RESEARCH ABSTRACT

SWINE HEALTH

Title: Senecavirus A in sows: Impact of transportation stress on early development of vesicular lesions, transmission and recurrence of clinical disease in persistently-infected animals – **NPB #17-215**

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Scientific Abstract

Senecavirus A (SVA) has been responsible for significant concern on the swine industry worldwide due to the similarities with other vesicular diseases, especially foot-and-mouth disease. The clinical identification of vesicular lesions in pigs triggers a foreign animal disease investigation, demanding time and resources for diagnostics and causing logistical problems for hog farmers and packing plants. Vesicular lesions are commonly detected in finishing pigs and sows after arrival at packing plants while often going undetected in the farms or buying stations. A hypothesis to explain these events and new outbreaks in sow farms is the potential persistence of the virus in the tonsil of infected animals after recovering from the clinical disease, and a possible effect of transportation stress on transmission and reoccurrence of lesions. The goal of the present study was to evaluate the ability of SVA infected animals to transmit the virus in three different stages of disease progression through direct contact with naïve animals after transportation stress. In addition, reoccurrence of vesicular disease and shedding of SVA after transportation stress in asymptomatic carrier animals was assessed. Eighteen gilts were allocated in four groups: SVA stressed (n=4), naïve-contact day 7 (n=4), naïve-contact day 21 (n=4), naïve-contact day 35 (n=4) and control (n=2). SVA stressed animals were inoculated intranasally with $2.7x10^8$ $TCID^{50}$. Naïve-contact animals were comingled with infected seeders on 7, 21 and 35 days post-inoculation (dpi) and kept in the same pen for 12 days until necropsy. Simulation of transportation stress was done on SVA stressed group using an experimental model based on National Pork Board's guidelines regarding temperature, space and feed and water restriction, with a duration of 8 hours. To mimic weather conditions in summer, the temperature of the room was raised to induce a low level of heat stress. To assess the effect of transportation stress in all timepoints, the transport model was performed in a manner that the end of the 8 hours coincided with the arrival of the naïve-contact animals on days 7, 21 and 35. Monitoring of viremia, serological IgG response and viral shedding by oral swabs, fecal swabs and tonsil swabs at 2, 5, 7, 9, 12 dpi or contact with infected seeder pigs was performed by RT-qPCR and IFA, and monitoring for clinical signs was performed daily. Infected seeder pigs were monitored on 14, 21, 28, 35, 42 and 49 dpi. Transmission occurred to naïve-contact animals from day 7, with 4/4 animals showing viremia on day 5 post-contact. All naïve-contact comingled at day 7 had positive IFA results 9 days post-contact. All SVA-stressed animals were shedding 7 dpi, but only 1/4 seeder and 0/4 were shedding 21 and 35 days post-inoculation, respectively. Vesicles were detected in 2/4 of inoculated animals on days 4 and 5 post-inoculation, and reoccurrence of lesions did not happen after any mock transportation procedure. In conclusion, stress appeared not to be determinant on SVA transmission, and the decrease of fecal shedding in SVA-stressed animals over time coincides with the lack of transmission to naïve animals as they were put in contact on days 21 and 35.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

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