

TITLE

H1N1PDM09 INFECTION IN PIGS – SUBCLINICAL BUT IMMUNOLOGICALLY RELEVANT

Charlotte Schröder¹, Theresa Schwaiger¹, Alexander Schäfer², Julia Sehl¹, Claudia Karte³, Bernd Köllner², Thomas C. Mettenleiter⁴, Reiner Ulrich¹, Ulrike Blohm²

¹ *Department of Experimental Animal Facilities and Biorisk Management, Friedrich-Loeffler Institute, Greifswald*

² *Institute of Immunology, Friedrich-Loeffler Institute, Greifswald*

³ *Institute of Diagnostic Virology, Friedrich-Loeffler-Institut, Greifswald*

⁴ *Institute of Molecular Virology and Cell Biology, Friedrich-Loeffler-Institut, Greifswald*

CONTENT

Background and Objectives

Intensive pig husbandry offers optimum transmission conditions for pathogens. Especially undetected influenza A virus (IAV) infections cause immense financial losses in pig production and poses a risk to human health. Correlation of clinical signs and pathological parameters with hematological data during experimental H1N1pdm09 infection might identify subclinical influenza infections in pigs.

Material and Methods

Twenty-six German landrace piglets (seven weeks old) free from acute H1N1 infection and corresponding antibodies were infected twice (second infection at day 21 after first) intranasally by mucosal atomization device with IAV A/Bayern/74/2009 (H1N1pdm09). Three non-infected animals served as controls. Every day, behavior and clinical signs were scored and body temperature was assessed. Viral load in nasal swabs and counts of white blood cells were determined on following days after infection (dpi): 2, 4, 7, 14, 21, 22, 25 and 31. Necropsies were performed on day 4, 7, 21, 25 and 31 pi.

Results

Pigs did develop neither fever nor clinical signs related to infection with H1N1pdm09. Viral shedding started at day 2 pi in 60% of infected animals, peaked at day 4 and was cleared until day 7 pi. During necropsies, macroscopic influenza-associated lung lesions were detected on day 4 and 7 pi. Immunohistochemistry confirmed IAV M protein on day 4 pi in the lungs and ongoing infiltration of leukocytes starting on the same day. Blood counting device revealed increased numbers of monocytes on day 4 pi and decreased lymphocyte count until day 14 pi. After second infection, lymphocyte count increased in blood.

Discussion and Conclusion

Although pigs were clinically inapparent, IAV infection occurred in the lungs. The immune response was characterized by decreasing numbers of lymphocytes in blood und subsequent influx of leukocytes in the lungs, confirming ongoing inflammatory processes. Increased lymphocyte count after second infection indicates a memory response.