Effect of PCV2 Vaccination on Co-infections with Porcine Reproductive and Respiratory Syndrome Virus and Mycoplasma hyorhinis

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Introduction

The "post-weaning multisystemic wasting syndrome" (PMWS) is one of the PCV2 associated diseases (1; 2). Further epidemiological studies showed a frequent involvement of co-infections in PCV2 disease complex such as porcine reproductive and respiratory syndrome virus (PRRSV), swine influenza virus (SIV), *Mycoplasma hyopneumoniae* and other pathogens (3) which cause an activation of the immune system (4). The purpose of this study was to investigate the effects of a single-dose PCV2 ORF2 subunit vaccination (Ingelvac® CircoFLEX™, Boehringer Ingelheim Vetmedica GmbH, Germany) on co-infections.

Materials and Methods

1519 three weeks old piglets from originally 12 different farms were randomly divided in two groups; one was treated with vaccine, the other with placebo. Beside a weekly monitoring of clinical signs of PMWS from 14% of study animals blood samples were weekly collected, after an age of 15 weeks the samples were taken every second week. Antibody titre (IFAT) and viral load (PCR) were quantitatively determined. From dead pigs lung tissue was used to detect specific nucleid acids of PCV2, PRRSV and *Mycoplasma (M.) hyorhinis*.

Results and Discussion

The viral load of PCV2 in serum had the highest level in 11 to 16 weeks old pigs. After the onset of PCV2 viraemia (10 – 26 weeks of age) beside wasting coughing was the predominant clinical sign. Before PCV2 viraemia the analysis of lung samples showed no differences in the frequency of pathogens among both treatment groups.

Table 1: Co-infections in placebo-treated animals (PCR)

viraemia phase	before onset		acute	chronic
age (weeks)	3-8	9-10	10-16	17-26
	n	n	n	n
PCV2	0/5	1/8	17/17	7/7
PRRSV	0/5	4/8	12/17	0/7
M. hyorhinis	0/5	2/8	13/17	3/7
PCV2+PRRSV	0/5	0/8	2/17	0/7
PCV2 + *M. hyorhinis*	0/5	0/8	3/17	1/7
PRRSV +*M. hyorhinis*	0/5	1/8	0/17	0/7
PCV2+PRRSV +*M.hyorhinis*	0/5	1/8	10/17	0/7

After onset of viraemia vaccinated animals had statistically less *M. hyorhinis* ($p \leq 0.05$) and considerable less PRRSV positive lungs compared to lungs of placebo-treated animals (Figure 1). In animals of the placebo group triple infections with PCV2, PRRSV and *M. hyorhinis* were most commonly observed in the lung samples (10/24) (Table 1). In contrast the vaccinated pigs (1/11) had considerably lower triple infections and no dual infections with PCV2 and *M. hyorhinis*. The exposition of the herd to various pathogens at the time of changing of housing and the stress of mixing various farms of origin were classical predisposing factors which could lead to an outbreak of PMWS.

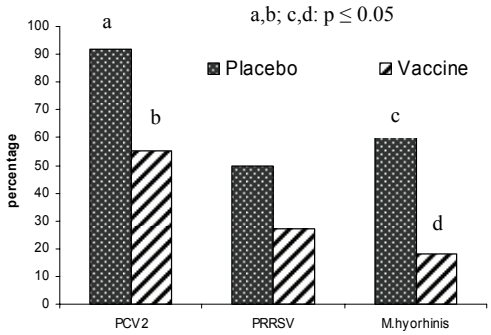

Figure 1: Comparison of pathogens in lungs of vaccinated (n=11) and placebo-treated animals (n=24)

The considerable higher presence of PRRSV and *M. hyorhinis* in placebo-treated animals suggests a higher susceptibility and is jointly responsible for clinical respiratory signs. These were significantly lower in vaccinated pigs.

Conclusion

The examination of lung samples revealed a considerably reduced number of co-infections with PRRSV and *M. hyorhinis* in vaccinated animals than in lungs of placebo-treated pigs. These data indicate that PCV2 vaccination can reduce PMWS signs under normal pig husbandry conditions. Furthermore these results indicate that the control of PCV2 viraemia also reduces the probability of infections wit PRRSV and *M. hyorhinis*.

References

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