Evidence of Bovine Viral Diarrhea Virus Persistent Infection in Two White-Tail Deer in Southeastern South Dakota

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Introduction

The role of wildlife reservoirs continues to be a major unknown in the epidemiology of bovine viral diarrhea virus (BVDV). Serological data indicates that a wide range of wild ruminants have BVDV antibodies. BVDV has been isolated from a mule deer in Wyoming. In this report we examine the gross, histological and virological findings of two isolations of BVDV in white-tail deer in southeastern South Dakota in areas with concentrations of feedlot, dairy and cow-calf operations.

Materials and Methods

Two white-tail deer were submitted to the Animal Disease Research and Diagnostic Laboratory in the fall of 2003 by the South Dakota Game Fish and Parks for chronic wasting disease (CWD) testing. Both animals were CWD negative. The first deer was submitted in October and was in good body condition. The second animal was submitted in December and was the past year's fawn, and was in poor body condition. The animals were necropsied and histopathology, viral antigen detection and virus isolation were performed. In addition the BVDV isolates were typed using polymerase chain reaction in both the Erns region and the 5'NCR.

Results

The first deer had no remarkable gross lesions indicative of BVDV. There was an abscess in one lung. The BVDV-FA test on the lung was negative. A noncytopathic (NCP) BVDV was isolated from the lungs and the intestine. The ear notch was immunohistochemistry positive for BVDV antigen. The isolate was typed in the Erns region and was a BVDV genotype 2. 5'NCR indicated that it was a type 2a. The second animal was unthrifty and stunted. The animal had a gun shot wound and had multifocal mandibular abscesses and diarrhea. Necropsy of this animal revealed multifocal ulcers of the abomasum. Histologically, the animal had lymphoid depletion of the spleen. The animal was FA-positive for BVDV antigen, and a NCP virus was isolated from the kidney, abomasum and lung. Immunohistochemistry indicated the presence of BVDV antigen in the skin and all tissues tested. The virus was typed in the Erns region, and was a BVDV genotype 1. Further genetic in the 5'NCR indicated the virus was a type 1b.

Significance

This report is significant because it is the first report of possible persistent infection in deer. This would represent a serious problem for any cattle operation with deer contact. The implications of these BVDV isolations on biosecurity and prevention programs are alarming as the white-tail deer reservoir represents a huge risk to cattle. This is the third report of BVDV in deer in North America, and the first report of multiple isolations of both genotypes.