Effects of two different circovirus type 2 and *Mycoplasma Hyopneumoniae* vaccination protocols on acute phase proteins in piglets

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INTRODUCTION

Co-infection with porcine circovirus type 2 (PCV2) and *Mycoplasma hyopneumoniae* (M. hyo) plays a primary role in the porcine respiratory disease complex (PRDC)[1]. PRDC is one of the major causes of economic losses in the swine industry and its control is mainly based on management strategies and vaccination, against these diseases, in post-weaning period[2,3]. The post-weaning is a critical period and for this reason is very important applying vaccines that do not hinder adaptation to this new situation. The acute phase proteins (APPs) in serum have been proposed as suitable veterinary biomarkers to monitor the stress[4,5] and the inflammatory response[6], which makes APPs notable parameters for the global assessment of pig welfare[7]. The aim of this study was to evaluate the welfare to vaccination after the application of two different vaccination protocols, against PCV2 and M.Hyo, through of measurement of rectal temperature and two APPs; haptoglobin (Hp) and C-reactive protein (CRP).

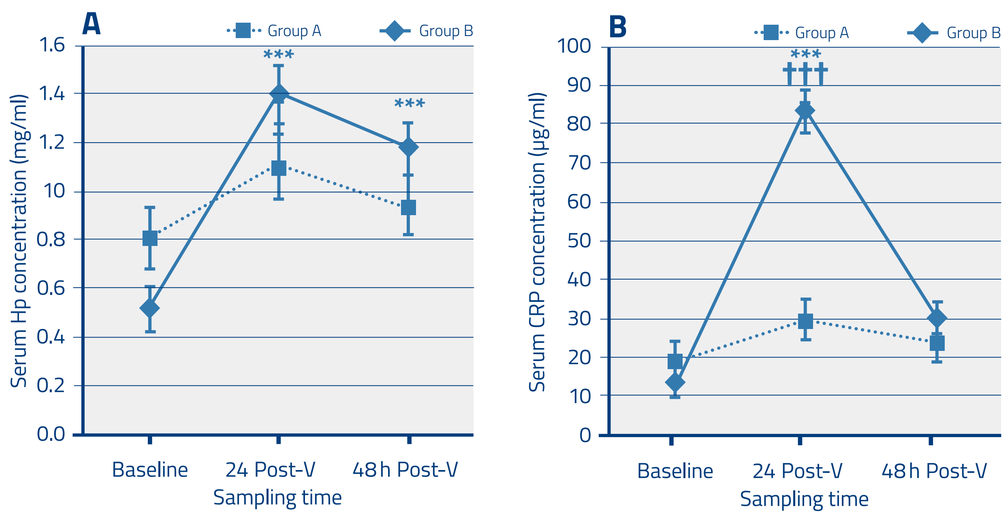
MATERIALS AND METHODS

In this study forty piglets Pietrain x (Landrace x Large White) crossbred, of 3.5 weeks of age, from a farm located in South-Eastern Spain, were used. The animals were divided in two groups of 20 animals (10 females and 10 males). The group A was vaccinated with 1 ml of CircoFLEX® and with 1 ml of MycoFLEX® in a single injection of 2 ml (FLEXcombo®; Boehringer Ingelheim, Spain, SA). The group B was vaccinated with Porcilis PCV® (Intervet International, The Netherlands) and Stellamune Mycoplasma® (Elanco Animal Heath, Spain) in two injections of 2 ml each. Blood samples were taken before vaccination (baseline), 24 h post-vaccination (Post-V) and 48 h Post-V. Body temperature was measured before vaccination (baseline) and 8 h Post-V. The levels of Hp and CRP were measured using an automated biochemistry analyser (Olympus 2700, Germany). The statistical analyses were performed using GraphPad Prism 6 (Graph Pad, Sowfware, USA). A two-ways ANOVA test was performed and a value of $P < 0.05$ was used to indicate significance.

RESULTS

After 8 h Post-V, group B showed evidence of pyrexia relative to baseline ($P < 0.001$) and rectal temperature levels in group B (40.6 °C) were significantly greater compared to group A (39.7 °C). The interaction between type of vaccination and day of sampling was significant for serum Hp (Fig 1a) and CRP (Fig 1b). Group B had elevated concentration of Hp relative to baseline at 24 h Post-V and 48 h Post-V ($P < 0.001$). Relative to baseline CRP concentration in group B were greater 24 h Post-V (Fig 1b). Group B had significantly greater serum CRP concentrations compared to group A ($P < 0.001$).

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



DISCUSSION AND CONCLUSION

According to the results obtained, the immunization with Porcilis PCV® and Stellamune Mycoplasma® produces significant increases in concentrations of both APPs compared with basal levels. Also, with this combination has been observed a higher increase of rectal temperature. Therefore, the lesser body temperature and production of APPs with FLEXcombo® contribute to welfare and may be facilitate the adaptation of piglets in this critical period. This enhanced adaptability of piglets vaccinated with CircoFLEX® and MycoFLEX® also have been showed in other trials versus these competitors[8,9].

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