Relationship of microscopic lesions and viral load in fetal implantation sites for type 2 PRRSv infected pregnant gilts

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Introduction

Porcine reproductive and respiratory syndrome (PRRS) continues to be the most costly diseases facing the North American swine industry resulting in reproductive losses estimated to be over $500 million annually. However, after nearly 25 years of PRRS research, the pathogenesis of fetal death during infection is still poorly understood. In most of the cases of abortions associated with late gestation infections of PRRSv, microscopic lesions in the internal organs of the fetuses are rare and inconsistent. This suggests that fetal death might not be a consequence of PRRS virus replication in the internal organs, but that fetal implantation sites may play an important role in the pathogenesis of fetal death. The objective of this study is to determine whether PRRSv RNA levels in endometrium correlate with microscopic lesions present in the fetal implantation sites of pregnant gilts infected with type 2 PRRSv.

Material and methods

- 113 PRRSv-naive pregnant gilts were intramuscularly and intranasally inoculated with PRRSv (10⁶ TCID₅₀ total dose) and 19 negative control gilts were sham inoculated on gestation day 85±1
- 21days post inoculation, dams and their litters were humanely euthanized for necropsy examination
- Histopathology of the uterus and placenta for all fetuses was assessed by pathologists blinded to PCR results
- Scoring scheme included the assessment of uterine and blood vessel inflammation
- The severity of the inflammation in the uterus was assessed based on percentage of affected endometrium and total number of inflammatory cell present in the lamina propria
- The degree of vasculitis was assessed based on its distribution and severity in the endometrial tissue

Results and Discussion

- 679 uterine tissue sections randomly selected from 110 infected pregnant gilts were microscopically examined
- No signs of uterine infection or vasculitis were found in negative control gilts
- 73% of uterine tissue samples exhibit severe lymphohistiocytic endometritis (grade 3) and very severe for an additional 10% of tissue sections (grade 4).
- Endometrial inflammation expressed as total number of inflammatory cell present in the lamina propria was positively related to distribution and severity of vasculitis in the endometrium (P<0.001; Multilevel Mixed-Effect Model, STATA).
- No significant relationship between endometrial inflammation and PRRS viral loads in uterus (P=0.4059; Multilevel Mixed-Effect Model, STATA).
- Percentage of vessels affected with vasculitis and average severity score of vasculitis were not significantly related to PRRS viral loads in the uterus (P=0.4147, P=0.6425, respectively; Multilevel Mixed-Effect Model, STATA)

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References


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