Sattler et al. Porcine Health Management (2015) 1:19
DOI 10.1186/s40813-015-0015-9

Porcine Health Management

RESEARCH Open Access

Performance of ELISAs for detection of antibodies against porcine respiratory and reproductive syndrome virus in serum of pigs after PRRSV type 2 live vaccination and challenge

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Abstract

Background: The aim of the study was to evaluate the performance of different newly developed and/or commercially available ELISAs for detection of PRRSV specific antibodies. Consequently, ten PRRSV negative piglets (group V) were vaccinated with a PRRSV type 2 vaccine. Blood samples were taken before as well as seven, 21 and 42 days after vaccination. At day 42 after vaccination (day 0 of the study) all of the piglets from group V and 10 non-prevaccinated PRRSV negative piglets (group N) were challenged with an HP PRRSV type 2 field strain. Blood samples were taken before and at days 3, 7, 10, 14, 21 and 28 after challenge. The success of vaccination and challenge was measured with RT qPCR. All serum samples were tested with six ELISAs for detection of PRRSV antibodies. Three of them are nucleocapsid-based, two use a glycoprotein extract and one uses inactivated whole virus as antigen. The specificity of the ELISAs was evaluated using 301 serum samples of piglets from PRRSV negative herds.

Results: The piglets from group V tested positive by RT qPCR at day 7 after vaccination and all piglets tested positive at day 3 after challenge. PRRSV specific antibodies were seen with all nucleocapsid-based ELISAs from day 21 after vaccination onwards in group V and from day 10 after challenge in group N. The glycoprotein-based ELISAs detected antibodies from day 42 after vaccination (group V) and day 21 after challenge (group N). The agreement according to kappa-coefficient was almost perfect. The glycoprotein-based ELISAs were able to distinguish PRRSV type 2, although with some cross reactions. Regarding specificity, the ELISAs performed differently (specificity between 97.4 % and 100 %), whereas most of the ELISAs with higher sensitivity had a slightly lower specificity.

Conclusions: All tested ELISA were able to detect PRRSV antibodies in the serum of pigs vaccinated with a PRRSV type 2 vaccine and after challenge with an HP PRRSV type 2 field strain. The onset on antibody detection differed, depending on the type of antigen used in the ELISAs. Most of the ELISAs with a higher sensitivity had a lower specificity.

Keywords: Swine, Highly pathogenic, Sensitivity, Specificity, Agreement

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