

Caseous Lymphangitis in a Goat Farm

M. Ranjithkumar*, M. Saravanan, P. Ponnusamy, P. Selvaraj

Teaching Veterinary Clinical Complex, Veterinary College and Research Institute, Orathanadu - 614625

Abstract

Caseous lymphadenitis (CL) is a sporadic bacterial disease of chronic suppurative lymphadenitis in goats. The prevalence of caseous lymphadenitis is considered high in many countries, but detailed research on prevalence rates, farm practices, and abattoir findings is limited in India. This paper reports the presence of this disease on an endemic form in a goat farm. A two-year-old mixed breed doe was presented with the history of swelling in mandibular region and inappetence for the past one week. Greenish pus was aspirated from it and Giemsa stain confirms the presence of coccobacillus bacteria. Culture and isolation identified it as *Corynebacterium pseudotuberculosis* on 10% sheep blood agar. The abscess drained off, flushed with 5 % iodine solution and treated with injection lincomycin @ 10 mg/kg until recovery. Clinical investigation in the farm after a month revealed that four more animals were affected with caseous lymphadenitis. All of them confirmed based on bacterial culture and isolation. Rearing goats as semi-intensive flocks, sharing of grazing fields together with other animals, commingling of animals after grazing particularly in the night time, rupture of abscess in the shelter itself, improper knowledge about disease and poor husbandry practices favours the endemicity of this disease in goats.

Keywords: Goats, Caseous Lymphadenitis, Endemicity, Lincomycin

Introduction

Goats are multifunctional animals, mostly maintained by small scale, landless farmers particularly in the developing countries (Devendra and Liang, 2012). Asia has the largest world population of goats of about 60% (556 million, followed by Africa with 311 million). India (35.2%), China (29.3%) and Pakistan (12.0%), together maintain 77% of the world population and 42% of all goat breed types. Goat production system in India has been slowly moving from extensive to intensive system of management. Intensive goat farming leads to spreading of many diseases which results in high mortality (Sahoo *et al.*, 2019). Caseous lymphadenitis (CL) caused by *Corynebacterium pseudotuberculosis* is a chronic disease of small ruminants distributed worldwide (Varela-Castro *et al.*, 2017). The bacteria can survive in faeces or can be found on the ground for several weeks (Windsor, 2011), favouring its dissemination (Williamson, 2001). The principal route of infection is through oral mucosa or skin wounds. Chronic suppurative lymphadenitis of external and internal lymph nodes has been described in sheep and goats (Gururaj *et al.*, 2018). Abscesses are usually found externally on goats, but the visceral form is more common in sheep (Williamson, 2001). The ability of the organism to survive in the animal's environment for

several weeks contributes to its ability to spread within a flock. Economic losses result mostly from condemnation of infected carcasses and devaluation of hides (Mittal *et al.*, 2010). In a study by Kumar *et al.*, (2012), 51.9 % pus samples from suspected cases of CLA yielded *C. pseudotuberculosis* on culture on Sirohi goats of Rajasthan. There are only few reports of its occurrences among sheep and goats in India (Mohan *et al.*, 2008). CL is considered one of the most economically important diseases in many countries however, being a non-notifiable disease in many countries including India, its actual prevalence, extent of infection and associated losses have been largely underestimated (Kumar *et al.*, 2013). This paper reports the presence of this disease in a goat farm.

Case History and Treatment

A two-year-old mixed breed doe was presented to the Teaching Veterinary Clinical Complex, Orathanadu with the history of swelling in mandibular region and inappetence for the one week (Fig 1). The swelling was slow developing in nature and grows over weeks. On palpation it was found that the animal had abscess on the mandibular lymph node. The abscess was aspirated and sample was sent to culture and isolation of organism. The pus was greenish in color with blood mixed in nature (Fig 4). Giemsa stain confirms the presence of coccobacillus bacteria and further, *Corynebacterium pseudotuberculosis* was isolated on

*Corresponding author: clmranjith@gmail.com

10% sheep blood agar when incubated at 37 °C for 48–72 hours. The colony was observed as yellowish white, opaque convex colonies with matt surface. No visceral abscess was ruled out by survey radiography of thorax and abdominal ultrasound. The abscess was completely drained, flushed with povidone iodine and the pus material was disposed safely. The animal was treated with parenteral lincomycin (@ 10 mg/kg) until recovery. One month later the owner brought another

animal with the swelling in the prescapular area (Fig 3). It was found that the abscess was similar to previous animal and aspirated pus was whitish, thick and caseous in nature. Culture and isolation point the same etiology. Visit to the goat farm identified four more-animal with CL. Occasional rupture of abscess (Fig 2) use to occur in some animals. All the affected animals were treated with lincomycin for five days. The owner was advised to isolate the affected animals.



Fig 1. Mandibular abscess due to CL

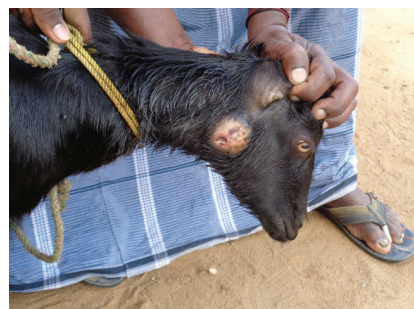


Fig 2. Ruptured abscess with fistulous tract in mandibular lymphnode



Fig 3. Prescapular abscess due to CL

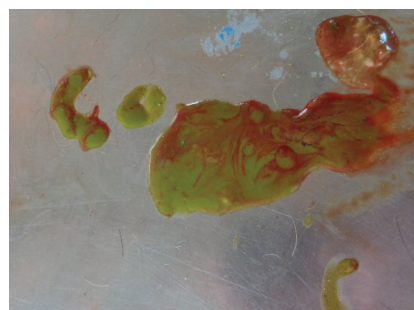


Fig 4. Greenish blood mixed pus drained from CL

Discussion

Caseous lymphadenitis is a chronic bacterial disease of sheep, goats and other warm blooded animals (Dorella *et al.* 2006). The prevalence of caseous lymphadenitis was found to be significantly higher in adult than in young animals, in both sheep and goats (Abebe and Tessema, 2015). All the affected animals in our report were adults. The disease presents in two main forms: an external form characterized by infection of subcutaneous tissue and superficial lymph nodes and an internal form characterized by abscess development in internal (Williamson 2001). The cases presented in this paper were of superficial form. Radiographic and ultrasonographic examination did not reveal involvement of the internal organs. The use of imaging modalities such as radiography, ultrasound, or CT may increase the detection of internal abscesses (Grosso *et al.*, 2020). Further all of the affected animals in the herds

were healthy and with adequate weight gain. Differences in the place of the abscesses between sheep and goats have been reported, the superficial form among goats is common (Guimarães, *et al.*, 2011; Umer, *et al.*, 2017). Internal involvement can be subclinical, but it is associated with weight loss and ill thrift (Williamson 2001). External abscesses in the lymph nodes of the head and neck are more common in goats than sheep (Guimarães, *et al.*, 2011). The superficial lymph nodes of mandibular, parotid, cervical, subiliac, popliteal or mammary tissue and in subcutaneous tissues are affected more commonly (Umer *et al.*, 2017). The reported cases in study also had abscess in mandibular and prescapular lymphnodes. Bacterial isolation is necessary to identify the causative agent (Guimarães, *et al.*, 2011). Hence all the pyogenic materials were cultured in 10 % sheep blood agar and colonies were confirmed by stained smears in our report as per Mohan *et al.* (2008). The

abscess matures and ruptures through a fistula, draining infective purulent into the environment (Williamson 2001) and similar draining tracts were noticed in the present study. The 99.25% isolates of *Corynebacterium* are susceptible to lincomycin (Maria da *et al.*, 2013). Transmission can occur through direct or indirect contact or through wounds that come into contact with pus from the abscesses of sick animals, the organism can also penetrate the intact skin (Baird and Fontaine, 2007). Bacterial survival is improved when it is mixed with particulate fomites like wood, straw, and feces. (Williamson 2001). This paper reports the endemicity of the caseous lymphadenitis in a goat flock.

References

- Abebe, D., and Tessema, S.T., 2015. Determination of *Corynebacterium pseudotuberculosis* prevalence and antimicrobial susceptibility pattern of isolates from lymph nodes of sheep and goats at an organic export abattoir, Modjo, Ethiopia. *Lett. Appl. Microbiol.* **61**: 469–476
- Al-Gaabary, M.H., Osman, S.A., Ahmed, M.S. and Oreiby, A.F. 2010. Abattoir survey on caseous lymphadenitis in sheep and goats in Tanta, Egypt. *Small Rumin. Res.* **94**:117–124
- Baird, G.J. and Fontaine, M.C. 2007. *Corynebacterium pseudotuberculosis* and its role in ovine caseous lymphadenitis. *J. Comp. Pathol.* **137**(4):179-210
- Devendra, C. and Liang, J.B., 2012. Conference summary of dairy goats in Asia: Current status, multifunctional contribution to food security and potential improvements. *Small Rumin. Res.* **108**: 1– 11.
- Dorella, F.A., Pacheco, L.G.C., Oliveira, S.C., Miyoshi, A. and Azevedo, A. 2006. *Corynebacterium pseudotuberculosis*: microbiology, bio-chemical properties, pathogenesis and molecular studies of virulence. *Vet. Res.* **37**: 201–218.
- Grosso, F.V., Tinkler, S., Sola, M., Miller, M. and Heng, H, G. 2020. Radiographic and computed tomographic appearance of caseous lymphadenitis in a goat. *Vet Radiol. Ultrasound*, **61**(1): E6-E11.
- Guimarães, A.D., Carmo, F.B., Pauletti, R.B., Seyffert, N., Ribeiro, D., Lage, A.P., Heinemann, M.B., Miyoshi, A., Azevedo, V. and Gouveia, A.M.G. 2011. Caseous lymphadenitis: epidemiology, diagnosis, and control. *IIOAB J.* **2**(2): 33-43
- Gururaj, K., Singh, D.D., Pawaiya, R.V.S., Andani, D., Gangwar, N.K., Mishra, A.K., Chaturvedi, V., and Kumar, A. 2018. Investigation of an Outbreak of Caseous Lymphadenitis in Goats. *Ind J Small Rum.* **24**(1): 95-10
- Kumar, J., Singh, F., Tripathi, B.N., Kumar, R., Dixit, S.K. and Sonawane, G.G. 2012. Epidemiological, bacteriological and molecular studies on caseous lymphadenitis in Sirohi goats of Rajasthan India. *Trop Anim Health Prod.* **44**:1319–1322
- Kumar, J., Tripathi, B.N., Kumar, R., Sonawane, G.G. and Dixit, S.K. 2013. Rapid detection of *Corynebacterium pseudotuberculosis* in clinical samples from sheep. *Trop Anim Health Prod.* **45**(6):1429-35
- Maria da C.A., Veschi, J.L.A., Santos, G.B., Amanso, E.S., Oliveira, S.A.S., Veneroni-Gouveia, R.A.M.G. and Costa, M.M. 2013. Activity of disinfectants and biofilm production of *Corynebacterium pseudotuberculosis*. *Pesq. Vet. Bras.* **33**(11):1319-1324
- Mittal, D., Folia, G., Singh, Y. and Singh, J. 2010. Caseous lymphadenitis in beetal goats at an organized farm. *Haryana Vet.* **49**: 66-67
- Mohan, P., Vathsala, M. and Jayaprakasan, V. 2008. Comparative characterization of *Corynebacterium pseudotuberculosis* from goats in Kerala, India and reference strain. *Small Rumin. Res.* **74**: 226–230.
- Sahoo, B., Kumar, A., Panda, A.K., Samal, P., Sarangi, D.N. and Srivastava, S.K. 2019. Goat farming for improving livelihood security of farm women, technical bulletin no. 33, ICAR, Central institute for women in agriculture, Bhubaneswar, Odisha, Pp. 1-49.
- Tripathi, B.N., Kumar, J., Sonawane, G.G., Kumar, R. and Dixit, S.K. 2016. Microbiological and Molecular Investigation of Clinically Suspected Caseous Lymphadenitis Cases in Goats. *Agric Res.* **5**: 413-419.
- Umer, M., Abba, Y., Abdullah, F.J., Saleh, W.M.M., Haron, A.W., Saharee, A.A., Ariff, A.B., Baiee, F.H.A., Hambali, I.U. and Sharif, A. 2017. Caseous lymphadenitis in small ruminants: An overview on reproductive implications. *Int. J. Vet. Sci. Anim. Husb.*, **2**(2): 23-31.
- Varela-Castro, L., Lara-Vergara, J., Ortega, N., Salinas, J., Colom-Cadena, A., Lavín, S., Tizzani, P., Velarde, R., Serrano, E. and Mentaberre, G. 2017. Endemic caseous lymphadenitis in a wild Caprinae population. *Vet Record*, **180**(16): 405-410
- Williamson, L.H. 2001. Caseous lymphadenitis in small ruminants. *Vet. Clin. North Am. Food Anim.* **17**: 359–371.
- Windsor, P. A. 2011. Control of caseous lymphadenitis. *Vet. Clin. North Am. Food Anim.* **27**: 193–202