



RESEARCH ARTICLE

THERAPEUTIC MANAGEMENT OF SCABIES IN A CAPTIVE CAMEL (*CAMELUS DROMEDARIES*)

*Assistant Professor Dr. Arul, V.

Department of Veterinary Science and Animal Husbandry, Adhiparasakthi Agricultural and Horticultural College, Kalavai, Vellore, Tamil Nadu, India- 632506

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ABSTRACT

Two adult camels (one male and female each) weighing about 450-500 kg body weight reared under captive conditions at Adhiparasakthi Agricultural and Horticulture College farm, kalavai, Vellore district had anorexia, debility, alopecia, intense prurities and was not amenable to antibiotic therapy. Clinically camels were weak, emaciated and had itching, prurities, biting and rubbing against objects and were totally restless and secondary bacterial infection were also noticed. The lesions were scattered throughout the entire surface of the body with involvement of head, face, neck, brisket region, thighs, inguinal region, perineal region and root of the tail etc., Keratinisation, thickening, corrugation and wrinkling of the skin, exudation, bleeding, fissured skin and scab formation were also noticed. The cause for skin lesion was diagnosed as *Sarcoptes scabiei* var. *cameli*. By skin scrapping .The camel was treated with ivermectin at the dose rate of 200 microgram per kg body weight in combination with antibiotic, multivitamins and mineral supplements for a period of time and during the course of treatment the camel was provided with medicated bath. Finally the treatment resolved the case successfully.

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INTRODUCTION

Camels plays many significant roles in social and economic development of people in numerous countries. Camels are now valuable chiefly for the products they yield. Camel meat and milk are important foods in Asia and North Africa. Camel hide is used to make sandals, jugs, and other containers, while the hair is used in rugs, tents, and clothing. The dried bones are often used in decorative art as a substitute for ivory, and the dung is used as fuel. The camel has been considered an aid to man for thousands of years in many different respects by providing meat, milk, leather, fibre, fuel, transportation (packing, riding) and racing (Solanki *et al.*, 2013). Camels are also used for draft purposes, pulling ploughs and wagons (Fowler *et al.*, 2006). Pathogenic diseases, poor nutrition and traditional management systems have restricted their full utilization. Despite being usually reared under harsh environment, unsuitable for propagation and transmission, camels are capable of harbouring a fairly large variety of parasites. Sarcoptic mange is more common in camels and is of zoonotic importance. Sarcoptic mange in camels is caused by *Sarcoptes scabiei* var *cameli* is considered to be one of the

most serious, contagious, zoonotic (Singh and Veer, 2005) and debilitating disease affecting both dromedary (Arabian and Bactrian camels) and llamas (Higgins,1983). Ivermectin has been reported to be effective against ectoparasites of domesticated animals including camel following parenteral administration (Hassan *et al.*, 1989 and Makkar *et al.*, 1991). This paper deals successful treatment of sarcoptic mange in camels under captive conditions using Ivermectin along with multivitamins, mineral supplements and antibiotics.

Case History and Observations

Two adult camels (shown in Fig. 1) (one male and female each) weighing about 450-500 kg body weight reared under captive conditions at Adhiparasakthi Agricultural and Horticultural college, kalavai, vellore district reported with anorexia, debility, alopecia, intense prurities and was not amenable to antibiotic therapy. Clinically camels were weak, emaciated and had itching, pruritus, biting and rubbing against objects shown in (Fig. 2) and were totally restless. The lesions were scattered throughout the entire surface of the body with involvement of head, face, neck brisket region, thighs, inguinal region, perineal region and root of the tail etc., Keratinisation, thickening, corrugation& wrinkling of the skin shown in (Fig. 3), exudation, and bleeding, fissured skin & scab

*Corresponding author: Dr. Arul, V.

Department of Veterinary Science and Animal Husbandry, Adhiparasakthi Agricultural and Horticultural College, Kalavai, Vellore, Tamil Nadu, India-632506.

Table 1. Haematological Parameters of camels affected with scabies

Parameters	Pre Treatment	Value	Post Treatment Value	Normal Range	
				Male	Female
PCV %	19.5	27	24-35	24-50	
Hb g/dL	11.5	13.5	8.0-16.0	8-17	
RBC 10 ⁶ /μL	4.5	8.5	6.0-9.2	4.25-12.9	
WBC 10 ³ /μL	20.1	14	11-16	4.2-20	
Lymphocytes %	56	39	41	43	
Monocytes %	3	3	4	1-4	
Neutrophils %	65	42	50	41-65	
Eosinophils %	7	3	3	3-9	
MCV fL	22	37	36-55	17.4-62.6	
MCH pg	12	19	16-22	13.4-28.0	
MCHC g/dL	19	29	26-50	29.6-64.7	

Table 2. Biochemical Parameters of camels affected with camel

Parameters	Pre Treatment Value	Post Treatment Value	Normal Range
Total Protein g/dL	4.5	6.9	6.3-8.8
Albumin g/dL	2.5	4.7	3.0-4.4
AST IU/ML	47	30.1	105
ALT IU/ML	32	13.6	15
BUN mmol/L	6.2	5.0	6.0

**Fig. 1. Female and Male camel affected with scabies**

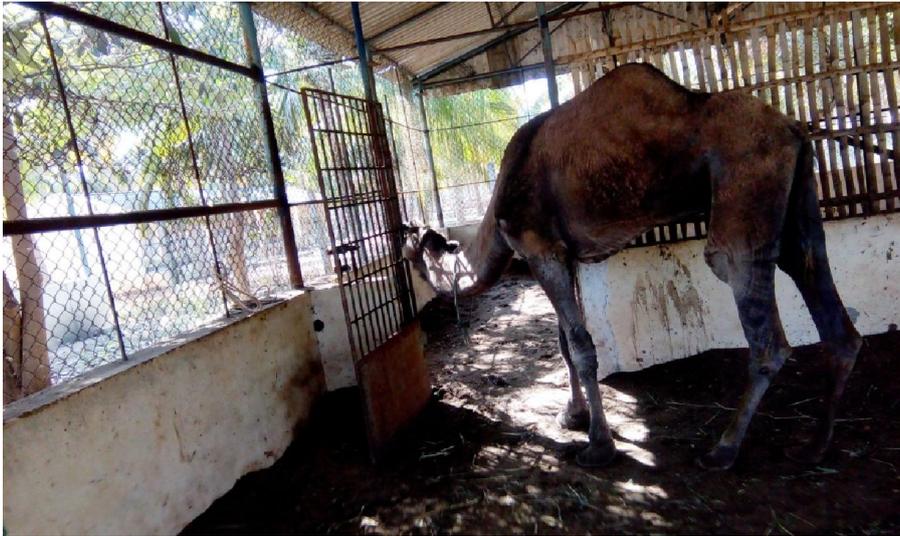


Fig. 2. The camel affected with scabies rubbing its face against hard object



Fig. 3. Fissured skin and bleeding noticed above the eyes of scabies affected camel

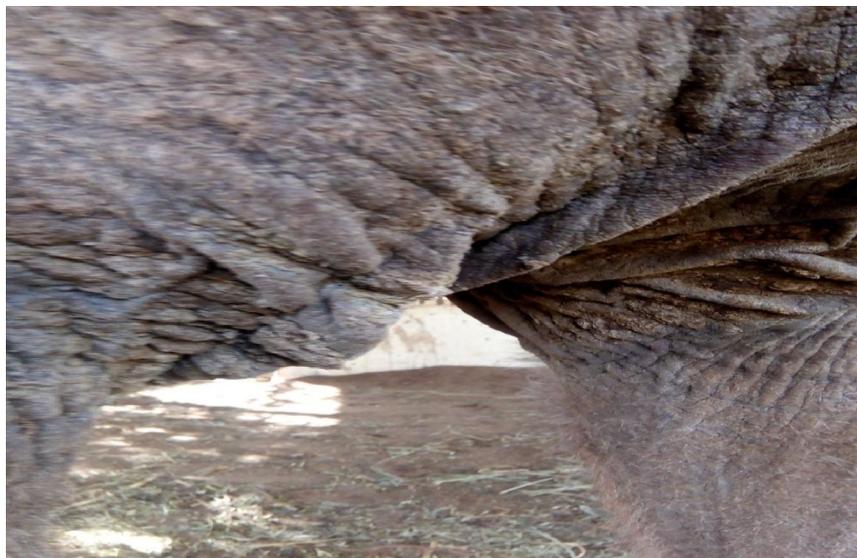


Fig. 4. Keratinization and corrugation noticed in the skin of camel



Fig. 5. Crust and scab formation noticed in the udder region of the affected camel

formation shown in (Fig. 4) were also noticed and in female scab formation also noticed in the udder and teats region shown in (Fig. 5) Upon physical examination finding revealed that Alopecia, erythema, numerous small vesicles and secondary bacterial infection also noticed. Deep skin scrapings until bleeding (about 10% of the total area) of any skin lesions at periphery were taken from each animal, processed with 10% KOH solution and were examined as per routine parasitological procedures. *Sarcoptes scabiei var cameli* mites were identified on the basis of their characteristic morphological features (Georg, 1985). Blood samples were collected from jugular vein in vacutainers containing EDTA for haemogram and without EDTA for biochemical assay.

Diagnosis

Sarcoptes scabiei var cameli mites were identified on the basis of their morphological characteristic features such as circular outline having four pairs of short and stumpy legs. The third and fourth pair of legs do not project beyond the body margins (Georgi, 1985; Nayel and Abu-Samra, 1986; Arora, 2003) The PCV, hemoglobin and RBC were lower than the normal range indicative of anemia (Table 1), The granulocytes (neutrophils, eosinophils and basophils) and agranulocytes (lymphocytes and monocytes) were higher than normal indicative of secondary bacterial infections. and the increase in the value of AST, ALT and urea observed were supported by findings of Gorak Mal *et al.* (2006) in camels infested with mange (Table 2).

Treatment

Based on the clinical examination and hematological and biochemical parameters the camel was treated with Ivermectin administered at the dose rate of 200 µg per kg body weight by subcutaneous route at the base of the neck at fortnightly intervals until sixty days of infestation along with parenteral administration of antibiotics (Enrofloxacin at the dose rate of 10mg per kg body weight) and 10 ml of E care Se

injections for eight weeks. Benzyl benzoate suspension was applied topically for the first week and it was followed by tetrasol soap bath sprays and oral administration of Mineral mixture (Nutricell at the rate of 40mg per day). The camels were clinically examined to assess the efficacy of Ivermectin based treatment. The living mite count was severe on first week, moderate on fourth week, mild on sixth week and was totally zero on eighth week of drug administration. Usage of Ivermectin for treatment of Sarcoptic mange at a dose rate of 200 µg / kg body weight against Scabies in camels was reported by Singh *et al.* (2001). Haematobiochemical profile revealed a decrease in haemoglobin, total erythrocyte count, packed cell volume and lowered value of total proteins and albumin simulating to findings already recorded by Parmar *et al.* (2005). An increase in total leukocyte count, eosinophils, lymphocytes, AST, ALT and urea observed were supported by findings of Gorak Mal *et al.* (2006) in camels infested with mange (Table 2). The post treatment haematological (Table 1) and biochemical values (Table 2) were within the normal range.

DISCUSSION

Clinical findings such as alopecia, erythema, vesicle formation, pruritis and thickening of skin are in accordance with findings of Fowler (1986) who stated that the burrowing mite caused hyperemia, thickening of skin, loss of vitality of skin, papule and pustule formation, which later became encrusted. The lesions in this case were found scattered throughout the body. This was in accordance with Fowler (2010) who quoted that, the lesions were commonly found on the limbs but in severe cases, the entire body gets affected. Similarly, Wallach and Boever (1983) reported that clinical cases of sarcoptes were pruritis, with associated alopecia and seborrhea especially of the head and neck. Usage of Ivermectin for treatment of Sarcoptic mange at a dose rate of 200 µg per kg body weight against Scabies in the camel was done based on the reports given by Singh *et al.* (2001) and Fowler (2010). Oral administration of vitamin and mineral supplements was done

based on the report given by Fassi-Fehri (1987) who stated that malnutrition and nutritional deficiency (particularly vitamin A deficiency) favoured development of sarcoptic mange. Therapeutic effect was observed, which revealed a marked clinical improvement with regard to healing of the skin lesions, improvement of skin texture and appearance. Also, there was improvement in appetite and the animal was relieved from scratching.

Conclusion

The effects of therapy on skin as observed in these camels, marked clinical improvement in appearance with reference to skin texture, healing of skin lesions (i.e.) disappear wrinkling, falling of scabs, skin folds becoming less and subsequent appearance of fresh shiny skin with glossy hair 1-3 mm long prior to second treatment absence of tissue swelling because of injections, disappearance of clinical signs of itching with parasitological cure noticed by eighth week was supported by Makkar *et al.* (1991), Parmar and Veer Singh (2005) and Reis offerman (1985). Disappearance of crusts, secondary bacterial infection was effectively controlled by using antibiotics injection. Clinical recovery was apparent in all the treated camels. This proved Ivermectin along with antibiotics, mineral supplement and hygienic management of farm premises. Was 100% efficient in therapeutic management of scabies in captive camels.

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