Vertical transmission of PCV2b to fetuses in sows intramuscularly infected with PCV2b

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Abstract

In order to investigate whether PCV2b can be transmitted across the placenta in sows thereby causing vertical infection of fetuses, six sows in 75 day of pregnancy were either intramuscularly inoculated with a PCV2b culture supernatant (n = 4) or mock infected with cell culture supernatant (n = 2). At parturition, 3 newborn piglets from each litter were randomly selected and euthanatized prior to suckling. Samples of the mesenteric lymph nodes, spleens, kidneys, hearts and lungs were collected for PCR, histopathological and immunohistochemical assays. The results showed that the newborn piglets from PCV2b-infected sows had histopathological lesions in the tested tissues. Moreover, PCV2b antigen and DNA were detected as well. These findings therefore suggested that porcine circovirus type 2b can be transmitted across the placenta of sows, thereby leading to PCV2b vertical infection of the fetuses.

Key words: porcine circovirus type 2, vertical transmission, PCV2 infection in fetuses

Introduction

Porcine circovirus type 2 (PCV2) is a tiny DNA virus belonging to the Circoviridae family. Two members of nonpathogenic PCV1 and pathogenic PCV2 have been identified so far. PCV2 had been regarded as the main causative agent of postweaning multisystemic wasting syndrome (PMWS) in pigs since the late 1990s in Canada, USA and Europe (Allan et al. 1998, Ellis et al. 1998). PCV2-associated reproductive failure is a broad term in breeding pig farms, and has become one of hot topics of PCV2 investigations. For instance, Sarli et al. (2012) reported that reproductive failure could be experimentally induced in sows via artificial insemination with PCV2b spiked semen. Likewise, PCV2 transmission through sows’ placenta using PCV2 intrauterinely injected into pregnant sows was also reported in previous study (Yoon et al. 2004). Furthermore, transplacental infection by PCV2 under field condition was proved by another study (de Castro et al. 2012). Vertical transmission of PCV2b in female Kunming mice was confirmed in our previous studies by 2 different ways (Deng et al. 2013a, 2013a,b). The first was performed in pregnant mice intraperitoneally inoculated with PCV2b and the second was conducted in female mice artificially inseminated using PCV2b-spiked semen. Similar results were obtained from both groups, as PCV2b was detec-