Unusual Presenting Clinical Signs of Mycoplasma bovis Arthritis and Mastitis in a Closed Commercial Dairy Herd

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Introduction

Mycoplasmal infections may cause unusual initial clinical signs or an atypical history. Infection with Mycoplasma spp, typically M. bovis, is an important disease complex of dairy cattle. In addition to mastitis, Mycoplasma spp affect all ages of cattle, and can cause septicemia, arthritis, pneumonia, metritis, agalactia, and death of cattle. The initial clinical signs in dairy herds often include lameness, respiratory tract disease (including pneumonia of calves or adult cattle) and clinical mastitis of multiple quarters (or first in one quarter and subsequently in other quarters), which is often poorly responsive to treatment. In a closed Holstein dairy herd, swelling of the carpal joint, diffuse subcutaneous edema from the carpal to metacarpophalangeal joints, and forelimb lameness were evident in 9 first-lactation cows 7 to 21 days after parturition. New cases were observed over a period of 4 months. There was no reported history of clinical mastitis or respiratory disease in affected animals. Discussion with the owner revealed that 3 affected cows had subsequently died, with pneumonia appearing to be the cause of death, and 3 more had been culled because of nonresponsive clinical mastitis. All 9 affected cows had been treated by IM administration of flunixin meglumine and dexamethasone for 3 days. All cows were nonresponsive to treatment.

Materials and Methods

A first lactation Holstein cow that had exhibited swelling of the carpal joints, diffuse subcutaneous edema extending from the carpal to metacarpophalangeal joints, and forelimb lameness was submitted to the Utah Veterinary Diagnostic Laboratory by the owner of the affected herd. The cow had calved approximately 15 days earlier. The cow died during transit to the diagnostic laboratory. However, the carcass arrived in good condition, and a necropsy was performed. Samples of joint fluid, the spleen, and the lungs from the necropsied cow were tested for Mycoplasma spp by use of PCR. Sequencing reactions were performed at the Utah State University Center for Integrated Biotechnology. Two weeks after necropsy of the affected cow, the referring veterinarian aseptically aspirated joint fluid from one of the remaining affected cows and also obtained a composite milk sample from that same cow. In addition, milk samples were collected from the other 2 remaining affected cows. All 3 cows were then culled. An initial bulk tank milk sample was collected (that sample may or may not have included milk from the 3 clinically affected cows), and 2 additional bulk tank milk samples were collected 3 and 5 days later, respectively. The 2 additional bulk tank milk samples were collected after the 3 affected cows were culled. Samples of joint fluid, composite milk samples from each of the cows, and bulk tank milk samples were frozen and submitted to the Washington Animal Disease Diagnostic Laboratory for mycoplasma culture.

Results

Diagnostic testing revealed that 3 of 3 bulk tank milk samples, 3 milk samples from cows with clinical mastitis, 2 fluid samples obtained from arthritic joints, and samples from the lungs and spleen of the cow at necropsy yielded positive results for Mycoplasma spp. Isolates from the necropsy samples were analyzed for nucleic acid sequence of PCR amplicons (16S to 23S ribosomal RNA gene-spacer region) and this verified Mycoplasma bovis DNA (99% identity with that of a control isolate). Follow-up culture for Mycoplasma spp of milk samples from all lactating cows was recommended to screen for chronic subclinical carriers, but was not performed.

Significance

Delay in diagnosis of mycoplasmal infections in dairy herds can result in substantial financial loss and the establishment of chronic subclinical carriers. When dairy cattle, including those residing in closed herds, display lameness, swelling of the carpal or metacarpophalangeal joints, edema of the distal portions of the forelimbs, or polyarthritis, infection with Mycoplasma spp should be investigated.