Effects of two different Circovirus type 2 and *Mycoplasma hyopneumoniae* vaccine combinations on acute phase proteins in piglets

I. Hernández-Caravaca[1], D. Escribano[2], V. Blasco-Gil[3], S. Figueras Gourgues[1], V. Rodriguez-Vega[1], J. Cerón[2]

[1]Boehringer Ingelheim España S.A., Spain; [2]Interdisciplinary Laboratory of Clinical Analysis, Interlab-UMU, Regional Campus of International Excellence "Campus Mare Nostrum", University of Murcia, Spain; El Cerdo Feliz 2002 S.L., Spain

INTRODUCTION

The age at vaccination against circovirus type 2 (PCV2) and *Mycoplasma hyopneumoniae (M.hyo)* coincides with weaning, which is one of the most stressful events in the pig's life. This can cause immune system dysfunctions affecting pig health, growth and feed intake[1]. Therefore, vaccination should not contribute to compromised well-being and hinder the adaptation to this new situation. Acute phase proteins (APPs) have been proposed as suitable biomarkers to monitor stress[2], for detection of inflammation and for monitoring the well-being of pigs[3]. In addition, it has been reported that weaning stress increases serum level of APPs[4] and that the Hp level and the average daily weight gain (ADWG) may be inversely related post-weaning5. The aims of this study was to evaluate the development of haptoglobin (Hp) and C-reactive protein (CRP), rectal temperature and the ADWG obtained after application of two different vaccination protocols against PCV2 and *M. hyo* in piglets, during the nursery phase.

MATERIALS AND METHODS

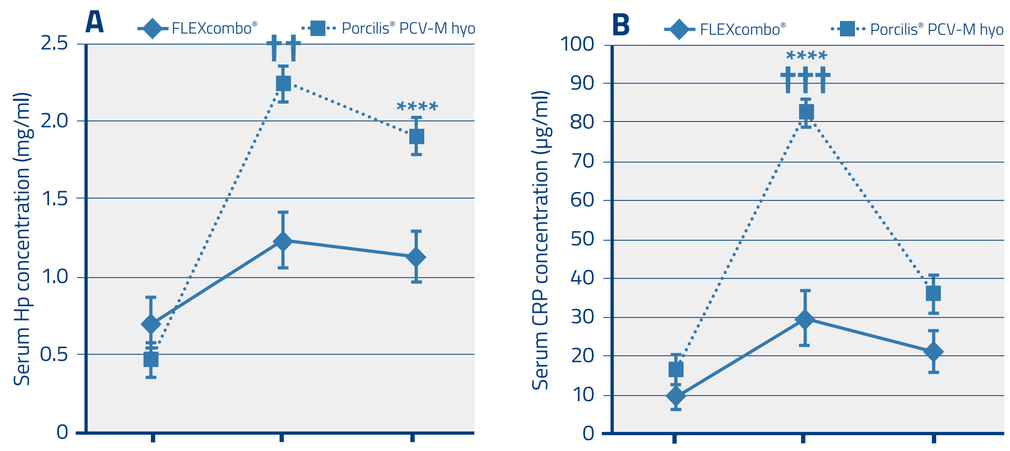
The study was conducted in a 1,000 sow farm located in Southeast Spain. Two groups of 20 piglets (10 males and 10 females per group) were vaccinated, 7 days after weaning, with 1 ml of CircoFLEX® and with 1 ml of MycoFLEX® in a single injection of 2 ml (A, FLEXcombo®; Boehringer Ingelheim, Spain, SA) or with a single injection (2 ml) of (B) Porcilis® PCV-M Hyo (Intervet International B.V., The Netherlands). Blood samples and weight of each animal were taken before vaccination (basal levels; Fig 1.), 24 h after vaccination (24 h Post-V) and 48 h after vaccination (48 h Post-V). Also, the weight at 39 days after vaccination was taken (39 d Post-V). The rectal temperature was recorded before and 7 h after immunization. The Hp and CRP concentrations in serum were determined using an automatic biochemical analyzer (Olympus 2,700 automatic chemistry analyzer, Germany). The statistical analyses were performed using GraphPad Prism 6 (Graph Pad, Software, USA). A two-ways ANOVA test was performed and a value of $p < 0.01$ was used to indicate significance.

RESULTS

The administration of both vaccines increased concentrations of Hp (Fig 1a) and CRP (Fig 1b) respect to basal level of each group. However, this increase is only significant in group B. In addition, 24 h Post-V, Hp and CRP concentrations were significantly higher (approximately 3-fold higher) in group B compared to group A. 7h post immunization, the rectal temperature was significantly higher ($p < 0.01$) in animals vaccinated with B (40.9 °C) compared to A (39.9 °C). Moreover, in relation to baseline, the ADWG were higher in animals vaccinated with A compared to the animals vaccinated with B at 24 h (173 g vs -29 g) and at 48 h (193 g vs 48 g) Post-V.

Finally, the average weight gain 39 d Post-V was of 13 kg for A and 11.5 kg for B.

Table 1: Serum (a) Haptoglobin (Hp), (b) and C-reactive protein (CRP) concentrations in piglets vaccined with FLEXcombo® (n = 20) or with Porcilis® PCV-M Hyo (n = 20) before vaccination (Baseline), 24h post-vaccination (24h Post-V) and 48 h post-vaccination (48 h Post-V). The values are mean ± SEM. ****P < 0.0001 compared with baseline value of each group. ††P < 0.01 and †††P < 0.001 comparing FLEXcombo® and Porcilis PCV-M Hyo groups.



CONCLUSION

Based on the data obtained in this study, the production of both APPs has been significantly higher in animals vaccinated with Porcilis® PCV-M Hyo. Furthermore, after immunization with this vaccine a significant increase of rectal temperature and lower ADWG was observed. As described in other studies vaccination with FLEXcombo® had a minor effect on parameters indicating well-being and stress[6,7], which are important for adaptation and growth performance during the nursery period.

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