

A NOTE ON MANAGEMENT OF SARCOPTIC MANGE IN DOGS

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SUMMARY

A total of 24 dogs infected with sarcoptic mange were divided into 4 equal groups. Two groups were given ivermectin orally and subcutaneously while two groups received above treatment with supportive therapy of vitamin E, C and selenium and examined on days 0, 7, 14 and 21 post-treatment. The clinical recovery and improvement in haematological parameters was fastest in dogs which received ivermectin subcutaneously with supportive therapy and it was slow in dogs which received ivermectin alone orally.

Key words: Antioxidants, dogs, ivermectin, sarcoptic mange

Sarcoptic mange is clinically manifested by intense pruritus, papulae, alopecia and crusting and managed through chemical medication. The present paper evaluates efficacy of ivermectin given subcutaneously (s/c) and orally alone and in combination with supportive therapy.

Deep skin scrapings from the active lesions from dogs reported at Veterinary Clinic, Hisar and showing itching, alopecia, irritability, inappetance, erythema, keratinization etc. were collected. The lesions were graded as severe, moderate, mild and very mild. Total 24 dogs suffering from sarcoptic mange were divided into 4 equal groups. The dogs of group 1 and 2 received ivermectin @ 200 µg/kg body weight orally and s/c, respectively on day 0 and 14. The dogs of group 3 and 4 received selenium @ 0.05 mg/kg body weight i/m and vitamin E @ 2 mg/kg body weight on day zero and vitamin C @ 25 mg/kg body weight once daily for 14 days in addition to ivermectin orally and s/c, respectively. All the dogs were examined on day 0, 7, 14 and 21 for clinical recovery. Blood samples were collected at 0, 14 and 21 days in EDTA vials to record Hb, TLC, DLC and PCV by standard methods. The haematological indices of sarcoptic mange affected dogs were analyzed by standard statistical techniques (Snedecor and Cochran, 1994).

The shape, size and location of skin lesions varied

from dog to dog. Diffused shape of lesions reflected the generalized nature of sarcoptic mange. Most of the skin lesions were large (51.61%) followed by small (32.26%) and medium sized (16.13%). These lesions were multiple in numbers in all affected dogs. Sarcoptic mange was found more on ears and tail (88%) followed by head and face (62.5% each) and lumbar, sacral and periorbital area (50% each). Lesions on similar sites have been reported by Jani *et al.* (2004). The preferential location of the lesions might be due to thin stratum corneum, comparatively sparse hair, high humidity and protection from grooming that make these areas prone to the infestation (Rai and Yathiraj, 1988).

Thus, the main clinical symptoms in dogs affected with sarcoptic mange were itching (evident by scratching by the animal), alopecia and irritability in cent per cent of the cases. Inappetance was observed in severely and moderately affected cases and erythema was present in most of cases. Keratinization was observed in almost half of the affected dogs. The proportion of dogs exhibiting these symptoms was different as reported by other workers (Rai and Yathiraj, 1988, Jani *et al.*, 2004). Symptom of itching was the hallmark of scabies. It might be due to deep invasion of mites into the deeper parts of the stratum corneum as well as on account of liberation of proteolytic enzyme from damaged cells. Alopecia resulted due to disruption of hair follicle by mites. Erythema was characteristic of inflammation due to self inflicted pruritic trauma while

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keratinization (scaling) characteristics of scabies were the result of increased keratin production by damaged dermis (Rai and Yathiraj, 1988).

It has been revealed that antioxidant, immunopotentiating and physiological properties of Vitamin C, Vitamin E and selenium may help in the repair of damaged skin and in normalizing the biological functions disturbed by the mite. It is already on record that during the course of sarcoptic mange, there is deficiency of Vitamin E (Ferreira *et al.*, 1987). Ivermectin administered subcutaneously was found more effective in comparison to orally given ivermectin. There are several reports showing very high efficacy of ivermectin given subcutaneously in many dogs (Schedit *et al.*, 1984).

In the present study, ivermectin alone led to slow recovery as compared to ivermectin given in conjunction with Vitamin E, C and selenium. Although, ivermectin was able to contain sarcoptic mange but rate of recovery was slow. The supportive therapy enhanced the recovery rate drastically. Not only the clinical symptoms subsided faster because of supportive therapy, the general appearance and behaviour of recovered dogs returned to normal at a quicker rate. Ferreira *et al.* (1985) reported that dogs with scabies presented deficiency of Vitamin E as well as Vitamin A. Therefore,

it is possible that deficiency of Vitamin E contributes deleterious effects like skin denudation of the head and legs accompanied by pale, wrinkled cold skin on abdomen and feet. Hence, Vitamin E and Vitamin A have important functions in protecting the skin. Vitamin C, Vitamin E and selenium are known to be important in normal functioning of immune cells and their deficiency hinders the cell mediated immunity. The positive effect on the rate of recovery in sarcoptic mange in the present study might have been due to antioxidant and immunopotentiating effect of these three substances. Dimri and Sharma (2004) also recommended that ascorbic acid should be used as adjunct therapy since it had further enhanced recovery when used with herbal preparation.

The haematological indices of dogs infested with sarcoptic mange were recorded to assess the effect of specific and supportive therapy. The data revealed a significant decrease in haemoglobin, packed cell volume, leucocytosis and eosinophilia in sarcoptic mange affected dogs (Table). Similar type of haematological changes has been observed earlier by Dadhich and Khanna (2008). There was significant increase in Hb, PCV and TLC on days 14th and 21st post treatment. The maximum improvement was observed in group 4 followed by group 3 and 2. The least restoration of

Table

Haematological changes in dogs affected with sarcoptic mange before and after treatment

Parameter	Group	Days of observation		
		0	14	21
Hb (g/dl)	1	9.08±0.42 ^b	9.83±0.25 ^b	10.17±0.17 ^a
	2	9.67±0.79 ^a	10.58±0.44 ^a	11.00±0.39 ^a
	3	9.83±0.54 ^b	10.92±0.27 ^b	11.58±0.20 ^a
	4	10.08±0.52 ^b	11.17±0.25 ^b	12.08±0.15 ^a
PCV (%)	1	28.13±1.53 ^b	29.83±0.80 ^b	31.10±0.59 ^b
	2	29.30±2.30 ^b	32.20±1.23 ^b	33.43±1.13 ^b
	3	29.67±1.61 ^b	33.03±0.79 ^{ab}	34.90±0.77 ^a
	4	30.53±1.56 ^b	33.83±0.69 ^b	36.80±0.44 ^a
TLC (x103/ml)	1	13.25±0.21 ^c	12.33±0.21 ^b	11.67±0.17 ^a
	2	12.83±0.59 ^b	11.50±0.37 ^{ab}	10.83±0.17 ^a
	3	12.58±0.20 ^b	12.00±0.26 ^{ab}	11.58±0.15 ^a
	4	12.83±0.11 ^c	11.42±0.15 ^b	10.58±0.08 ^a
Eosinophil (%)	1	6.17±0.83 ^b	5.00±0.68 ^{ab}	4.00±0.6 ^a
	2	5.67±0.61 ^b	5.00±0.82 ^b	3.00±0.26 ^a
	3	7.33±1.24 ^c	4.50±0.43 ^b	3.33±0.00 ^a
	4	6.67±0.71 ^c	3.67±0.33 ^b	2.33±0.21 ^a

Means in a row having different superscripts differ significantly (P≤0.05)

normal haematological values was observed in group 1. Decrease in Hb could be attributed to the chronicity and generalized nature of disease (Ferreira *et al.*, 1987). It might also be due to significantly low erythrocytic count, haematocrit and erythrocyte fragility and lowered production of erythropoietin due to toxemia caused by mite (Jain, 1986). Leucocytosis might be due to allergic reaction caused by mites or their products of inflammatory reaction (Jain, 1986, Shah, 1994). On DLC estimation, it was observed that there were no marked changes in the per cent neutrophils, lymphocytes, basophils and monocytes count. However, raised per cent eosinophils were observed in affected dogs, eosinophil count decreased as the disease severity decreased as shown in Table. Eosinophils significantly reduced on days 14th and 21st. The maximum reduction was observed in group 4 and 2 followed by group 3 and 1. Eosinophilia might be due to specific sensitization reaction to the parasitic proteins and the consequential inflammatory response of the body.

In the present study, the rate of return to normal haematological values was faster and more pronounced in affected dogs given supportive therapy along with ivermectin. The function of Vitamin E in maintaining erythrocytic membrane could help the affected dogs in reducing the erythrocyte destruction. Deficiency of Vitamin E and Vitamin C is known to cause suppression of cell mediated immunity. Thus, supplementation with these Vitamins will restore the effectiveness of immune system and thus help in recovery from the infection. Moreover, antioxidant properties of Vitamin E, C and selenium reduce the free radical mediated oxidative damage to erythrocytes and skin cells membrane. The combined effect of these three substances might have

led to faster and better recovery from sarcoptic mange induced clinical syndrome.

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