

Emerging Infections

547 Reinfection, oral exposure and immunity to Schmallenberg virus in cattle

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Question: In late 2011, Schmallenberg virus (SBV), an orthobunyavirus was discovered near the German-Dutch Border and spread rapidly to other European countries. Immunity in convalescent animals, the possibility of oral infection and the immune status after natural infection had to be investigated.

Methods: In this study, two previously infected heifers and five SBV antibody-negative calves were subcutaneously inoculated; another two animals received SBV orally. Whole blood and serum samples were taken regularly and lymphocytes from peripheral blood (PBL) were separated. The nostrils, oral cavity and rectum were swabbed and a diverse panel of tissue samples was taken at necropsy.

Results: After inoculation, viral RNA was detected in serum and blood samples of the naive cattle for several days. The seropositive animals remained negative throughout the study. Oral instillation of SBV did not lead to infection. Viral RNA was detected in faecal, oral and nasal swabs taken from some naive animals post inoculation. Immunological tests demonstrated that SBV did not replicate in bovine PBL but influenced the lymphocyte homeostasis in blood. Viral RNA persisted in the lymphoreticular system for at least 5 weeks after infection.

Conclusions: The animal experiment showed that only subcutaneous exposure of the naive animals to SBV led to infection, while seroconverted animals could not be re-infected. Viral RNA persisted in the lymphoreticular system, but was not present in PBL.

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