University of Mosul
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College of Veterinary Medicine
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Website:

Lecture title: Caseous lymphadenitis of sheep and goats

Lecturer Affiliation: College of Veterinary Medicine

Summary:

Etiology

Corynebacterium pseudotuberculosis is a gram-positive bacterium known globally to infect ruminants, and horses.
There are two proposed biotypes, ovine/caprine and equine/bovine, both biotypes produce an exotoxin, and phospholipidase D.

EPIDEMIOLOGY

Geographical occurrence

Caseous lymphadenitis occurs in the major sheep-producing countries in the world including Australia, New Zealand, South
Africa, the Middle East, North and South America, the UK, and most of northern and southern Europe.

Host occurrence

Caseous lymphadenitis occurs in sheep and goats. The disease increases in prevalence with age and reaches a peak incidence in adults. The prevalence rates in goats may be lower than in sheep.

Source of infection

The primary habitat of *C. pseudotuberculosis* is in infected animals. Sources of infection are the discharges from ruptured abscessed superficial lymph nodes and the nasal and oral secretions from animals with pulmonary abscesses draining into the bronchial tree.
The organism can survive in pus-infected soil for up to 8 months, in infected shearing sheds for approximately 4 months, and on straw, hay and other fomites for up to 2 months.

Transmission

Infection of an animal is facilitated by the presence of skin wounds but the organism can invade through intact skin. Transmission is by direct contact with infective discharges or mediated by contaminated shearing equipment, contaminated shearing shed boards or holding pens, contaminated dipping or shower fluids, or dust from contaminated shearing sheds and yards.

Risk factors

- **Age and Sex**

There is a higher prevalence in older sheep, which probably reflects greater exposure to risk factors such as shearing. The prevalence in rams may be related to the fighting behavior with transmission through head wounds.

- **Shearing**

Shearing is a major risk factor in sheep and, in general, infection rates increase with the number of times sheep have been shorn.

- **Dust**

Dust from contaminated yards may transmit infection to recently shorn sheep

- **Housing**

Close contact associated with high stocking rates at pasture or in-door housing for much of the year may lead to high rates of infection.

- **Dips**

The organism can persist in reused or recycled (shower dip) fluids used for ectoparasite control

Economic importance

In the majority of young infected animals there is no overt clinical disease or impairment of health other than visible abscessation but the disease is of considerable economic importance to the sheep and goat industries. Infection is a significant cause of condemnation of carcass for human consumption

Zoonotic implications

Human infection is rare, produces a lymphadenitis with a long and recurrent course

Pathogenesis

Multiple microscopic abscesses develop in the draining lymph node by 1 day after experimental infection in the skin, and between 3 and 10 days of infection these coalesce to form typical pyogranulomas. The sphingomyelin -specific phospholipidase D exotoxin produced by the organism is believed to facilitate spread of infection by promoting leakage of plasma from small blood vessels at the site of infection with flooding of lymphatic spaces. The high lipid content of the bacterial cell wall gives resistance to the digestive enzymes of the phagocyte and the organism persists as a facultative intracellular organism. Hematogenous spread of the

organism results in abscess formation in many organs and these may occur in the absence of peripheral lesions.

Clinical findings:

1. There is palpable enlargement of one or more of the superficial lymph nodes
2. The abscesses commonly rupture and creamy to caseated pus, with no odor, is discharged
3. sheep and goats may also show abscess in the skin, particularly of the face, with loss of overlying hair
4. In cases in which systemic involvement occurs, chronic pneumonia, pyelonephritis, ataxia, and paraplegia may be present depending on the site of infection.
5. In ewes, local spread from the supramammary lymph node to the mammary tissue is common. The resulting fall in milk yields leads to poor growth and even death of lambs

Clinical Pathology:

1. There is an increase in blood lymphocytes and neutrophils
2. *C. pseudotuberculosis* can be cultured from pus obtained by needle biopsy or by transtracheal wash.
3. Serological tests that have been used in serodiagnosis include indirect hemagglutination, hemolysis inhibition, synergic hemolysis inhibition, immunodiffusion and ELISA tests to detect antibody to cell wall antigens or to the phospholipase exoenzyme.
4. ELISA and interferon-gamma assay can be used to detect the disease.

Samples for confirmation of diagnosis:

- Bacteriology - lymph node, lung, culture swab from outer portion of abscess (CULT)
- Histology - formalin-fixed lymph node

Differential Diagnosis:

- Melioidosis
- Tularemia
- Other causes of pneumonia in small ruminants
- Lymphosarcoma (rare)

Treatment:

The organism is susceptible to antibiotics other than the aminoglycoside group but treatment is not usually attempted because the abscess is encapsulated, the organism is intracellular and response is poor. Subcutaneous abscesses can be treated with surgical drainage or extirpation.

Control:

1.Culling
A measure of control can be achieved by culling all animals with enlarged lymph nodes and also, on the basis of serological tests has been used

2. Control of spread
All docking implements, ear taggers, and shears used for the Mules operation should be dipped in strong disinfectant before each use. combs and cutters at shearing time. There should be good hygiene and disinfection in the shearing shed, especially of the shearing board and holding pens

3. Vaccination
Formalin -inactivated *C. pseudotuberculosis* and attenuated mutant vaccines are available