The Immune Response of Pigs in Foot and Mouth Disease outbreak farm: The Case Study

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Introduction

Foot and mouth disease (FMD) is considered the most contagious disease of livestock. Essentially all cloven footed species are susceptible to foot and mouth disease virus (FMDV) (Pfeiffer, 1993). Seven serotype of FMDV have been identified by cross protection and serological test including type A, O, C, Asia 1 and South African Territories (SAT) 1,2 and 3 (Murphy,1999). After in vaccination or infection of FMD virus, the immune response against FMD virus plays role in the protection mechanism (McCullough, et,al, 1992). The objective of this study was to reveal the humoral-mediated immunity (HMI) and cell-mediated immunity (CMI) responses against FMDV of pig in FMD outbreak farm.

Materials and Methods

The pig serum samples, from the FMD outbreak farm in Lamphun province, Thailand, were collected to detect the antibody titer by LP-ELISA assay (Regional Reference Laboratory of Foot and Mouth Disease in South East Asia, 2005). The whole blood samples were also collected in ACD tube to detect the CMI response by lymphocyte proliferation (LP) assay (Suphavilai, Looareesuwan, and Good, 2004). The serum samples were collected since 12 days after first case was detected and the last samples were collected 49 days after the infection. The CMI detection was done 8 months after the infection.

Results

This farm was small pig farms with 106 sows, 2 boars, 55 suckling pigs and 375 nursery pigs. The first case was detected on October 14th 2009. The farmer reported the authorities' veterinarian on 12 days later. The tissue samples were sent to Regional Reference Laboratory of Foot and Mouth Disease in South East Asia and the FMD virus serotype O was detected.

The antibody titer against FMDV type O of sow was high even in 7th week after infection (more than 640). At the 8 months after the outbreak, mort than 50% of sample had high LP response.

The piglets, which born from the infected sows and born after the outbreak, had highly antibody titer since the 1st week of age. The titer was dramatically reduced after that. Until the 8th week of age, more thn 50% of sample had the protection titer (>80).

The farmer vaccinated the non-clinical sign nursery pigs in the farm with the trivalent vaccine at the 21st and booster at the 35th day after the 1st case was detected. The mean titer was lower than the protective level (<80) before the booster. Afterward, the titer was increased more the lowest protection level. At the 8th month after outbreak, the nursery pigs, at that time, was showed non LP response.

Discussion

The antibody titer of sow was prolonging more than 7 weeks after the infection and the CMI response might protect the sow from FMDV infection until the 8th month after the outbreak. However, the vaccination should be done after the 6th month after the outbreak for maintain the protection level of the antibody titer.

The piglet, which born from the infected sow should vaccinate at the 8th or 10th week of age to avoid neutralizing reaction of maternal antibody and vaccine antigen.

During the outbreak period, the vaccination could be done with the non-clinical sign pigs. However, the pigs should be vaccinated 2 times; the 2nd time is the booster. The antibody level after the booster could protect the FMDV infection.

References

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