

Lymphadenitis in sheep and goats in the Sudan

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Key words

Sheep - Goat - *Corynebacterium pseudotuberculosis* - Lymphadenitis - Bacteriosis - Morbidity - Sudan.

Summary

The prevalence and course of caseous lymphadenitis (CLA) were investigated in sheep and goats in the Sudan. Carcasses of 1118 sheep and 626 goats of both sexes were examined for the disease. Seventy-one sheep (6.35%) were found infected with lesions occurring as single or multiple abscesses or as inflammatory processes in different organs. Some of these lesions exhibited a miliary form resembling that of tuberculosis. Forty-four goats (7.05%) were also found infected with CLA but all their lesions were single location abscesses of superficial and pulmonary lymph nodes. The disease was more progressive in sheep than in goats. CLA was found to have an impact on the health and natural breeding of sheep and goats, the economy and food of the people in the country.

■ INTRODUCTION

The Sudan owns approximately 37,000,000 sheep and 30,000,000 goats. Both species are reared under traditional farming systems. They contribute effectively in providing food for the people of the country and foreign exchange earnings by exportation.

At antemortem and postmortem examinations in abattoirs, caseated lymph nodes are among the major causes of animal rejection or meat condemnation. The caseations are mostly believed to be due to *Corynebacterium pseudotuberculosis* (5), but little information is available about the incidence and complications of the disease caused by the organism in the Sudan.

■ MATERIALS AND METHODS

This study was undertaken to reveal the situation of caseous lymphadenitis (CLA) in sheep and goats in South Darfur State. This State owns the largest population of livestock including sheep and goats, which are mainly reared under pastoral nomadism.

Sheep and goats' carcasses were examined periodically for one year at Nyala abattoir in South Darfur State for the presence of caseated lymph nodes and organs. These were collected and sent to the laboratory for cultural identification of the causative agents

according to Cowan and Steel (2) and other conventional methods. Three representative isolates from sheep and goats were tested for drug sensitivity using Oxoid™ antibiotic sensitivity disks, some of which being known to inhibit *C. pseudotuberculosis*.

■ RESULTS

The bacteriological investigation results established that the organisms isolated from pyogenic processes in sheep and goats were *C. pseudotuberculosis* and were indistinguishable from each other. Moreover, the strains had similar drug sensitivity or resistance patterns (table I). Samples that were not positive for *C. pseudotuberculosis* had not been considered.

CLA in sheep

Out of 1118 sheep examined, 71 (6.35%) were found infected with CLA. Of the 421 males and 458 females, 28 (6.65%) and 36 (7.86%), respectively, were positive. The remainder had not been identified with regard to sex. Infected sheep were 1-3 years of age. In 64 (90.14%) cases, the infections were single location abscesses of the lymph nodes and occasionally of pus containing nodules which were as large as the caseated lymph nodes. In one ewe the udder was found severely infected with purulent inflammation. In 5 (7.03%) of the infected sheep the infection was in the form of either two or three localized abscesses. The remaining 2 infected sheep (2.82%) had generalized

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Table I

Drug sensitivity test results of sheep and goat strains

Antibiotics and concentrations	Sensitivity test results (in ml)		
	Sheep 1	Sheep 2	Goat
Streptomycin 10 µg	resistant -	resistant -	resistant -
Furazolidone 15 µg	resistant -	resistant -	resistant -
Nitrofurantoin 32 µg	4.5 mm +	4 mm +	4.5 mm +
Ampicillin 10 µg	11 mm +	8 mm +	11 mm +
Penicillin 2 units	4 mm +	4 mm +	5.6 mm +
Tetracycline 20 µg	11 mm +	7 mm +	9.5 mm +
Chloramphenicol 30 µg	10 mm +	9 mm +	12 mm +
Cephazolin 30 µg	2.25 mm -	resistant -	2.25 -

+ Sensitive; - Not sensitive

infections. In one of them, a severe caseous inflammatory process was found not only in the lymph nodes, but in the lungs, heart, liver, spleen and peritoneum as well. In the organs, especially in the liver and spleen, the disease exhibited a miliary form resembling that of tuberculosis.

Eighty-nine lesions were encountered altogether in the infected sheep. Seventy (78.7%) of these lesions were found in the superficial lymph nodes or adjacent to them, i.e., 30 (33.7%), 13 (14.6%), 9 (10.1%), 7 (7.9%), 6 (6.7%) were in the prescapular, precrucial, supramammary, inguinal, popliteal lymph nodes, respectively, and 5 (5.6%) abscesses were adjacent to the popliteal and prescapular lymph nodes. Twelve (13.5%) of the lesions were found in the visceral lymph nodes, i.e., 9 (10.1%) and 3 (3.4%) were in the pulmonary and hepatic lymph nodes, respectively. The 7 remaining lesions (7.9%) were suppurative infections in different organs, as mentioned above, and there was also an abscess in the uterus suspensory ligaments.

The lesions distribution suggests that most of the infections occurred through superficial wounds. Others developed through the digestive or respiratory systems and were drained by the local lymph nodes and/or disseminated hematogenously to the visceral organs.

CLA in goats

A total of 626 goats of both sexes, 1-3 years of age, were examined. Forty-four (7.03%) were found infected with CLA, i.e., 27 out of 339 (7.9%) males, 13 out of 237 (5.5%) females, and the sex had not been determined for the remainder. All the infections (100%) were single location abscesses of the lymph nodes, but for one large abscess adjacent to the prescapular node, similar to those described in sheep. Thirty-five (79.5%) of the disease lesions were found in the superficial lymph nodes, i.e., 14 (31.8%), 9 (20.5%), 6 (13.6%), 3 (6.8%), 2 (4.5%) were in the prescapular, precrucial, popliteal, supramammary and inguinal lymph nodes, respectively, and 1 (2.3%) abscess was adjacent to the prescapular lymph nodes. Nine (20.5%) of the lesions were in the visceral lymph nodes exclusively confined to the lungs. As a result it seems that superficial wounds and the respiratory system are the main routes to infections in goats. The pulmonary lymph node lesions were twice as common in goats than in sheep. It was observed that the disease in goats was less progressive than in sheep. In this study, other conditions, such as orchitis, attributed to *C. pseudotuberculosis* were also encountered in both species in the diagnostic laboratory at Nyala.

Vital meat parts like forequarters and hindquarters, livers and lungs drained by the infected lymph nodes were condemned in both species during the examination. Carcasses of two sheep with generalized infections were also totally condemned.

DISCUSSION

Brown and Olander (1) stated that the disease incidence is higher in areas where intensive breeding is practiced. They cited 58 and 7.5% incidence rates in sheep and goats, respectively, in Australia. In the Sudan, shearing or dipping is not practiced. Most workers believe that their implementation is the predisposing factor to CLA infection in sheep and goats. However, scratches and wounds inflicted by thorns and hard sharp objects in wooded savannah land are suggested to be predisposing factors to the disease. Stagnant water pools attended by many animals after the end of the rainy season could be other sources of infection.

C. pseudotuberculosis liberates necrotizing toxins and resists digestion by phagocytes (1). As a result it could become localized along the drainage system of a lymph node. This results in the accumulation of phagocytes until an abscess is formed, like in this study where abscesses were found adjacent to many nodes. In sheep and goats CLA was found to cause general unthriftiness because of the involvement of the organs described above. It could also interfere with normal breeding when infecting organs like the udder, uterus and testicles. Brown and Olander wrote that the disease is zoonotic, in that several persons exposed on the job or who had consumed raw milk were found infected (1). Goldberger *et al.* also reported a case of *C. pseudotuberculosis* infection in a person who had drunk raw goats' milk (3). Similarly, Keslin *et al.* found a respiratory tract infection in a veterinary student caused by the same organism possibly acquired from a bacteriology laboratory (4). Besides its public health importance the disease also causes substantial economical losses. As a result there is a need to study the CLA epidemiology. This will help better understand its spreading process and thus lead to the implementation of effective control measures.

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Résumé

Musa M.T. Lymphadénite chez des moutons et des chèvres au Soudan

La prévalence et l'évolution de la lymphadénite caséuse (CLA) ont été étudiées chez des moutons et des chèvres au Soudan. Les carcasses de 1 118 moutons et 626 chèvres des deux sexes ont été examinées pour déterminer la présence de la maladie. Soixante et onze moutons (6,35 p. 100) étaient infectés. Ils présentaient des lésions sous forme d'abcès unique ou multiples, ou de processus inflammatoire dans divers organes. Certaines de ces lésions étaient de forme milliaire ressemblant à celles de la tuberculose. Quarante-quatre chèvres (7,05 p. 100) étaient aussi infectées par CLA mais leurs lésions n'étaient présentes qu'en un seul endroit, sous forme d'abcès des nœuds lymphatiques superficiels et pulmonaires. La maladie était davantage progressive chez les moutons que chez les chèvres. Il a été trouvé que CLA avait un impact sur la santé, la reproduction naturelle des moutons et des chèvres, l'économie et l'alimentation des habitants du pays.

Mots-clés : Ovin - Caprin - *Corynebacterium pseudotuberculosis* - Lymphadénite - Bactériose - Morbidité - Soudan.

Resumen

Musa M.T. Linfadenitis en ovejas y cabras en Sudán

Se investigó la prevalencia y el curso de la linfadenitis caseosa (CLA) en ovejas y cabras en Sudán. La enfermedad se examinó en 118 carcasas de ovejas y 626 de cabras de ambos sexos. Se encontraron setenta y un ovejas (6,35%) infectadas, con lesiones como abscesos únicos o múltiples o con procesos inflamatorios en diferentes órganos. Algunas de estas lesiones presentaron forma miliar, similar a la tuberculosis. También se encontraron cuarenta y cuatro (7,05%) cabras infectadas con CLA, pero todas estas lesiones fueron abscesos únicos en linfonodos superficiales y pulmonares. La enfermedad presentó mayor progresión en ovejas que en cabras. CLA presentó un impacto sobre la salud y la reproducción natural de las ovejas y cabras, la economía y la alimentación de la población en el país.

Palabras clave: Ovino - Caprino - *Corynebacterium pseudotuberculosis* - Linfadenitis - Bacteriosis - Morbosidad - Sudán.