

CLINICAL MANAGEMENT OF SARCOPTIC MANGE IN DROMEDARY CAMELS REARED UNDER HIGH ALTITUDE COLD DESERT

Achin Arora¹, Vijay K. Bharti¹, Rakesh Ranjan² and SS Balaje¹

¹DRDO-Defence Institute of High Altitude Research (DIHAR), Leh, Ladakh UT-194101, India

²ICAR-National Research Centre on Camel, Bikaner, Rajasthan- 334001, India

ABSTRACT

A total of four adult dromedary camels (2 male and 2 female) inducted at DRDO-Defence Institute of High Altitude Research (DIHAR), Leh were reported with anamnesis of reduced appetite, frequent itching and development of skin lesions. The animals were kept in open and stall fed under high altitude cold desert conditions. Physical examination revealed development of diffused skin lesions like alopecia, numerous small vesicles, erythema and abrasions. Though lesions were diffused, they were more prominent in certain areas like head, neck, inguinal region and brisket. Skin scraping examination revealed presence of *Sarcoptes scabiei* var. *cameli* mite in abundance. The affected animals cured successfully using ivermectin and multivitamin injections and topical application of seabuckthorn (*Hippophae rhamnoides*) pulp, Himax and melathion 0.2% in petroleum jelly base.

Key words: Camel, High-altitude, Sarcoptic-mange, Scabies

Dromedary camel (*Camelus dromedarius*) is largely distributed in arid and semi-arid regions across the world. These are used as pack animals in harsh and hostile terrain of Ladakh, a high altitude region of India, where movement of mechanical transport is not easy, so local people and armed forces use them to carry their load and luggage (Lamo *et al*, 2020). These camels get gradually acclimatised to the prevailing climatic conditions under high altitude cold desert.

Highly pruritic and contagious dermatitis, caused by the mite *Sarcoptes scabiei* var *cameli*, can lead to dramatic decline in health and productivity of diseased animal and may even result into death of the affected animal if no treatment is given (Driot *et al*, 2011). The present report describes successful management of sarcoptic mange in dromedary camel that developed one month after their induction to high-altitude cold desert conditions. The disease responded well to the treatment comprising subcutaneous administration of ivermectin in combination with topical application of Himax cream seabuckthorn pulp and melathion in petroleum jelly base.

Materials and Methods

Animal details and clinical observations

Four apparently healthy dromedary camels (2 male and female, each), aged 2-3 years were brought

from plain low-altitude (Bikaner, Rajasthan, India) to high-altitude Ladakh (11500 msl), India. Ambient temperature and humidity of study period during June-August (summer months) were 8-26°C and 30-45% RH. Body condition of all four animals were good and after a month of arrival at Leh, all the camels gradually developed symptoms of pruritis, thickening of skin that were more evident in the head, groin, neck, inguinal and brisket region. There was no lesion on the hump region. The lesions were accompanied with alopecia, numerous small vesicles, arrhythmia, and white to grey heavy crusts (Fig 1). The affected camels were slightly anorectic, restless and showed itching and rubbed skin against the wall and iron pole of the shed.

Sample collection

Body weight of affected animals were recorded once at onset of symptoms and thereafter on monthly basis till recovery. Deep skin scrapings were taken from the periphery of skin lesions until bleeding started (Soulsby, 1982). Collected scrapings were transferred to 10% potassium hydroxide solution kept in sterile glass vials and fitted with screw cap. The samples collected were heated till the mixture became homogenised. After cooling the mixture was centrifuged at 1500 RPM/min for 5 minutes. The

SEND REPRINT REQUEST TO VIJAY K. BHARTI [email: vijaykbharti@rediffmail.com](mailto:vijaykbharti@rediffmail.com)



Fig 1. Male dromedary camel with sarcoptic mange infestation (Red colour round marked is affected neck, brisket region, frontal face).

supernatant fluid was discarded and the sediment was put over a glass slide and examined under microscope. Blood samples were also collected using vacutainers containing EDTA and various haematological parameters were estimated using Auto-Blood Analyser.

Diagnosis and Treatment

Microscopic examinations of skin scrapings revealed that all the four camels were infested with *Sarcoptes scabiei* var *cameli* mites. The mites were identified on the basis of the characteristic morphological features viz. circular outline with four pairs of short and stumpy legs (Fig 2), the third and fourth pair of legs did not project beyond the body margins (Georgi, 1985; Nayel and Abu-Samra, 1986; Arora, 2003). The PCV, haemoglobin and RBC were within the normal range in all camels, but in one male camel, there was marked eosinophilia and neutropaenia, an indication of an allergic reaction due parasite infestation (Table 1).

All the infected camels were administered with the ivermectin (200µg/kg b. wt. s/c) at an interval of 15 days for about a 3 months period. Apart from this, as soon as the symptoms developed, topical application of a mixture containing Seabuckthorn pulp, Himax cream* Malathion (0.2%) in petroleum jelly once daily was continued for one month. The camels were also fed a routine diet along with Biovet -YC** @ 20 gm in meals once daily for 3 months and

intramuscular multivitamin injections on alternate day for 15 days.

Table 1. Haematological parameters of camels affected with sarcoptic mange at high altitude.

Parameters	Animal and sex			
	J-78 (Male)	J-404 (Male)	J-79 (Female)	J-299 (Female)
Hb (gm %)	13.2	15.7	14.0	12.8
Erythrocytes count (million/mm ³)	7.03	7.23	7.12	6.98
Leokocytes count (no./µl)	8000	15200	14000	11100
PCV (%)	30.20	30.60	31.30	32.40
Neutrophils (%)	28.0	67.0	70.0	68.0
Eosinophils (%)	17.0	4.0	7.0	9.0
Basophils (%)	0.0	0.0	0.0	0.0
Monocyte (%)	10.0	2.0	2.0	3.0
Lymphocytes (%)	45.0	27.0	21.0	20.0

Results and Discussion

All the treated animals showed clinical recovery after 3 months period (Fig 3). Dromedary camels are frequently infested with Sarcoptic mange mites. The clinical disease is characterised by alopecia, pruritis, thickening of skin, erythma and crust formation (Fowler, 1998). Dromedary camels included in the present report were inducted to high altitude cold desert conditions a month ago. The affected animals

* HIMAX Manufactured by Natural Remedies Pvt Ltd, Ayurvedic ointment.

** Manufactured by Vetoquinol, Composition-Saccharomyces, Lactobacillus, Propionibacterium freudenreichii, Seaweed Powder.



Fig 2. Sarcoptic mange mite -*Sarcoptes scabiei* var *cameli*.

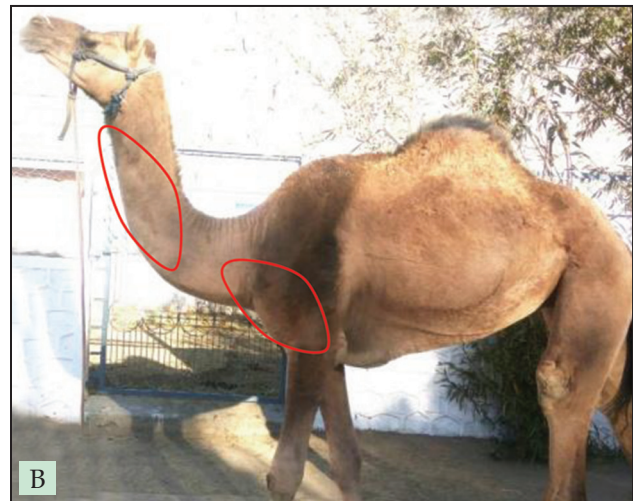


Fig 3. Recovery from Sarcoptic mange after the treatment, A. Red colour round marked showing topical application of medicine, B. Red color round marked is recovered neck, brisket region in male camel at high altitude.

also revealed alopecia, thickening of skin, pruritis alongwith with vesicle formation and erythematic reaction in the vicinity of the lesion which further caused loss of vitality of skin and crust formation. The lesions were found scattered throughout the body, especially in the head, neck, inguinal region, limbs, and the brisket region (Fowler, 2010; Ahmed *et al*, 2020). Treatment with ivermectin for sarcoptic mange (@ 200 µg per kg b.wt) against scabies in the camel was done based on the reports given by Singh *et al* (2001) and Fowler (2010). Multivitamin supplements were also administered as malnutrition and nutritional deficiency (particularly vitamin A deficiency) is reported to predispose the animal for sarcoptic mange infestation (Fassi-Fehri, 1987). As per Zielinska and Nowak (2017), the fruits of seabuckthorn contain flavonoids, catechins and procyanidins, cyclitols, phospholipids, tannins, sugars: galactose, fructose, xylose, and approximately

3.9% organic acids (maleic acid, oxalic acid, malic acid, tartaric acid), phenolic acids, e.g. ferulic acid as well as fatty oil that have a potential anti-allergic action. The leaf extract of seabuckthorn plant has been found reported to have anti-influenza and anti-cancer activities (Enkhtaivan *et al*, 2017). Thus topical application of its fruit pulp appeared to help early recovery from mange in dromedary camels. The therapeutic effect was supported by improvement in skin texture, subsided skin lesion, new hair follicular growth and improved body condition.

Conclusions

A treatment with parenteral administration of ivermectin of along with topical application of a

mixture containing seabuckthorn pulp, Himax cream, 0.2% Malathion in petroleum jelly base was found effective and therefore can be recommended for the treatment of Sarcoptic mange in camel under high altitude conditions.

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