Malignant Catarrhal Fever

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Malignant Catarrhal Fever Virus Infection of Domestic Cattle and Other Susceptible Ruminants

The often fatal lymphoproliferative and inflammatory disease syndrome malignant catarrhal fever (MCF) is caused by closely related members of the family Gammaherpesvirinae. Two epidemiologic entities of the disease exist: wildebeest-associated MCF (WA-MCF), an endemic subclinical infection in antelope of the Alcelaphine subfamily, and sheep-associated MCF (SA-MCF), an inapparent MCF virus (MCFV) infection of sheep. The MCFV of WA-MCF has been isolated, well characterized and named alcelaphine herpesvirus (AHV-1). The MCFV assumed to infect sheep has never to our knowledge been isolated. However, exposure to sheep has frequently been associated with outbreaks of MCF in cattle worldwide. Furthermore, MCFV DNA sequences have been demonstrated in sheep tissues and MCFV antibodies have been shown in sheep by CI-ELISA. Thus, it is virtually certain that sheep are important carriers of MCFV.

Competitive Inhibition Enzyme-Linked Immunosorbent Assay for Antibody in Sheep and Other Ruminants to a Conserved Epitope of Malignant Catarrhal Fever Virus

Neither the pathogenesis nor the epidemiology of SA-MCF is well understood because the etiologic agent has not been isolated from sheep and because an MCFV-specific antibody test has not heretofore been available. A monoclonal antibody, 15-A, has been identified, characterized and adapted to a CI-ELISA.

Monoclonal antibody 15-A has been shown to react with four different isolates of MCFV. Rabbit, sheep, calf, deer and wildebeest antibodies to various MCFV strains including both wildebeest- and sheep-associated strains all strongly inhibited binding of 15-A to its epitope in the CI-ELISA. Furthermore, 15-A did not react with 13 common sheep, goat, and cattle viruses nor did antisera to these viruses inhibit in the CI-ELISA.

Among 149 samples from sheep associated with outbreaks of MCF in seven states, the sensitivity of the CI-ELISA was comparable to immunofluorescence (83% concordance). It is assumed that most, if not all, of the immunofluorescence positive/CI-ELISA negative samples were due to cross-reacting antibodies to other ruminant herpesviruses. There were no samples positive by CI-ELISA and negative by immunofluorescence (100% specificity).

Reference: Li, H., et al., J. Clin. Microbiol., 32:1674-1679, 1994.