Outbreaks of contagious ecthyma in camels (*Camelus dromedarius*) in the Turkana district of Kenya

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**Summary:** Mortality among camel calves (*Camelus dromedarius*) is one of the most serious problems faced by camel herdsmen and, although there are several reasons for this mortality, diseases play a major role. In an investigation of outbreaks of contagious ecthyma in camels in the Turkana district of Kenya, four outbreaks were detected involving only camel calves. The principal lesions were distinct or largely coalesced pustules on the mouth, nose and muzzle. Direct electron microscopy of infected scabs was used to confirm the presence of the virus. Secondary infection of the pustules was common in affected calves. Morbidity in affected herds was 100%, with no adult involvement. Affected calves were unable to suckle properly. In all outbreaks, there was a concurrent outbreak of contagious pustular dermatitis in goat kids in the same household. Contagious ecthyma is an important disease in camels, contributing to calf debility and eventually to high calf mortality.

KEYWORDS: Camels – Contagious ecthyma – Kenya – Outbreaks – Turkana.

**INTRODUCTION**

Contagious ecthyma in camels (*Camelus dromedarius*) is a parapoxvirus disease which has been described in Mongolia (4, 2), Somalia (3), the former Soviet Union (11) and the Sudan (1). Only one outbreak has been reported in Kenya (7). No investigation has been made in a specific camel-rearing area to determine the geographical spread of the disease. As calf mortality is the most important health problem faced by camel herders (8), sometimes reaching 50%, it is important to examine any potential factor which may contribute to the debility of camel calves and hence to such mortality. Visits were therefore made to the Turkana district in Kenya, one of the principal camel-rearing areas in the country, and skin conditions were examined in several herds.

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MATERIALS AND METHODS

Epidemiology

The Turkana district is an arid area receiving less than 500 mm of scattered rainfall annually. In this district, approximately 100,000 camels are reared by pastoralists in herds ranging in size from 2 animals to 60 or more. The district was visited in the dry month of September, and 600 camels were examined in 30 herds ranging in size from 2-60 animals. Skin conditions were closely scrutinised and scabs were obtained from suspected pox lesions.

Electron microscopy

Skin scabs from infected camels were ground and re-suspended in a minimum volume of phosphate buffered saline (pH 7.2). An electron microscope grid was floated on a drop of virus suspension for two minutes, then removed and blotted with the edge of a piece of blotting paper, and placed on a drop of 2% sodium phosphotungstate (pH 6.6). After 90 s, the grid was blotted, air dried and examined using a transmission electron microscope operating at 60,000 V.

RESULTS

Contagious ecthyma was detected in camels in four areas of the Turkana district (Table I). Of 600 camels examined, clinical contagious ecthyma was detected in 67 animals, indicating a point prevalence rate of 11.2%. In the four areas, contagious ecthyma was found to be at the same clinical stage, although the areas are very far apart. The condition had been present for one week and only eight-month-old camels were affected. Morbidity was 100% in each of the affected flocks.

The principal clinical feature observed was the appearance of pustules on the nose, muzzle and lips (Fig. 1). Many of the cervical and mandibular lymph nodes were swollen and oedematous. Frequently, these swollen lymph nodes had been branded with a hot iron, which is a common practice among pastoralists in the area. Parapox infection was confirmed by electron microscopy in most cases (Fig. 2). The majority of these lesions

<table>
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<th>EM+</th>
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<td>5</td>
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</table>

EM+: infection detected by electron microscopy

Table I

Outbreaks of contagious ecthyma in camels and goats in the Turkana district of Kenya
Pustules on the muzzle and lips of a camel calf infected with contagious ecthyma had secondary infections and thick yellowish pus had accumulated beneath the scabs. In areas of the skin with no secondary infections, raw hyperaemia was observed beneath the scab. No lesions were observed on the udders of the dams of these calves, nor on the skin of any of the adult camels examined.

In all the areas where outbreaks of contagious ecthyma were observed in camels, infection was also apparent in goat kids (Table I). Lesions in kids were of a similar type and at a similar stage, showing pustules principally on the lips, muzzle and nose. Extensive secondary infection was also observed in goat kids, with thick yellowish pus underneath some of the scabs (Fig. 3). Pox lesions were also visible on the udders of ten dams suckling some of the affected goat kids.

DISCUSSION

Camel rearing is a difficult process, due to the low reproductive rate of the camel and high calf mortality (sometimes reaching 50%) (8). It is therefore important to examine some of the factors which may contribute to the weakening of calves and thus to high mortality.

The current study indicates that contagious ecthyma is enzootic in camels in the Turkana district of Kenya, and is present principally in camel calves. The fact that a similar clinical stage of the disease was observed in different geographical areas is
probably related to the fact that camels are seasonal breeders and many calves are therefore born at approximately the same time.

Morbidity of 100% in calves has also been described by other researchers, but this rate was reported to be low (10-20%) in adult camels (7). The common practice of keeping all camel calves in the same shelter at night could be responsible for the spread of virus by contact. The absence of contagious ecthyma in mature animals is probably due to an immune response which is absent in very young camels; such a pattern has been described for goat kids (10). In this study, only localised lesions on the muzzle and lips were found. Similar signs have been reported in Somalia (6) and the Sudan (1). Generalised lesions involving the distal parts of the legs, the inner thighs and the vagina in females have also been reported (7).

All outbreaks occurred in herds where parapoxvirus infection was also observed in goat kids raised nearby. Other reports have indicated that outbreaks of contagious ecthyma in camels have occurred in areas where orf is present in sheep (7). Outbreaks of parapoxvirus infection in alpacas (Lama pacos), steenbok (Raphicerus campestris) (9) and many other animals are thought to be of ovine or caprine origin (10). This is probably also the case for contagious ecthyma in camels.

No programme exists for the vaccination of camels or goats against contagious ecthyma virus in the camel-rearing areas of Kenya, probably due to lack of information, the vast distances to be covered in the arid lands and the lack of resources. This study may therefore serve as a basis for the establishment of such a programme.
FIG. 3

Pustules on the muzzle and lips of a goat kid infected with contagious ecthyma

Other conditions which may be similar to contagious ecthyma were precluded by the clinical signs. Mange infection is associated with general pruritis and alopecia on many parts of the body surface. Camels are not likely to suffer clinically from foot and mouth disease, although the animals may react to experimentally-inoculated foot and mouth disease virus (5).

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ÉPIDÉMIES D'ECTHYMA CONTAGIEUX CHEZ LES DROMADAIRES (CAMELUS DROMEDARIUS) DANS LE DISTRICT DE TURKANA AU KENYA. — C.G. Gitao.

Résumé : La mortalité des jeunes dromadaires (Camelus dromedarius) est l'un des problèmes les plus graves auxquels soient confrontés les éleveurs. Parmi les différentes causes de cette mortalité, les maladies jouent un rôle majeur. Lors d'une étude sur l'ecthyma contagieux chez les dromadaires, effectuée dans le district de Turkana, au Kenya, quatre foyers ont été décelés qui ne concernaient que de jeunes animaux. Les principales lésions consistaient en des pustules isolées ou largement confluentes, localisées dans la bouche, dans les naseaux et sur le museau. L'observation directe au microscope électronique des croûtes infectées a permis de confirmer la présence du virus. Une infection secondaire des pustules a été fréquemment observée chez les jeunes dromadaires atteints.
La morbidité était de 100 % dans les élevages atteints, mais elle ne concernait pas les adultes. Les chamelons étaient incapables de téter correctement. Dans tous les cas, on a observé une épidémie concomitante de dermatite pustuleuse contagieuse chez les chevreux dans la même exploitation. L'ecthyma contagieux est une maladie grave du dromadaire chez lequel elle entraîne une asthénie, voire une mortalité élevée dans le cas des jeunes sujets.


BROTES DE ECTIMA CONTAGIOSO EN LOS DROMEDARIOS (CAMELUS DROMEDARIUS) DEL DISTRITO DE TURKANA, EN KENIA. – C.G. Gitao.

Resumen: La mortalidad de los dromedarios jóvenes (Camelus dromedarius) es uno de los problemas más graves que deben enfrentar los ganaderos; entre sus causas, las enfermedades ocupan un lugar principal. En ocasión de un estudio sobre el ectima contagioso en los dromedarios en el distrito de Turkana, en Kenia, se detectaron cuatro brotes que incluían solamente animales jóvenes. Las lesiones más importantes consistían en pústulas aisladas o ampliamente confluentes, localizadas en la boca, las narices y el hocico. La observación directa en microscopio electrónico de las costras infectadas permitió confirmar la presencia del virus. Una infección secundaria de las pústulas se observó a menudo en los jóvenes dromedarios afectados. La morbilidad fue del 100% en los rebaños afectados, pero no implicaba a los animales adultos. Los más jóvenes eran incapaces de mamar correctamente. En todos los casos, se observaron brotes concomitantes de dermatitis pustulosa contagiosa en los cabritos de la misma explotación. El ectima contagioso es una enfermedad grave del dromedario, que puede causar astenia e incluso una mortalidad elevada en los animales jóvenes.


REFERENCES


