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НАРВАК

ФГБНУ ВСЕРОССИЙСКИЙ НАУЧНО-ИССЛЕДОВАТЕЛЬСКИЙ ИНСТИТУТ ЭКСПЕРИМЕНТАЛЬНОЙ ВЕТЕРИНАРИИ имени Я.Р. КОВАЛЕНКО

Effect of colostral immunity on the antigenic activity of the "VERRES-CIRCO" vaccine and distribution of IgG/IgM after challenge of pigs with PCV2

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Introduction

Vaccination against PCVD is widely practiced, two principal consequences being the possibility of colostrum-derived antibodies affecting post-vaccination immunity and the need to be careful when interpreting the results of diagnostic tests, especially if antibody levels are measured.

The present article looks at the influence of colostral immunity to PCV2 on the formation of post-vaccination immunity. Another goal was to determine the dynamics of anti-PCV2 antibody detection depending on vaccination schemes.

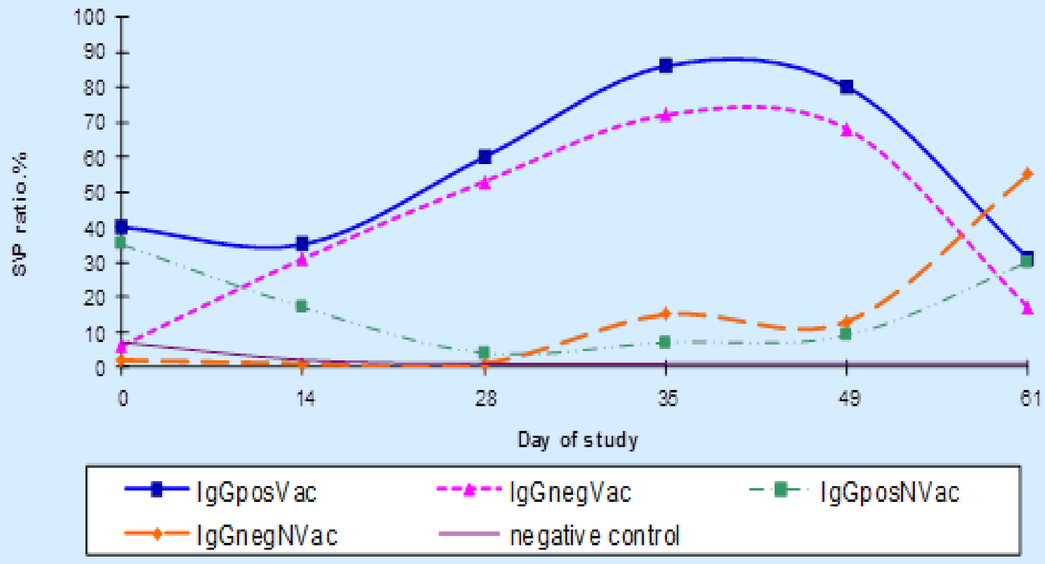
Table 1. Experimental design

Group #	IgG PCV2 at day 0	Vaccination on the day 0	Challenge on day 35
IgGposVac	+	+	+
IgGnegVac	-	+	+
IgGposNVac	+	–	+
IgGnegNVac	-	–	+
negative control	-	–	–

Results

Vaccination of seropositive pigs did not induce production of IgM-antibodies, but led directly to an increase of the IgG concentration, which was typical for secondary immune response. Vaccination of seronegative animals induced production of IgM and then, following isotype switching, of virus-specific IgG. Similar results were obtained after experimental challenge of piglets. Production of post-challenge IgM only took place in piglets that had been seronegative initially or in piglets after the complete disappearance of colostral antibodies. Challenge of seropositive piglets only resulted in a quantitative change of IgG concentration. Despite the presence of IgG at the moment of vaccination, the level of IgG after vaccination did not alter.

Figure 1. Levels of PCV-2 specific IgG in 4 experimental and control (c) groups by ELISA. The cut-off S/P level for positive samples was above 20%.



Conclusions and Discussion

Detection of virus-specific IgG and DNA of PCV2 using ELISA and PCR, remains the most commonly used approach for laboratory diagnosis of PCVD in Russia.

Results obtained in this study indicate that the presence of maternally-derived antibodies does not interfere with the formation of strong vaccine-induced immunity. We also conclude that it is important not only to test samples for IgG and viral DNA presence, but also to assess IgM levels to understand a given herd's PCV2 and PCVD status.

Table 2. Presence of PCV-2 specific IgM throughout the experiment

Group #	Day of study					
	O	14	28	35	49	61
IgGposVac	–	–	–	–	–	–
IgGnegVac	–	+	+	–	–	–
IgGposNVac	–	–	–	–	+	+
IgGnegNVac	–	–	–	–	+	+

Materials and Methods

In the present study we used a group of clinically healthy 3-week-old piglets whose peripheral blood was free of PCV2. The study was carried out at the All-Russian Research Institute of Experimental Veterinary Medicine. On the basis of the presence or absence of IgG-antibodies, the animals were divided into 4 experimental groups (n=6) (see Table 1). The "VERRES-CIRCO" subunit vaccine was used for immunization. PCV2 used as a challenge had been isolated from a pig with PMWS and propagated in the "TM 2014" porcine alveolar macrophage cell culture. The infectious activity of the virus was 104,0TCID50/ml. Detection of PCV2 DNA and anti-Cap PCV2 IgG/IgM in pig serum samples was performed using a commercial PCR kit and a commercial ELISA kit, respectively.

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