One Health: connecting human and animal health

Solving RSV issues in kids and calves

Wageningen Bioveterinary Research

Safeguarding human and animal health through veterinary and biomedical research

WAGENINGEN UNIVERSITY & RESEARCH

RSV in kids and calves

RSV (Respiratory Syncytial Virus) is one of the main causative agents in bovine respiratory tract disease (BRD) and has been studied for decades at the Wageningen Bioveterinary Research, in the Netherlands. Classical bovine RSV (bRSV) infections can be reproduced in our calf model, which creates possibilities to study disease pathogenesis, host-pathogen interactions, and mechanisms of protection or enhancement after vaccination, infection or treatment of the disease.

In the model both the classical bRSV infection and the vaccine-enhanced immunopathology have been reproduced. This makes it suitable for the evaluation of both vaccine efficacy and vaccine safety. The options to prevent or treat RSV-related disease in humans are at present limited. Our model could help in the development and selection of intervention strategies.

Clinical infection in humans

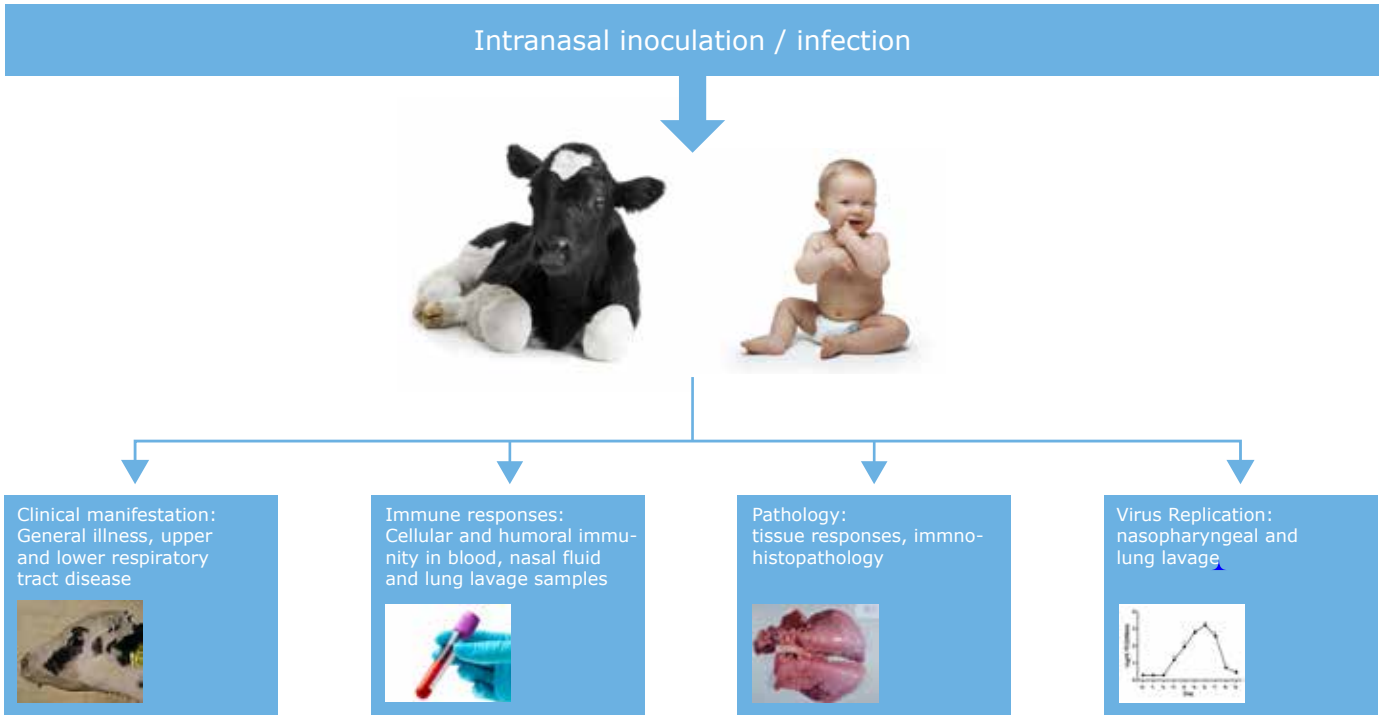
RSV infection most commonly causes a cold-like illness, starting with a runny nose followed by coughing. Infection of the lower respiratory tract might result in bronchi(oli)tis and/or pneumonia accompanied with obstruction of the smaller airways and is characterized by (severe) tachypnoea, chest retractions and sometimes wheezing. Severe, life-threatening lower respiratory tract infections are mostly seen during primary infections in young kids.

Clinical infection in calves

In calves, bovine RSV infection usually starts with signs of an upper respiratory tract infection, including nasal discharge. During course of infection, symptoms of the lower respiratory tract develop, characterized by (severe) dyspnoea and commonly accompanied with depression and fever. Peak of clinical disease is observed between day 7 and 9 post inoculation.

Summary

CVI's bovine RSV calf model is a homologous, predictive animal model, an clearly displays a clinical disease very similar to human RSV infection in children. This allows the model to be used as a non-human animal model for the better understanding of the human disease process. The model has proven to be a robust model for studying RSV pathogenesis and evaluating efficacy and safety of RSV candidate vaccines and therapeutics.



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