Clostridium novyi TOXIN NEUTRALIZATION BY SERA FROM IMMUNIZED SOWS WITH SUISENG®

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INTRODUCTION

Clostridial infections in swine have been recognised for many years as a complex and fatal disease, because the infections progress rapidly and different external factors, like management changes, animal stress and traumatic damage, are deeply involved in the induction of disease. Vaccination has become an important control measure in domestic animals, since the course of Clostridial associated diseases progresses rapidly and often is fatal. The classic disease in swine produced by *Clostridium novyi* is Sudden Death of adult and apparently healthy animals.

SUISENG® is a polivalent vaccine with two main indications, on one hand the prevention of piglet neonatal diarrhoea by means of colostrum passive immunity and, on the other hand, the prevention of Sudden Death caused by *C. novyi* infection of adult animals.

The objective of this study was to assess the serological response against α-toxin of *C. novyi* elicited by the immunization with Suiseng. This was accomplished using the sera of immunized sows of 4 independent studies.

First of all, the IgG seroprofile was assessed using an ELISA against the toxoid included in the vaccine. Afterwards, to obtain the biological significance of these antibodies, the seroneutralization properties against the α-toxin of *C. novyi* of swine sera were analyzed.

MATERIALS AND METHODS

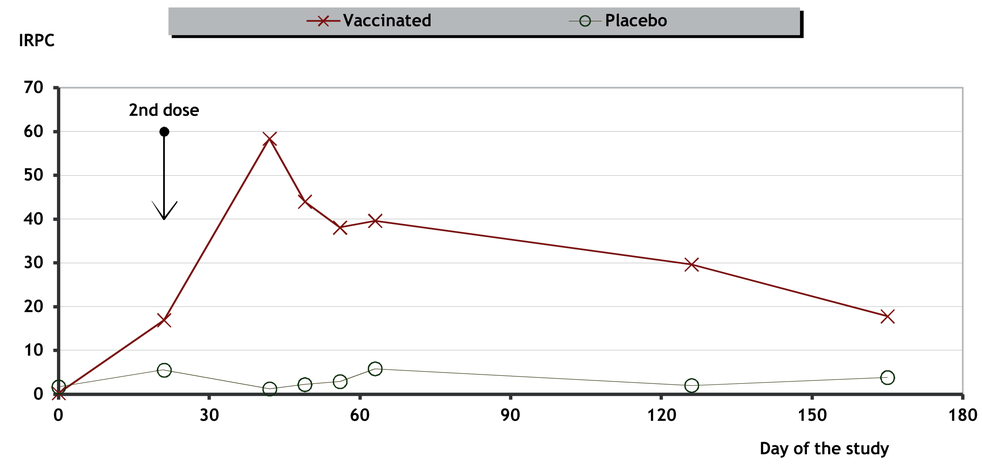
Sera from sows vaccinated with SUISENG® and with a Placebo were used for this work. The sera came from 4 independent studies. All the animals received the same immunization program, two doses of the vaccine/placebo administered 3 weeks apart during the gestation. The samples of one of the studies were used for the IgG assessment using the ELISA. The animals were sampled periodically from day 0 (first dose of the vaccine) to approximately 5.5 months forwards. The results for each sample of this assay were normalized using a positive control and a negative control included in each plate.

For the neutralization assay, the sera samples obtained 3-4 weeks after the second dose of the vaccines were used. All the samples of the same group of each study were pooled previous the run of the test. Briefly, serial dilutions of the pooled sera were mixed with 2 LD_{50} (lethal dose 50% for mice) of the α-toxin of *C. novyi*. The mixtures were injected to mice and the survival monitored for 5 days. Survival of more than 50% of mice indicated that the toxin was neutralized.

RESULTS

The mean of normalized results (IRPC) of the ELISA are represented in the next figure. Each point is the mean on 10 animals included in each study group.

Figure 1. Serological response assessed with the ELISA.



The results of the seroneutralization assay are exposed in the next table. Results with surviving mice >50% mean that the toxin is neutralized by the sample.

Table 1. Percentage of surviving mice after the challenge with the mix of sample serum and the clostridial toxin.

Study	Treatment Group (n)	Dilution of pooled sera 1/2	1/8	1/32
1	Vaccinated (5)	100%	100%	0%
	Placebo (5)	0%	0%	0%
2	Vaccinated (5)	100%	100%	0%
	Placebo (5)	0%	0%	0%
3	Vaccinated (10)	100%	100%	0%
	Placebo (10)	0%	0%	0%
4	Vaccinated (5)	100%	100%	100%
	Placebo (5)	0%	0%	0%

DISCUSSION

The results clearly demonstrate that SUISENG® induce the production of specific antibodies against the α-toxin of *C. novyi.* These antibodies last for at least 5 months, when a booster dose would be recommended.

The neutralization assay demonstrates that the antibodies elicited by the immunization are biological active and they are able to neutralize completely the toxin.

The sudden death attributable to the infection with *C. novyi* can be prevented by means of the neutralization of the main toxin responsible of the clinical signs. The immunization with SUISENG® induces the significant production neutralizing antibodies against α-toxin of *C. novyi*.

BIBLIOGRAPHY

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