"VACCINATION WITH UNISTRAIN® PRRS IN PIGLETS REDUCES VIRAEMIA AND EXCRETION OF PRRSV AFTER A HETEROLOGOUS CHALLENGE WITH A UK STRAIN"

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INTRODUCTION

After a PRRSV challenge, prolonged viraemia and shedding increase the possibility of transmission of the PRRS virus. The amount of virus shed, together with the duration of the shedding, contributes to the spread of PRRSV within and between pig farms. Therefore, the reduction in viraemia and excretion using vaccines is essential to control PRRS disease. The aim of this study was to demonstrate that vaccination of piglets with UNISTRAIN® PRRS better controls viraemia and reduces virus shedding after a heterologous PRRSV challenge.

MATERIALS AND METHODS

Seventy 3-week-old piglets, clinically healthy and free from virus and antibodies against PRRS were randomly assigned to a vaccinated group (n=35) and a control group (n=35). The animals in the vaccinated group were immunised intramuscularly with UNISTRAIN® PRRS (2ml/dose; $10^{3.5}$ $CCID_{50}$/animal) and the animals in the control group received 2 ml of PBS using the same strategy as in the vaccinated group. At 8 weeks of age, all piglets were challenged intranasally with a heterologous pathogenic genotype I PRRSV strain (isolated in UK in 2011; 88 % ORF5 homology; $10^{7,7}$ $CCID_{50}$/animal). The animals were examined daily after challenge until 13 weeks of age. Serum samples and saliva swabs were collected at 0, 5, 7, 14, 19, 21, 28 and 34 days post-challenge (dpc). Virus detection and virus titration in both samples were analysed by real time RT-qPCR. The Area Under the Curve (AUC) of virus titre from serum samples was calculated from the entire post-challenge period. AUC, length of the viraemia and excretion, and virus titre in saliva and serum were analysed using a non-parametric Mann-Whitney U test (p<0.05) and number of viraemic and shedding piglets using a two-tailed chi-square test/Fisher exact (p<0.05).

RESULTS

The vaccinated group had a significantly lower number of viraemic piglets (at 14, 19, 21 and 34 dpc, Figure 1). The median AUC of the vaccinated group was $2.3x10^3$ $CCID_{50}$/ml and it was statistically lower than the control group ($1.5x10^4$ $CCID_{50}$/ml). The length of the viraemia (Table 1) was also statistically shorter in the vaccinated group.

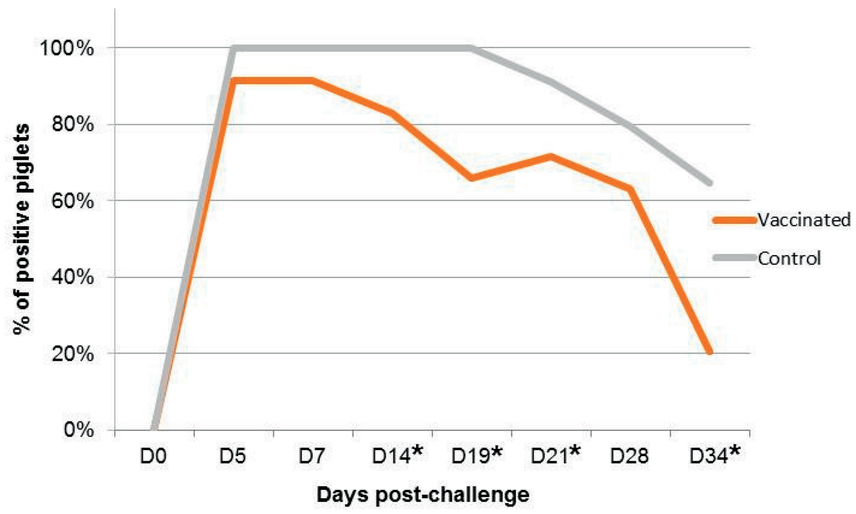

Figure 1. Virus detection in serum. *Statistically significant differences between groups (p<0.05).

Table 1. Length of viraemia after challenge.

		Vaccinated	Control
Days of viraemia	*Mean*	26.2[a]	30.9[b]
	SD	6.1	4.8

[a,b] Different superscripts indicate statistically significant differences between groups (p<0.05).

The vaccinated group had a significantly lower number of shedding piglets (at 5, 7, 14, 19 and 21 dpc, Figure 2) and viral load in saliva ($CCID_{50}$/ml) (at 5, 7, 14, 19 and 21 dpc, Table 2). The length of virus excretion (Table 3) after challenge was also statistically lower in the vaccinated group compared to the non-vaccinated piglets.

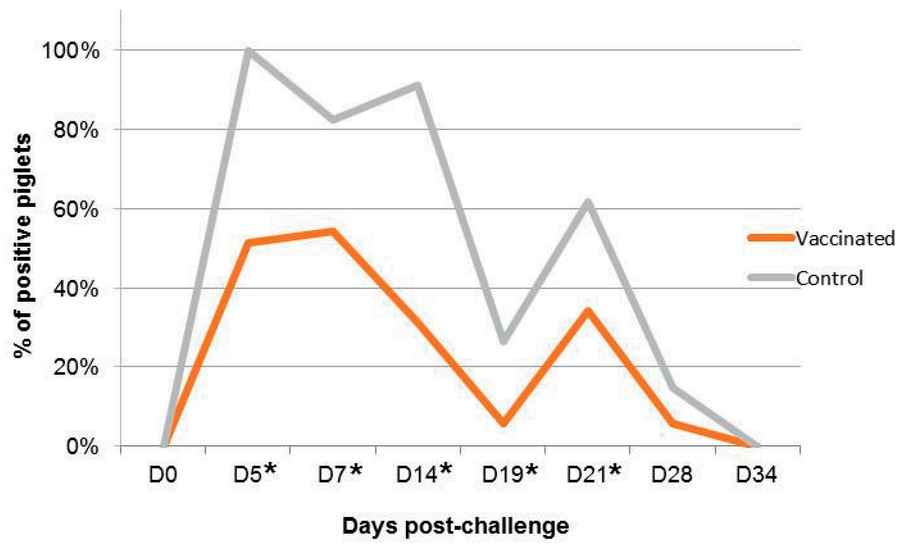

Figure 2. Virus detection in saliva. *Statistically significant differences between groups (p<0.05).

Table 2. Virus titre in saliva after challenge.

DPC	0	5	7	14	19	21	28	34
Vaccinated	0.0E+00	2.2E+01[a]	1.2E+00[a]	2.9E+00[a]	5.7E-02[a]	4.4E-01[a]	5.7E-02	0.0E+00
Control	0.0E+00	3.3E+01[b]	1.8E+00[b]	5.0E+00[b]	2.6E-01[b]	1.8E+00[b]	3.3E-01	0.0E+00

[a,b] Different superscripts indicate statistically significant differences between groups (p<0.05).

Table 3. Length of virus excretion.

		Vaccinated	Control
Days of shedding	*Mean*	12.9[a]	20.1[b]
	SD	8.8	4.9

[a,b] Different superscripts indicate statistically significant differences between groups (p<0.05).

CONCLUSIONS

Vaccination with UNISTRAIN® PRRS significantly reduced the viral load in sera, the number of viraemic piglets and the length of the viraemia after a heterologous PRRS challenge with a pathogenic UK strain. Moreover, vaccination with UNISTRAIN® PRRS significantly reduced the amount of virus excreted, the number of piglets excreting virus and also the duration of viral excretion in saliva after challenge. Therefore, UNISTRAIN® PRRS is a useful tool to reduce the transmission of PRRS virus within and between pig populations.

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