointment⁶ once daily for 15 days.

Results and Discussion

Out of 1240 dogs examined, 122 dogs (9.83%) had skin lesions and 38 dogs (3.06%) were positive for demodicosis and simulated with the findings of Chakrabarti and Pradhan (1985) who recorded 3.76% cases of canine demodicosis. The incidence was more in female than the male dogs and highest in Dachshund breed followed by other breeds of dogs. Higher incidence of demodicosis was noted in the younger age group of dogs and corroborated with the observations of Reddy and Rao (1992) and Kim and Kim (1997) and might be due to more stimulation of sebaceous glands by the sex hormones during puberty and the mites which get more opportunity to grow and multiply since they are sebophilic (Schwartzman, 1962).

-
1. Mectin (M/S Alembic) contain 1% (W/V) Ivermectin
 2. Petben (M/S Pet care, Tetragon Chemie Pvt. Ltd.) contain 2.5% (W/V) Benzoyl Peroxide)
 3. Ridd (M/S Pet care, Tetragon Chemie Pvt. Ltd.) contain 12.5% (W/V) Amitraj.
 4. Zerokeet⁴ a herbal product of M/S. Ayuvet Ltd.
 5. Charmaid⁵ a herbal product of M/S. Ayuvet Ltd.
 6. Newcharm⁶ a herbal product of M/S. Ayuvet Ltd.

The demodectic dogs showed erythema, pruritus, papules and alopecia etc. before treatment showed gradual improvements and the skin

became glossy and regained its normal texture and colour within 30 days of treatment in both Gr-II and Gr-III dogs.

Table-1 Haematological and blood biochemical changes of Demodectic mange infected dogs before and after treatment.

Parameters	Healthy control (n=12) (Gr. – I)	Before treatment (Demodectic dogs) (n=24)	After treatment	
			Allopathic treatment (n=12) (Gr. – II)	Herbal treatment (n=12) (Gr.-III)
Haemoglobin (gm/dl)	12.51 ± 0.561	9.45 ± 0.482**	12.32 ± 0.417 ^{φφ}	12.19 ± 0.236 ^{φφ}
TEC (10 ⁶ /cmm)	5.98 ± 0.628	3.94 ± 0.112**	5.64 ± 0.409 ^{φφ}	5.72 ± 0.327 ^{φφ}
TLC (10 ³ /cmm)	11.42 ± 0.121	11.57 ± 0.012	11.06 ± 0.318	11.17 ± 0.610
Neutrophil (%)	68.51 ± 0.597	72.29 ± 0.612**	67.28 ± 0.387 ^{φφ}	68.79 ± 0.414 ^{φφ}
Lymphocyte (%)	21.96 ± 0.484	15.41 ± 0.591**	23.16 ± 0.271 ^{φφ}	22.13 ± 0.306 ^{φφ}
Monocyte (%)	4.34 ± 0.351	4.19 ± 0.492	4.49 ± 0.327	4.15 ± 0.210
Eosinophil (%)	5.19 ± 0.315	8.11 ± 0.250**	5.07 ± 0.126 ^{φφ}	4.93 ± 0.301 ^{φφ}
Serum total Protein (gm/dl)	6.84 ± 0.341	6.45 ± 0.197	6.72 ± 0.219	6.61 ± 0.192
Serum albumin (gm/dl)	3.17 ± 0.212	2.38 ± 0.152**	3.08 ± 0.209 ^{φφ}	3.19 ± 0.176 ^{φφ}
Serum Globulin (gm/dl)	3.67 ± 0.126	4.07 ± 0.117	3.64 ± 0.107	3.42 ± 0.154
A:G ratio	0.86 ± 0.218	0.58 ± 0.109**	0.84 ± 0.262 ^{φφ}	0.93 ± 0.248 ^{φφ}

** Significant at 1% level (P<0.01) in comparison to healthy control group.

^{φφ} Significant at 1% level (P<0.01) in comparison to before treatment values.

From the table – 1, it is revealed that both the mean haemoglobin (Hb) % and total erythrocytic (TEC) count reduced significantly (P<0.01) in the demodectic dogs in comparison to the healthy control dogs and it might be due to anaemia developed due to loss of protein from the skin.

But following treatment with ivermectin and amitraj etc. in Gr.II, both the Hb and TEC levels increased and simulated with the observations of Roy *et al.*, (1991) and Mukhopadhyay (1999) who treated the demodectic dogs with amitraj and ivermectin. Similarly in Gr.III with herbal therapy, the said values also improved significantly (P<0.01), but the values could not be compared due to non-availability of similar data. However Roy *et al.*, (1996) and Sharma and Paul (2002) also noted clinical improvements in demodectic dogs with treatment of Zerokeet and Charmaid.

The mean total leucocytic count (TLC) of the demodectic dogs was found slightly higher than the healthy control dogs and is might be due

to pyoderma which is generally associated with demodicosis in dogs (Nesbitt, 1983). However following treatment with antibiotics and the allopathic medicines in Gr.II, it declined and agreed with the observations of Mukhopadhyay (1999) who also treated with antibiotics, ivermectin and amitraj. The TLC level also declined in Gr.III, might be due to antibacterial effects of Zerokeet, Charmaid and Newcharm herbal preparations.

The table-I, also showed, that there was significant increase (P<0.01) of neutrophil count and significant decrease (P<0.01) of lymphocytic count in the demodectic dogs in comparison to the healthy control dogs. Similar observations were also noted by Toman *et.a.*, (1997) in dogs with *D.Canis* infection. Neutrophilia is due to pyoderma and lymphopaenia which could be due to *T-Cell* suppression resulting from certain blastogenesis suppressing factors present in the sera of demodectic dogs (Scott *et al.*,1974). But following therapy with antibiotics, Mectin, Petben shampoo and Ridd in Gr.II, both the

Values became almost normal and agreed with the observations of Mukhopadhyay (1999). In Gr.III, the values also became almost normal, but could not be compared due to nonavailability of similar report.

eosinophil percentages in the demodectic dogs was significantly higher ($P<0.01$) than the healthy control dogs. Dimri *et al.*, (2000), opined *D.Canis* causes irritation of the skin tissues and stimulates the mast cells for release of more histamine and since histamine is chemotactic for eosinophils, an elevated histamine level attract eosinophils from the bone marrow to the circulation leading to eosinophilia. Besides eosinophilia is assumed to be also due to liberation of protein or secretory products of the parasite. But following treatment with Mectin and Ridd, the level became normal and corroborated with the observations of Mukhopadhyay (1999) who also treated with ivermectin and amitraj. In Gr.III, the level also became normal with the herbal therapy.

From the table-I, it is also evident that the total serum protein level decreased moderately in the demodectic dogs in comparison to healthy control dogs as also noted by Gupta *et al.*, (2001) and it might be due to loss of protein from the skin as remarked by Muller *et al.* (1989). But following treatment in Gr.II, the level increased as also observed by Sarkar (2002) with treatment of amitraj in demodectic dogs. In Gr.III, with herbal therapy, the mean level also increased.

The serum albumin level decreased significantly ($P<0.01$) in demodectic dogs as also observed by Gupta *et al.*, (2001) and Bera (1998), but following treatment at the end of the experiment, it became normal which was also observed by Sarkar (2002).

However the mean serum globulin level was noted slightly elevated in demodectic dogs than the healthy dogs as also recorded by Dimri (1995) and Sarkar (2002), but became normal following treatment in both Gr.II and Gr. III.

There was significant ($P<0.01$) decrease of A:G ratio in the demodectic dogs in comparison to the healthy dogs and corroborated with the findings of Bera (1998) and Gupta *et al.*, (2001), but following treatment in Gr.II, the value became normal and resembles with the

The monocyte percentage slightly varied before and after treatments in both the groups, but the

observations of Sarkar (2002). It became normal in Gr. III also with herbal therapy.

Soclam *et al.* (1997) opined that the use of ivermectin, the ectoparasiticide agent alone is 50% effective against *D.Canis* given S/Cly but when used in combination with amitraj locally and also with antibiotics is 100% effective. The Petben shampoo used in this study, contains benzoyl peroxide has a powerful follicular flushing activity, removes the scales, glandular secretions, crusts and tissue debris and thus it helps for better penetration of amitraj into the target tissues containing mites.

Therefore the gradual improvements of skin lesions as well as haematological and biochemical parameters in Gr.II, were due to synergistic effects of Mectin injection, Ridd lotion and Petben shampoo.

Similarly in Gr.III, there was also marked improvements in clinical signs as well as in haematobiochemical parameters with herbal therapy of Zerokeet lotion, Charmaid capsules and Newcharm ointment in the demodectic infected dogs.

Chhabra and Saxena (1998) recorded the effectiveness of Zerokeet in canine demodicosis and opined that the phytotherapeutic constituents of Zerokeet act in synergism and enhances the insecticidal and repellent activities. They also opined, the herbal ingredients stops the growth, inhibits the reproduction of mites, stop development of eggs and sterilizes the adults.

Charmaid capsule contain *Curcuma longa* is very useful in scabies (Kirtikar and Basu 1996), *Allium sativum* has antiseptic effect (Anjria *et al.*, 2002). Sharma and Paul (2002) opined Charmaid has an antimicrobial, anti-inflammatory and antipruritic actions in skin infections and it helps in prompt healing. Besides the Newcharm ointment used in this study has the antimicrobial, antiparasitic and miticidal actions against the skin parasites as opined by Sharma and Paul (2002). Therefore the combined use of these three herbal preparations were found useful in healing of skin infections of demodicosis in

dogs as well as useful in haematobiochemical improvements in demodectic dogs of Gr.III.

References

- Anjaria, J.; Parabia, M. And Dwived, S.(2002) Ethnovet Heritage, Pathik Enterprise, Ahmedabad.
- Bera, A.K. (1998). Polyunsaturated fatty acids : as an adiunct therapy in canine acariosis. M.V.Sc. thesis submitted to the I.V.R.I., Izatnagar, Uttar Pradesh.
- Chakrabarti, A. And Pradhan, N.R.(1985). Demodicosis in livestock of West Bengal (India). *International Zoonoses*, **12**:283-290.
- Chhabra, M.B. and Saxena, M. J. (1998) the use of phytotherapeutic agents for the control of acariasis in animals.*Jrnl.Vet Para.* **12**(1):3-8.
- Dimri, U. (1995). Ph.D. Thesis. Indian Vety. Research Institute, Izatnagar, Uttarpradesh.
- Dimri, U.; Sharma, M.C.; Kalicharan and Dwivedi, P. (2000). Clinicobiochemical and Histopathol-ogical alterations in demodectic mange in canines with special reference to ivermectin therapy. *Indian J. Vet. Pathol.*, **24**:23-25.
- Gupta, G.C.; Rajora, V.S. and pachauri, S.P. (2001). Clinico-biochemical studies in dermatological diasorders in dogs. XIX annual convention of ISVM, Jammu and Kashmir, 9 11 the April, 2001.
- Kim, S. And Kim, S.K. (1997). Canine demodicosis-a ten year retrospective study. *Korean J.of Vet. Cl.Med.* **14**(1):136-139.
- Kirtikar, K.R. and Basu, B.D. (1996) Indian Medicinal Plants 2nd edition, International Book Distributors, Dehradun.
- Mukhopadhyay, N. (1999). Studies on demodicosis and scabies in canine and their therapy. Thesis submitted to W.B.U.A.F.Sc for the Degree of M.V.Sc., Kolkata, West Bengal.
- Muller G.H.; Krik, R.W. and Scott, D.W. (1989). Cutaneous parasitology. In:small Animal Dermatology. W.B. Saunders Co. Philadephial pp.137-142.
- Nesbitt, G.H. (1983). Canine and Feline Dermatology. A systemic Approach. Lea and Febiger, Philadelphia.
- Reddy, N.R.J. and Rao, P.M. and Yathiraj, S, (1992). Serum protein profiles and their significance in canine demodicosis. *Indian Vet. J.*, **69**(8):762-764.
- Roy, S., Ghosh, R.C. and Misra, O.P. (1991) Therapeutic evaluation of ivermectin against demodectic mange infestation in dogs. *I.J.A.H.*, **30**:131-135.
- Roy, S; Maiti, S.K. and Ali, S.L. (1996) Therapeutic evaluation of herbal ectoparasiticides against canine demod-icosis. *Indian Vt. J.* **73**:871-873.
- Sarkar, P. (2002). Studies on therapeutic aspects of generalised demodex complex in canine. Thesis submitted to W.B.U.A. F.S. for the degree of M.V.Sc.
- Schwartzman, R.M. and Orkin, R.M. (1962) A comparative study of skin disease of dogs and man. Charles Thomas Pub., U.S.A.
- Scott, D.W., Farrow, B.R.H. and Schultz, R.D. (1974). Studies on the therapeutic and immunologic aspects of generalised demodectic mange in the dog. *J.Am. Anim. Hosp. Assoc.*, **10**:233.
- Sharma, N. And paul, S. (2002) Clinical efficacy of herbal drugs against various skin ailments in dogs. *Ind. Vet. Med. Jour.* Vol. **26**:67-68.
- Soclam, G.; Hritcu, L.; Beschea, S., Iacob, O.; Gheorghiu, C.; Gugnianu, E. and Mitrea, I.L. (1997). Comparison of the results of different treatment programmes for demodectic mange in dogs. *Revista-Romana-de-medicinia Veterinaria.* **7**:97-101.
- Toman, M.; Saroboda, M.;Rybnicek, J.;Krejei, J.;Faldyna, M. And Barto, O.(1997). Immunosuppr-ession in dogs with pyoderma and/or demodicosis. *Veterinary Medicina.*, **42**(10):299-306.

@#\$\$@#\$\$@#\$\$@