The epidemiology and control of camel dermatophilosis

C.G. Gitao [1]

GITAO (C.G.). La dermatophilose cameline : épidemiologie et lutte. *Revue Elev. Méd. vét. Pays trop.*, 1993, **46** (1-2) : 309-311

La dermatophilose du chameau n'a été décrite que récemment. Elle semble néanmoins plus répandue qu'on ne le croyait. Au Kenya, elle a été trouvée en général dans les régions semi-arides d'élevage du chameau dans les districts de Samburu et de Laikipia, mais n'a pas encore été mise en évidence dans les régions arides du district de Turkana. Lors d'une prospection de tiques sur 200 chameaux, aucune tique *Amblyomma variegatum* n'a été trouvée bien que de nombreuses autres tiques étaient présentes. On soupçonne *A.variegatum* de transmettre la dermatophilose à plusieurs animaux domestiques. La seule méthode de lutte contre la dermatophilose au Kenya est actuellement appliquée dans une ferme commerciale, où les chameaux sont régulièrement lavés avec une solution d'alun potassique à 1 p. 100. Les chameaux ont montré une amélioration progressive. Récemment, environ 50 chameaux importés du Pakistan ont été affectés par une infection cutanée sévère, très similaire à la dermatophilose. Tous les chameaux importés adultes ont été atteints, mais non les veaux. Etant donné qu'on n'a pas pu isoler de bactéries de ces chameaux, on pense que l'affection a été causée par une déficience en vitamine.

Mots clés : Dromadaire - Dermatophilose - *Dermatophilus congolensis* - Epidémiologie - Tique - *Amblyomma variegatum* - Kenya.

INTRODUCTION

Camels are reared in the arid and semi-arid areas of Kenya which constitute eighty per cent of the total land surface and where pastoralists derive their livelihood. The camels are particularly valuable as they survive and even thrive during the dry season while other animals die in great numbers (2). Camel dermatophilosis is a skin disease of camels recently described in one commercial farm, the Ol Maisor farm in Laikipia District in the semi-arid areas of Kenya (4).

Dermatophilosis in the bovine is described to be more prevalent in free-ranging animals rather than in well managed herds (7, 11). Bovine dermatophilosis has also been strongly associated with the tropical bont tick, *Amblyomma variegatum* (3, 8). A similar relationship has been described for goats with a severe skin infection (9). Attempts at control of dermatophilosis have been performed by dipping of cows in acaricide (8) or dusting of sheep with aluminium potassium sulphate (5).

In this study therefore, the possibility of camel dermatophilosis being present and probably more prevalent in the free-ranging camels in the semi-arid areas was examined. The presence and distribution of ticks on 200 camels in the free-ranging camels was compared to similar camels at the Ol Maisor farm. Some very severe skin lesions which developed on camels imported from Pakistan to the Ol Maisor farm were examined and the control method practised at the farm against camel dermatophilosis was studied.

MATERIALS AND METHODS

Two hundred camels kept by pastoralists in herds ranging from 5-15 camels per herd were examined. These camels are reared freely in the Samburu district which is semi arid receiving about 500 mm of rainfall annually. A similar examination of 200 camels at the Ol Maisor farm was performed. From the Pakistan camels, 30 samples were obtained from the sick camels. Skin scabs were obtained from suspicious skin lesions and processed as described before (4) and then examined for the presence of *Dermatophilus congolensis.*

Ticks were obtained from the two hundred camels reared by pastoralists and from the two hundred camels in the commercial farm. This was performed in March in the rainy season and repeated in August in the dry season. The site of attachment was noted and the ticks identified as described by Hoogstraal (6).

The application of 1 % potassium aluminium sulphate was assessed after a period of six months on eight camels which were severely affected. Four camels which were not treated were used as controls. Four sites on each camel were marked and their diameter in size and wool regeneration followed monthly.

RESULTS

Dermatophilosis was found in three pastoral households affecting twenty seven camels. Camels of different age groups were affected and the degree of skin involvement

1. University of Nairobi, Department of Veterinary Pathology and Microbiology, P.O.Box 29053, Nairobi, Kenya.

TABLE I Percentage tick distribution in the commercial and pastoral herds.

Tick	Pastoral		Commercial	
	March	Aug.	March	Aug.
H. dromedarii	20.8[a]	36.2	0	10.7
	16.6[b]	8.6	0	2.2
	9.4[c]	1.8	0	0
H. rufipes	24.6	32.1	3.7	9.8
	22.4	16.2	9.3	7.3
	4.3	2.0	2.6	4.5
H. truncatum	0.6	1.0	0	6.8
	0.5	0.2	0	3.8
	0	0	0	0.4
R. pulchellus	0.8	1.0	20.3	18.5
	0	0.9	18.7	11.2
			2.3	3.0
			8.6[d]	18.1
A. gemma			15.4	2.0
			15.6	1.2
			3.5	0.5
Total in sample	1604	1 518	1 050	870

[a] *males ;* [b] *females ;* [c] *engorged females ;* [d] *nymphs.*

TABLE II Attachment sites of tick species on camels in the commercial barm.

Site	No.	Tick species	% of total
Nose	110	*H. dromedarii*	70.3
		R. pulchellus	26.8
		A. gemma	2.9
Ear	17	*H. dromedarii*	92.8
		R. pulchellus	7.2
Inguinal area	50	*R. pulchellus*	44.8
		A. gemma	26.2
		H. rufipes	16.8
		H. truncatum	12.2
Fore Legs	54	*R. pulchellus*	72.4
		H. truncatum	15.3
		H. dromedarii	9.8
		A. gemma	2.5

ranged from 20 to 60 %. The most seriously affected sites were the flanks and the neck. At the Ol Maisor farm, 15 camels were affected by dermatophilosis with the degree of skin involvement varying from 10 % mostly in the adults to 60 % mostly in the calves. Similar sites of skin involvement were found as in the pastoral herds. *Dermatophilus congolensis* was not isolated from the Pakistan camels.

The predominant tick species in the commercial herd was *Rhipicephalus pulchellus* while in the pastoral herd, *Hyalomma dromedarii* and *Hyalomma rufipes* were the most important. The tick distribution on the different herds is shown on table I and the tick preference site on table II. No *Amblyomma variegatum* ticks were found on any of the camels. The tick load in both herds was higher in the rainy season than in the dry season.

There was a significant decrease in the size of lesions of the treated camels ($p<0.05$) and evidence of wool regrowth which was not evident on the untreated camels.

DISCUSSION

Camel dermatophilosis was found on animals reared in pastoral herds and it is probably more frequent than in commercial herds but this would require a wider survey. One limitation is that there is only one commercial farm keeping camels in Kenya. On the commercial farm there is regular application of acaricide grease unlike on the pastoral herds which are left to roam free with little attention. This also explains the higher tick load on pastoral herds as compared to commercial herds.

RICHARD (10) records 11 species of tick which infest camels in Ethiopia. These include *Rhipicephalus pulchellus, Rhipicephalus simus, Rhipicephalus pravus, Amblyomma variegatum, Amblyomma gemma, Amblyomma lepidum, Hyalomma excavatum, Hyalomma truncatum, Hyalomma dromedarii, Hyalomma impeltatum* and *Hyalomma rufipes*. He considered that qualitatively, *Rhipicephalus pulchellus* and *Rhipicephalus simus* were the most important. CURASSON (1) considered *Hyalomma* spp. to be the dominant species in the camel. The most important tick species probably varies according to the habitat (12), with *Hyalomma* spp. being the most prevalent in arid areas. In this study, *Hyalomma dromedarii* and *Hyalomma rufipes* were predominant in the pastoral areas and *Rhipicephalus pulchellus* predominant in the commercial herd. No *Amblyomma variegatum* ticks were found. Although *Amblyomma variegatum* ticks have been found on camels (12), they are in such low frequencies (0-1.8 %) as to be of little epidemiological value in the spread of dermatophilosis. It may be that in the dromedary unlike in the bovine, other agents like Tabanid biting flies are involved in the spread of dermatophilosis.

The severe skin lesions on the Pakistan camels were thought to be due to vitamin deficiency, since the calves which may have had enough maternal reserve were not involved.

The treatment of dermatophilosis in the camels with 1 % potassium aluminium sulphate was found to be effective. On sheep, similar treatment was found to be effective (5). The inhibitory effect of potassium aluminium sulphate is

said to be due to its ability to inhibit the motility of *D. congolensis* zoospores and so prevent re-invasion of the skin (5). Since extensive husbandry is the most practical method of camel husbandry, it is not possible to advocate improved management of camels and simple compounds which can be applied by pastoralists may be more suitable.

ACKNOWLEDGEMENTS

This work is funded by the International Foundation for Science.

REFERENCES

I. CURASSON (G.). Le chameau et ses maladies. Paris, Vigot Frères, 1947.

2. FAZIL (M.A.). The camel. *Bull. epizoot. Dis. Afr.*., 1977, **25** : 435-442.

3.GARRIS (G.I.), SCOTLAND (K.). Ticks on livestock in St.Lucia.*Vet. Parasitol.*, 1985, **18** (4) : 367-373.

4. GITAO (C.G.), EVANS (J.O.), ATKINS (D.J.). Natural *Dermatophilus congolensis* infection in camels (*Camelus dromedarius*) from Kenya. *J. Com . Path.*, 1990, **103** : 307-313 .

5. HART (C.B.), TYSZKIEWICZ (K.). Mycotic dermatitis in sheep. III. Chemotherapy with potassium aluminium sulphate . *Vet . Rec.*, 1968, **82** : 272-281.

6. HOOGSTRAAL (H.). African Ixodoidea. I. Ticks of the Sudan (with special reference to Equatoria Province and with preliminary reviews of the genera *Boophilus, Margaropus* and *Hyalomma*). Washington DC, USA, Dep. Navy Bur. Med. Sur., 1956.

7. KONEY (E.B.), MORROW (A.N.). Streptothricosis in cattle on the coastal plains of Ghana : A comparison of the disease in animals reared under two different management systems. *Trop. Anim. Health Prod.* ,1990, **22** (2) : 89-94.

8. LLYOD (D.H.). Dermatophilosis : A review of the epidemiology, diagnosis and control. *In* : Proceedings Cowdriosis and Dermatophilosis of Livestock in the Caribbean region, St John, Antigua, 12-14 Nov. 1990, CTA/CARDI. Pp. 99-111.

9. MARTINEZ (D.). Workshop on Dermatophilosis. *In* : VON TSCARNER (C.), HALLIWELL (R.E.W.). Advances in Veterinary Dermatology. Vol. 1. London, Bailliere Tindall, 1990. P. 410.

lO. RICHARD (D.). Study on the pathology of the dromedary in Borana Awraja (Ethiopia). Maisons-Alfort, IEMVT, 1979.

ll.SAMUI (K.L.), HUGH-JONES (M.E.). The epidemiology of bovine dermatophilosis in Zambia. *Vet. Res. Commun.* , 1990, **14** (4) : 267-278.

12. WILSON (A.J.), DOLAN (R.), OLAHU (M.). Important camel diseases in selected areas of Kenya. IPAL Technical report E6. Nairobi, UNESCO, 1981.

GITAO (C.G.). The epidemiology and control of camel dermatophilosis. *Revue d'Elev. Méd. vét. Pays trop.*, 1993, **46** (1-2) : 309-311

Camel dermatophilosis was only recently described. It appears however that it is more widespread than originally thought. In Kenya it has generally been found in the main semi-arid camel rearing areas of Samburu and Laikipia districts although it has not yet been found in the arid areas of Turkana district. In an investigation of ticks on 200 camels, no *Amblyomma variegatum* ticks were found although many other ticks were present. *A. variegatum* is suspected to transmit dermatophilosis in many domestic animals. The only control method of dermatophilosis currently practised in Kenya is in one commercial farm, where camels are regularly washed with a 1 % potassium aluminium sulphate solution. The camels have shown progressive improvement. Recently, some 50 camels imported from Pakistan in this farm came down with a severe skin infection which closely resembled dermatophilosis. All imported adult camels were involved although no calves were involved. Since no bacteria were isolated from all the sick camels, it was thought to be due to vitamin deficiency.

Key words : Dromedary - Dermatophilosis - *Dermatophilus congolensis* - Epidemiology - Tick - *Amblyomma variegatum* - Kenya.

GITAO (C.G.). Epidemiología y control de la dermatofilosis en el camello. *Revue d'Elev. Méd. vét. Pays trop.*, 1993, **46** (1-2) : 309-311

Aunque la descripción de la dermatofilosis en el camello se hizo recientemente, la distribución de esta enfermedad es más amplia de lo que se pensó inicialmente. En Kenia, se ha encontrado generalmente en Samburu y Laikipia, principales zonas semi-aridas de producción de camellos, pero aún no se ha aislado en las zonas áridas del distrito de Turkana. En un estudio de investigación sobre 200 camellos, se encontraron varios tipos de garrapatas, pero no *A. variegatum*. Se sospecha que esta variedad de garrapata actúa como vector de la dermatofilosis en varias especies animales. El único método de control contra la dermatofilosis utilizado actualmente en Kenia, practicado en una explotacion comercial, es el baño periódico de los camellos con una solución de potasio y sulfato de aluminio al 1 p.100. Se ha observado una mejora progresiva en los animales. Recientemente, 50 camellos importados de Pakistán por este establecimiento, presentaron un brote de una enfermedad cutánea, muy similar a la dermatofilosis. Todos los adultos importados sufrieron la enfermedad, pero no los animales jóvenes. Se diagnosticó una deficiencia vitamínica, debido a que ninguna bacteria fue aislada en los animales.

Palabras claves : Dromedario - Dermatofilosis - *Dermatophilus congolensis* - Epidemiología - Garrapata- *Amblyomma variegatum* - Kenia.