Introduction

Porcine circovirus type 2 (PCV2) has been associated with a number of disease manifestations in pigs including reproductive failure (1). It has been demonstrated that PCV2 can be transmitted horizontally and vertically; however, it is unclear to what extent vertical PCV2 transmission occurs under field conditions especially in farms subclinically infected with PCV2. The objective of the current study was to evaluate the rate of intrauterine PCV2 infection in healthy piglets born on commercial farms in North America and to further characterize dam viremia, dam antibody levels, and piglet antibody levels.

Materials and Methods

Five commercial breeding herds were selected to participate in this study, with one farm located in Mexico (Farm A) and the remaining four farms located in the U.S. (Farms B-E). A total of 128 clinically healthy sows and 504 live-born normal appearing piglets born to the dams were randomly selected at a rate of three to four piglets per litter. Serum and colostrum samples of the dams were collected immediately after parturition and before suckling. Piglet serum samples were collected after birth and prior to colostrum uptake. All samples were tested for the presence of anti-PCV2 IgG antibodies using a PCV2 ORF2-based ELISA (2) and for the presence and amount of PCV2a and PCV2b DNA by a multiplex differential real-time PCR (3).

Results

All (128/128) dams and 21.2% (107/504) of the piglets were positive for anti-PCV2 IgG antibody. The overall PCV2 DNA prevalence was 66.4% (85/128) in dams and 43.1% (217/504) in piglets. In general, more dams and piglets were positive for PCV2b (71.8 and 75.1%, respectively) compared to PCV2a (12.9 and 15.1%, respectively). Concurrent PCV2a/b infection was detected in 13/128 dams and in 21/504 piglets on all five farms. Piglets born to dams with higher PCV2 DNA loads had increased frequency of PCV2 viremia and elevated PCV2 DNA copy numbers in serum. Higher amounts of PCV2 DNA were detected in PCV2 seronegative piglets compared to seropositive piglets indicating that some level of protective humoral immunity developed in utero.

Discussion

Vertical transmission is an important means of PCV2 transmission in clinically normal herds. In the selected farms, PCV2b was more prevalent than PCV2a in piglets, and virus transmission through breeding herds may result in continuous PCV2b exposure to grow-finish herds. Dam viremia was associated with the frequency and level of PCV2 infection in the piglets. The piglet anti-PCV2 antibody could alleviate PCV2 infection, indicating humoral immune responses occurring in the fetuses may play a protective role. Dam PCV2 antibodies did not necessarily alleviate PCV2 infection in fetuses.

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References