

Communication

Camel (*Camelus dromedarius*) contagious ecthyma in the Sudan. A case report

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ALI (O.A.), KHEIR (S.A.M.), ABU DAMIR (H.), BARRI (M.E.S.). Observation sur l'ecthyma contagieux du dromadaire (*Camelus dromedarius*) au Soudan. *Revue Élev. Méd. vét. Pays trop.*, 1991, **44** (2) : 143-145. Les symptômes et la pathologie de l'ecthyma contagieux des chamelons au Soudan ont été étudiés. Les animaux manquaient d'appétit, étaient amaigris et légèrement anémiés. La maladie s'est manifestée par des lésions cutanées autour des lèvres et des naseaux. Dans quelques cas, la jonction entre la peau et la muqueuse était concernée. Au point de vue pathologique, on note l'apparition de vacuoles dans les couches épithéliales. Les zones concernées étaient le siège de lésions ulcératives et d'hémorragies et une surinfection bactérienne secondaire était fréquente. Le microscope électronique s'est révélé très utile pour un diagnostic différentiel rapide. *Mots clés* : Dromadaire - *Camelus dromedarius* - Ecthyma contagieux - Diagnostic - Soudan.

Introduction

Camel contagious ecthyma (CCE) is caused by an epitheliotropic virus (parapox virus) of the family of poxviridae (2, 3, 4). It primarily affects young animals producing most regularly localized lesions and frequently generalized changes that resemble camel pox (CP) (3, 5), but unlike the latter, the lesions in CCE are self-limiting and resolve with spontaneous healing. Death, however, may occur due to starvation or secondary infection (1, 4). This report describes the clinical and pathological features of the disease in a natural outbreak in young camels in the Sudan with the subsequent detection of the virus by direct electron microscopy.

Materials and Methods

The disease was observed in a nomadic herd of 700 camels (*Camelus dromedarius*) in Western Sudan during August 1986. Forty 2 to 14-month old camels were affected. The laboratory specimens were obtained from 10 camel calves of the affected group and from six, apparently healthy others of the same age, used as controls. Haematological parameters and blood chemistry were performed as described previously (9, 10), while serum

calcium and cholesterol were measured by standardized kits (Reactive Gramatest, Spain). Skin biopsies were obtained and processed for histopathology and negative contrast electron microscopy.

Results

As reported here, camel calves were the main target of the disease although involvement of adult animals could not be ruled out. The clinical signs of the affected animals were in accordance with previous observations (1, 4, 5, 6) and consisted mainly of localized skin lesions of different magnitude, severity and location. The changes were confined to the skin around the lips and nostrils with occasional involvement of the mucocutaneous junctions and the mucosa of the mouth. The affected areas were nodular, usually ulcerated and haemorrhagic (photo 1). Enlargement of some superficial lymph nodes was also observed in some animals.



Photo 1 : A camel with CCE infection. Partially healing lesions around the mouth and nostril. The lower lip is pendulous.

The haemogram is presented in table I. A significant increase in the MCV ($P < 0.01$) and WBC count ($P < 0.05$), as compared with values of the controls was evident. The RBC count was significantly lowered ($P < 0.05$) while PCV, Hb and MCHC values remained unchanged. Serum analysis indicated a significant increase in all the tested parameters except serum albumin (table II).

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TABLE I Haematological values in camels naturally infected with CCE.

Number of animals	RBC ($\times 10^6/\text{mm}^3$)	WBC ($\times 10^3$)	PCV (%)	Hb (g/dl)	MCV (μ^3)	MCH (%)	MCHC μg
Infected n = 9	7.59 \pm 1.21 (6.52-10.46)	21.6 \pm 7.6 (7.45-31.9)	24.9 \pm 3.28 (20.5-32.0)	10.9 \pm 1.26 (9.2-13.5)	32.9 \pm 1.64 (30.6-35.09)	14.5 \pm 0.99 (13.4-15.7)	44.09 \pm 1.9 41.6-47.6
Control n = 6	9.41 \pm 1.47 (8.22-11.85)	12.08 \pm 2.87 (7.1-14.9)	27.58 \pm 2.25 (25.0-31.0)	11.8 \pm 1.02 (10.8-13.6)	29.7 \pm 2.53 26.6-31.3	12.7 \pm 1.5 (10.3-14.3)	42.88 \pm 2.23 (38.6-43.9)
Level of significance	P < 0.05	P < 0.05	NS	NS	P < 0.01	NS	NS

Values are given as means \pm standard error. Ranges are written in parenthesis. NS : not significant.

TABLE II Biochemical values of sera from camels naturally infected with CCE.

	Cholesterol (mg/100 ml)	Ca (mg/100 ml)	Total protein (g/100 ml)	Albumin (g/100 ml)	Globulin (g/100 ml)	Albumin/ globulin ratio
Infected n = 10	40.04 \pm 14.59 (12.9-57.9)	9.1 \pm 0.46 (8.2-9.64)	7.77 \pm 4.74 (7.3-8.5)	3.23 \pm 0.020 (2.9-3.52)	4.53 \pm 0.44 (3.84-5.25)	1 : 1.4
Control n = 6	26.0 \pm 7.01 (19.7-32.8)	9.7 \pm 0.33 (9.37-10.3)	7.16 \pm 0.42 (6.7-7.79)	3.41 \pm 0.38 (3.02-4.0)	3.76 \pm 0.35 3.44-4.19	1 : 1.1
Level of significance	P < 0.05	P < 0.05	P < 0.05	NS	P < 0.01	

Values are given as means \pm standard error. Ranges are written in parenthesis. NS : not significant.

Microscopic examination of the affected skin demonstrated vacuolar changes of the epithelial cells accompanied by focal ulcerations, neutrophilic infiltrations and superficial bacterial colonies. Areas of hyperkeratosis and acanthosis were apparent. Intracytoplasmic inclusion bodies were scarce. Negative contrast electron microscopy revealed sparsely scattered viral particles. These were typical to those observed in CCE infection (1, 4, 6) and approximately of 160 x 360 nm in size. Their surface was wrapped by uniformly arranged outer tubules (photo 2).

Discussion

Camel contagious ecthyma, a poorly studied pox-like disease, has not frequently been reported from different parts of the world (1, 3, 5, 6). In the Sudan, CCE is believed to exist for years, but has never been reported. Locally, the disease called Abu Shalambo, is thought to be different from camel pox (CP). The latter tends to indiscriminately infect different age groups and produces more severe, widely distributed lesions. In

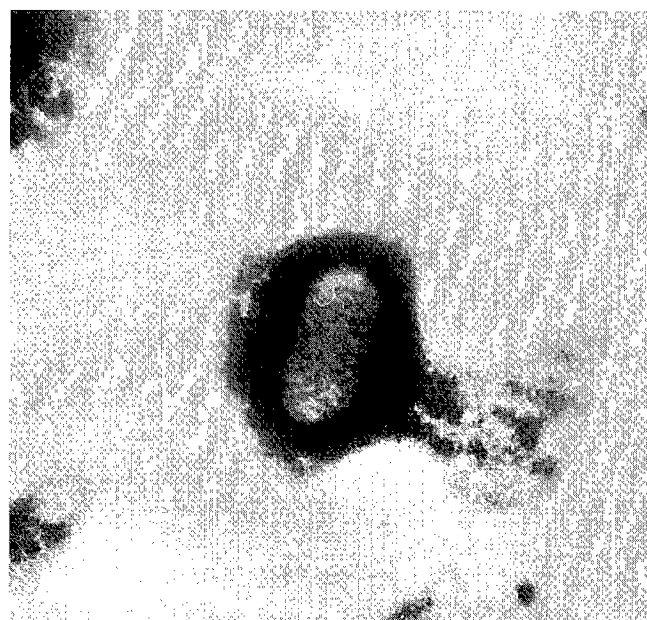


Photo 2 : Negatively stained electron micrograph of CEE virus (x 60 000).

contrast, CCE primarily affects young animals and causes, if not complicated, localized, self-limiting infection (1).

The mild macrocytic anaemia (table I), is possibly attributable to a long-standing starvation. The latter appeared to arise from the mouth lesions depriving animals from proper feeding. Similarly, the slight increase in serum proteins and particularly globulin fraction along with the increase in WBC count are thought to originate from the disease and/or from a superimposed secondary infection, perhaps as a result of immunostimulation.

Clinically, CEE is indistinguishable from CP, especially when both diseases coexist in the same locality and when CCE undergoes a generalized course (1, 3, 5). Nevertheless, a substantiated distinction can be achieved using the characteristic morphologic appearance of these two related viruses. The negative contrast electron microscopy serves here as a confirmative and time-saving procedure for differentiation and this method is highly recommended, whenever available, for quick diagnosis and adoption of the appropriate control measures.

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The clinical and pathological features of the contagious ecthyma in camel calves in the Sudan were investigated. The animals were inappetent, emaciated and slightly anaemic. The disease was characterized by skin lesions around the lips and nostrils with occasional involvement of mucocutaneous junctions. The pathology includes vacuolar changes of the epithelial layers. Affected areas were ulcerated, haemorrhagic and with frequent secondary bacterial surinfection. Negative contrast electron microscopy has proven to be an extremely useful procedure for quick differential diagnosis. *Key words* : Camel - *Camelus dromedarius* - Contagious ecthyma - Diagnosis - Sudan.

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