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EVALUATION OF AEROSOL TRANSMISSION OF *MYCOPLASMA HYOPNEUMONIAE* AND PORCINE REPRODUCTIVE AND RESPIRATORY SYNDROME VIRUS (MIXED INFECTION) UNDER FIELD CONDITIONS

Eduardo Fano[1]; Carlos Pijoan[1]; Scott Dee[1]
[1]Department of Clinical and Population Sciences, University of Minnesota, St. Paul, MN

Introduction

Indirect transmission of *Mycoplasma hyopneumoniae* and detection of the agent in air from infected barns have been documented[1], but many questions on the field relevance of aerosol transmission remain unanswered. In PRRSV, the role of aerosol transmission is unclear. It has been documented that PRRSV can spread over distances of 1 mt under experimental conditions[2]. Several attempts have been done in order to produce aerosol transmission under field conditions, but they have been unsuccessful [3]. Several factors such as size of the infected population, gas, dust, levels of humidity, fluctuating temperatures and concurrent infections may be involved.

M. hyopneumoniae potentiation of PRRSV has been demonstrated[4], but it is not known if this can increase the probability of viral transmission. The objectives of this study were to evaluate the transmission of *M. hyopneumoniae* and PRRSV by aerosol both as a single or as a mixed infection

Materials and Methods

A total of 60,2 month-old PRRSV and *M. hyopneumoniae* negative pigs were placed in an 11- pen mechanically ventilated finishing building. 28 pigs were inoculated intratracheally with *M. hyopneumoniae* on day 0 and infected intranasally with a field isolate (MN-30100) of PRRSV on day 35. The remaining animals were not inoculated and used as both direct contact (12) and indirect contact controls (20). In order to assess the aerosol transmission of *M. hyopneumoniae* as a single infection, on day 28 post-inoculation (pi), 1 trailer (A) containing 10, 5 week old sentinels pigs was placed along (1 m from the fans) the south side of the building. On day 42, 1 week after the PRRSV infection (mixed infection assessment) two trailers (B and C) also containing 10 negative 5 week-old pigs each, were placed along each side of the barn. Trailer B was located along the infected barn (1 m from the fans). Trailer C was placed 6 m. from the fans on the other side of the barn (north). A tube (PBC pipe with 10 cm of diameter) was connected from the exhaust fans into this trailer. The sentinel pigs located in the 3 trailers were exposed to the barn air exhaust for seven days.

During the exposure period, air samples were collected using an all-glass impinger, in order to determine if *M. hyopneumoniae* or PRRSV could be detected by PCR in air from both inside or outside the infected barn. Following this exposure period, pigs from each trailer were moved to separate rooms in a building approximately 30 mt from the infected barn and held for 21 days, at which time they were sent to the diagnostic laboratory. The *M. hyopneumoniae* and PRRSV status was monitored for the 28 days of the trial by PCR and serology.

Results and Discussion

Transmission of *M. hyopneumoniae* and PRRSV was detected in both direct and indirect contact controls housed inside the barn by ELISA and PCR. *M. hyopneumoniae* infection was not detected in sentinels pigs from trailer A, but it was detected in sentinels pigs from trailers B and C. *M. hyopneumoniae* was also detected by N-PCR in air samples collected from both inside and outside the barn (fans). PRRSV was not detected in sentinels pigs from trailers B or C or from any air samples. One explanation for the failed attempt in transmitting *M. hyopneumoniae* as a single infection, could be that at day 28 pi the levels of the agent in the air were not enough to induce aerosol transmission, even though it was detected from the air sampling. Alternatively, the positive air transmission could be the result of the dual infection. In conclusion, this study confirms the hypothesis of aerosol transmission of *M. hyopneumoniae*. The study also confirms that airborne transmission of PRRSV is probably an infrequent event, even when mixed infections are present.

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