

RESEARCH ARTICLE

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Impact of maternally derived immunity on piglets' immune response and protection against porcine circovirus type 2 (PCV2) after vaccination against PCV2 at different age

Paolo Martelli^{1*}, Roberta Saleri¹, Giulia Ferrarini¹, Elena De Angelis¹, Valeria Cavalli¹, Michele Benetti¹, Luca Ferrari¹, Elena Canelli¹, Paolo Bonilauri², Elena Arioli³, Antonio Caleffi³, Heiko Nathues⁴ and Paolo Borghetti¹

Abstract

Background: This study was aimed at evaluating the clinical protection, the level of *Porcine circovirus* type 2 (PCV2) viremia and the immune response (antibodies and IFN- γ secreting cells (SC)) in piglets derived from PCV2 vaccinated sows and themselves vaccinated against PCV2 at different age, namely at 4, 6 and 8 weeks. The cohort study has been carried out over three subsequent production cycles (replicates). At the start/enrolment, 46 gilts were considered at first mating, bled and vaccinated. At the first, second and third farrowing, dams were bled and re-vaccinated at the subsequent mating after weaning piglets. Overall 400 piglets at each farrowing (first, second and third) were randomly allocated in three different groups (100 piglets/group) based on the timing of vaccination (4, 6 or 8 weeks of age). A fourth group was kept non-vaccinated (controls). Piglets were vaccinated intramuscularly with one dose (2 mL) of a commercial PCV2a-based subunit vaccine (Porcilis[®] PCV). Twenty animals per group were bled at weaning and from vaccination to slaughter every 4 weeks for the detection of PCV2 viremia, humoral and cell-mediated immune responses. Clinical signs and individual treatments (morbidity), mortality, and body weight of all piglets were recorded.

Results: All vaccination schemes (4, 6 and 8 weeks of age) were able to induce an antibody response and IFN- γ SC. The highest clinical and virological protection sustained by immune reactivity was observed in pigs vaccinated at 6 weeks of age. Overall, repeated PCV2 vaccination in sows at mating and the subsequent higher levels of maternally derived antibodies did not significantly interfere with the induction of both humoral and cell-mediated immunity in their piglets after vaccination.

Conclusions: The combination of vaccination in sows at mating and in piglets at 6 weeks of age was more effective for controlling PCV2 natural infection, than other vaccination schemas, thus sustaining that some interference of MDA with the induction of an efficient immune response could be considered. In conclusion, optimal vaccination strategy needs to balance the levels of passive immunity, the management practices and timing of infection.

Keywords: *Porcine circovirus* type 2 (PCV2), Vaccine efficacy, Protection, Immune response

* Correspondence: paolo.martelli@unipr.it

¹Department of Veterinary Science, University of Parma, Via del Taglio, 10 - 43126 Parma, Italy

Full list of author information is available at the end of the article

