

Septic arthritis and its clinical approaches in cattle

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ABSTRACT

One of the common problems encountered by an Indian animal farmer is mostly the lameness of cattle which could be highly attributed to septic arthritis which can lead to economic loss. Lameness due to joint infection is the second common cause next to lameness due to digit abnormalities or infections. Septic arthritis is the most common infection of synovial structures in cattle, followed by infection of tendon sheaths and synovial bursae. It is caused by the invasion of microorganisms into synovial space. Infection of the joint can be through different ways. Animals are mostly depressed and or presented with acute non-weight-bearing lameness, joint swelling, pain and heat on joint palpation and with or without fever. Early diagnosis is essential for successful treatment of septic arthritis. This article is intended to give a brief outline of septic arthritis and its clinical approaches.

Keywords: cattle, septic arthritis, infection

ETIOLOGY OF SEPTIC ARTHRITIS

Infection of the joint mostly develops through several possible routes, haematogenous route was found to be the most common commonly presented (navel ill in calves) or by indirect infection from a focus nearby or by direct infection through trauma or through arthrocentesis which was found to be the least common. Umbilicosis a very common route of infection in young calves. Inadequate hygiene and disinfection of the umbilicus after birth and failure of transfer of passive immunity are the most important factors contributing to umbilical infection. In adult cattle the hematogenous spread is mostly seen in diseases originating in the postpartum period such as lacerations after forced extraction, retained placenta, endometritis, mastitis, and endocarditis (Margaretten *et al.*, 2007).

Several organisms were found to be the cause of septic arthritis such as *Mycoplasma*, *Lactococcus lactis* (Wichtelet *et al.*, 2003), *Chlamydophila* (Twomey, 2003), *Salmonella typhimurium* (Blake *et al.*, 1997), *Erysipelothrix* species (Dreyfus *et al.*, 1990) and *Streptococcus dysgalactiae* (Ryan *et al.*, 1991).

After the infectious agent enters the synovial space, a severe inflammatory response develops. Bacteria can damage the cartilage or the synovial membrane directly and alter the character of the synovial fluid. Even sometimes severe immunological host response is seen. Inadequate nutrition and enzymatic degradation leads to articular cartilage degeneration resulting in break-down products, which in turn cause synovitis of the particular joint (Van pelt, 1968).

Clinical signs

Septic arthritis is usually characterized by important clinical signs such as severe lameness, distention of the joint, pain on palpation and during passive motion of the affected joint. The animal may or may not have fever and appears dull and appear depressed. Usually only one joint is infected but in calves polyarthritis is seen more commonly than in adult cattle (Rohdeet *al.*, 2000).

DIAGNOSIS

The first basic thing in diagnoses is to observe the animal's stance and the posture. Compare the affected limb to the normal limb to determine obvious swelling, wounds, shifting of weight, and foot posture, such as toe touching or favoured weight bearing on the medial or lateral claw. A combination of clinical findings, radiographic examination, synovial fluid analysis and microbial culture results are necessary to establish a diagnosis (O'Callaghan, 2002).

Radiographic findings show soft tissue swelling, gas accumulation in the joint, widening of the joint space in acute condition or narrowing of the joint space because of articular destruction. Sometimes bony lesions such as osteolytic changes are seen if the infection is persistent for 10 to 14 days.

Arthrocentesis should be carried out for macroscopic and microscopic evaluation of the synovial fluid and bacterial culture. Macroscopic evaluation of the synovial fluid shows higher volume, reduced viscosity, changed colour (yellow, reddish, brown), turbidity, fibrin, and abnormal odour. Other parameters that are analysed are White blood cell count (WBC), percentages of neutrophils (PMN), total protein (TP) concentration and specific gravity. TP concentration > 4.5 g/dl, WBC \geq 25'000 cells/ μ l, percentage of PMN \geq 80% indicate septic arthritis. (Rohdeet *al.*, 2003). The simultaneous use of different culture mediums helps in confirming the infective organism and in choosing the right antibiotic for the treatment. Ultrasound can also be used for diagnosis and is superior to radiography for evaluation of soft tissues (Kofler, 1996).

TREATMENT

The ideal treatment of synovial infection should be focussed on control the infection, removal of bacteria, removal of abnormal joint fluid, control inflammation and restoration of joint function (Nuss, 2011). Surgical removal of an infected umbilicus should be carried out in case of young calves.

In cases that are diagnosed early, parenteral antibiotic therapy can be very effective, bringing about a complete resolution of the joint damage and a return to normal function. Cephalosporins, ampicillin or penicillin in combination gentamicin are a good

choice. IV or IM administration should be preferred to reach higher local minimal inhibitory concentration levels. Systemic antibiotics should be administered for 2-3 weeks after improvement of clinical signs(Nuss, 2011).

Joint lavage is a simple and effective treatment in cases, which have failed to respond to parenteral antibiotic therapy and in animals which would otherwise become permanently crippled. It is an easy to carry out procedure which can be done under general or local anaesthesia. NSAID'S such as Flunixin meglumine (dose of 2.2 mg/kg) and Ketoprofen (3 mg/kg) can be used for effective pain control for a period of two to three days(Jackson, 1999), which reduces the inflammatory response and increases the comfort of the patient. Arthroscopy and arthrotomy are the preferred techniques of treatment in very severe cases.

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