Maternally derived antibodies do not interfere with immune response induced in piglets after the administration of BIOAFTOGEN trivalent vaccine

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Introduction

The assessment of the best strategy for vaccination against foot-and-mouth disease (FMD) in piglets born to vaccinated sows with vaccines administered in vaccination programs is needed [1]. The present work assessed the effect of maternally derived antibodies (MDA) on the immunization of piglets with a commercial trivalent vaccine (BIOAFTOGEN) to determine the optimal age for vaccination.

Materials y Methods

Twelve pregnant sows were enrolled in the study, 4 remained unvaccinated while 8 were vaccinated twice, at 64 and 85 days of gestation, with a regular dose (2 mL) of Bioaftogen®, Biogénesis Bagó (oil vaccine containing O1 Campos, A24 Cruzeiro, A2001 Argentina vaccine strains). Piglets born from vaccinated and unvaccinated sows were randomly assigned into 4 groups, receiving different vaccination schemes (Table 1). Sera antibody levels against each of the vaccine strains were determined by Liquid Phase Blocking ELISA (LPBE) at different times between 0 and 120 days post vaccination (dpv).

Differences in antibody titers among animals from the same group with and without MDA as well as among animals in different groups, were assessed by the Mann-Whitney test. Wilcoxon signed-rank test was performed to compare the antibody titers obtained from animals in the same group at two different post vaccination times. The Spearman´s rank correlation test was applied to analyze the relationship between the titers of MDA at the day of vaccination and the antibody titers at 28 dpv.

Table 1. Experimental groups

#	Vaccination Scheme	N	Born from sows
1	1 dose at 2 weeks old	20	Vaccinated
		15	Unvaccinated
2	1 dose at 5 weeks old	10	Vaccinated
		10	Unvaccinated
3	2 doses at 5 and 8 weeks old	10	Vaccinated
		10	Unvaccinated
4	Not Vaccination	10	Vaccinated
		10	Unvaccinated

Results

Sows responded satisfactorily to vaccination during pregnancy, with mean Log10 antibody titers > 2.5 after 56 dpv and 91 dpv (corresponding to 1 and 35 days postpartum) (Figure 1).

Piglets born from unvaccinated sows showed undetectable antibody titers at 0 dpv, while those born from vaccinated sows exhibited high levels of MDA (mean Log10 antibody titers > 2.5). In group 4, MDA levels remained high up to 35 days of age and became undetectable after 82 days of age (Figure 2.D). All piglets in groups 1, 2 and 3 responded properly to vaccination, mean Log10 antibody titers remained above 2.5 up to 120 dpv (Figure 2.A-C). No statistically significant differences were observed in antibody titers between animals with or without MDA at different times post vaccination. Also, no significant differences were found in antibody response at different times post vaccination between animals vaccinated at 2 and 5 weeks old. Moreover, the correlation analysis evidenced no association between the antibody response to BIOAFTOGEN at 28 dpv and the level of MDA at the time of vaccination (Figure 3).

Conclusions

BIOAFTOGEN induced high and long-lasting antibody response in piglets vaccinated at early age (2 or 5 weeks-old). In our study, MDA did not interfere with the antibody response induced after vaccination as it was shown in previous studies with other vaccine formulations [2,3]. Therefore, in high-risk areas, administration of this vaccine would be recommended from 2 weeks old.

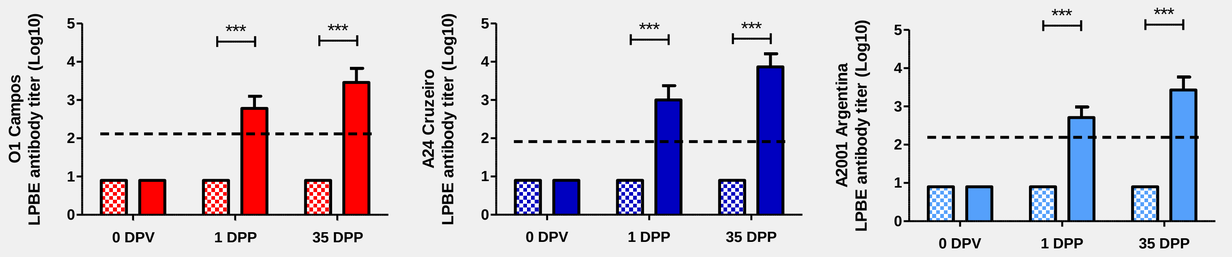

Figure 1. LPBE antibody titers against each vaccine strain in vaccinated (filled bars) and unvaccinated (checkered bars) pregnant sows. Data is shown as mean +/- sd. The black dashed line shows LBPE cut-off value. Undetectable levels of antibodies (titer < 0.9) were expressed as 0.9. ***p<0.001. DPV: days post vaccination, DPP: days post partum. 1 DPP corresponds to 56 DPV and 35 DPP to 91 DPV.

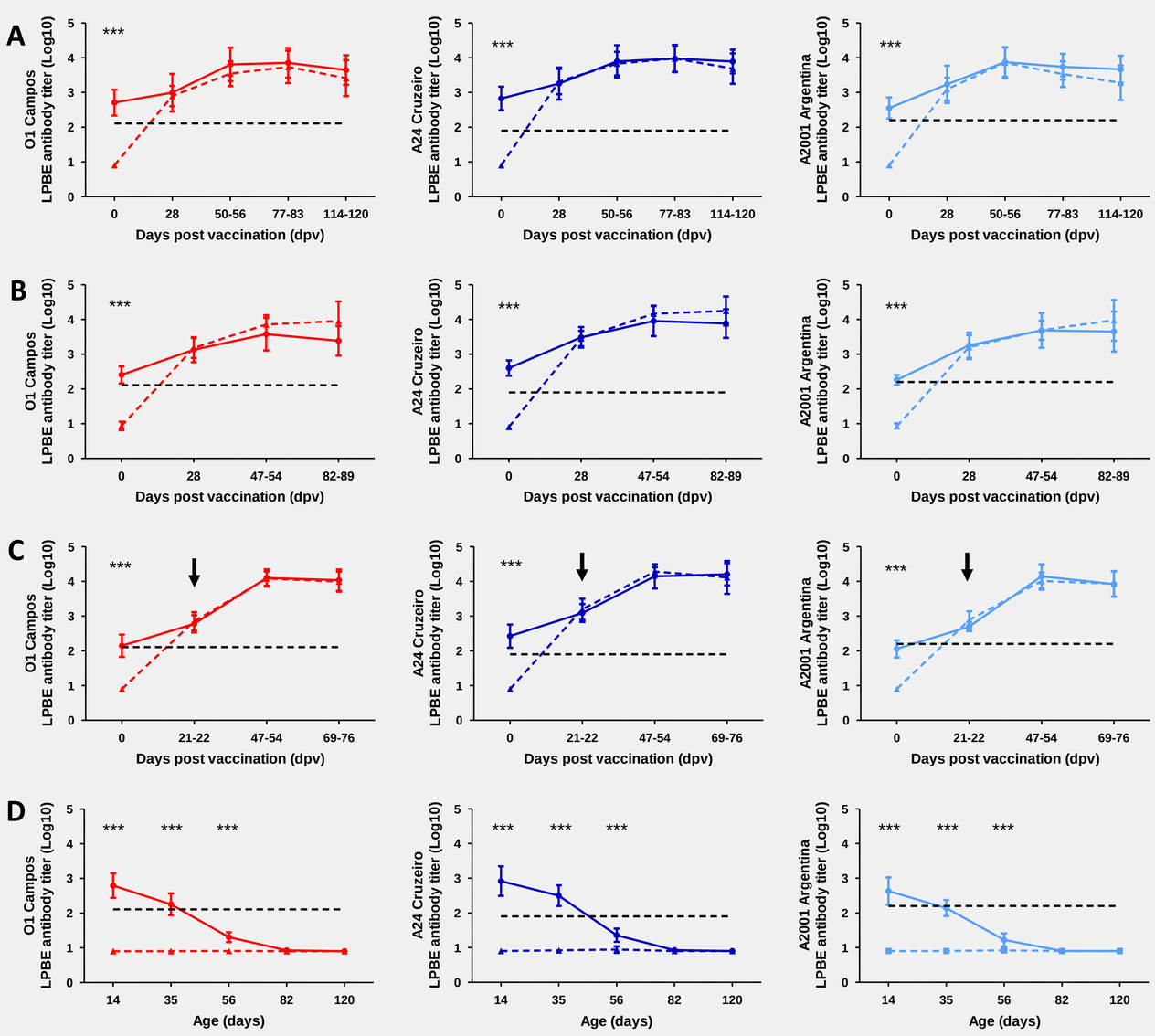

Figure 2. LPBE antibody titers against each vaccine strain in piglets born from vaccinated (continuous line) and unvaccinated (colored dashed line) sows. A) Group 1. B) Group 2. C) Group 3. D) Group 4. Data is shown as mean +/- sd. The black dashed line shows LBPE cut-off value. The black arrow indicates the administration of a booster dose. Undetectable levels of antibodies (titer < 0.9) were expressed as 0.9. ***p<0.001, Mann-Whitney test.

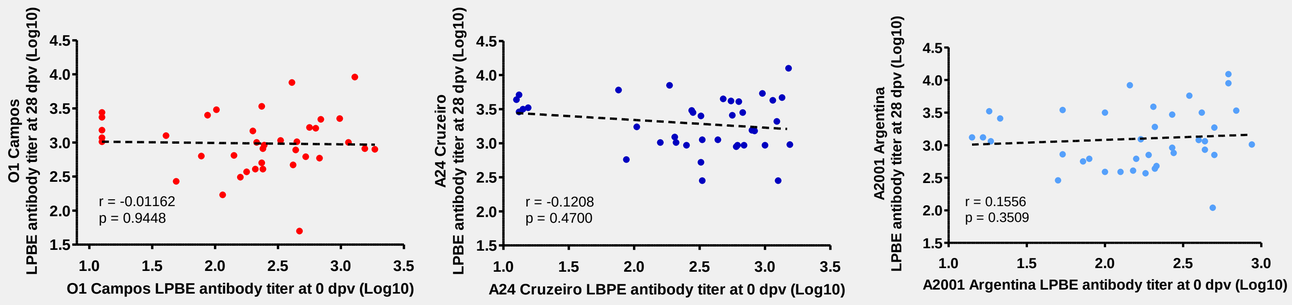

Figure 3. Correlation analysis between MDA levels at the time of vaccination and the antibody response against each vaccine strain after administration of BIOAFTOGEN.

References

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