IMMUNOLOGY & VACCINOLOGY

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INFLUENCE OF ANTIBIOTIC THERAPY ON THE HUMORAL IMMUNE RESPONSE TO VACCINATION IN WEANED PIGS

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Introduction

Pigs commonly are vaccinated at weaning and often treated with long-acting antibiotics. Some antibiotics were shown to impair responses to vaccination. The objective was to investigate the influence of long-acting antibiotics on antibody and immune cell responses in weaned pigs vaccinated with a circovirus type 2 (PCV-2) – *Mycoplasma hypopneumoniae* (Mhyo) vaccine.

Materials and Methods

Pigs were selected at weaning (day 0) and assigned to 8 treatment groups (n=8 pigs/group). Treatments included control, PCV-2/Mhyo vaccine, tulathromycin only, ceftiofur only, enrofloxacin only, and the combination of the PCV-2/Mhyo vaccine with one of the antibiotics. Vaccinations and antibiotics were administered on day 0. Blood samples were collected on days 0, 14, 21 and 35. Complete blood counts, number of immune cells (lymphocytes, T-cells, B-cells) and antibody titers were determined. Results were analyzed using repeated measures ANOVA and least square means were compared with the Tukey's method.

Results

In all groups, Mhyo antibody S/P ratios were highest at day 0 (0.58 $\pm$ 0.04) and lowest at day 35 (0.17 $\pm$ 0.02). The control group and groups receiving antibiotics only had highest PCV-2 antibody titers at day 0 (314 $\pm$ 42) and lowest at day 35 (107 $\pm$ 3.3). The vaccine only group and groups receiving vaccine and antibiotic combinations had increased ($P < 0.05$) PCV-2 antibody titers at day 35 (629 $\pm$ 133) compared to days 0 (355 $\pm$ 52), 14 (183 $\pm$ 17), and 21 (211 $\pm$ 20.1). Immune cell populations (CD4+CD8+, CD8+, CD4+, CD3+, CD3+CD21+), were significantly impacted by age (time). For example, the numbers of CD8+ cells increased from 1703 $\pm$ 77 /uL at day 0 to 3019 $\pm$ 214 /uLat day 35. Cell numbers were not significantly affected by treatments.

Discussion

The failure to observe an increase in Mhyo titers was due to maternal antibodies interfering with vaccine response, lack of sufficient antigen in the vaccine, or insufficient time to note a response.

There was no interaction between the response to the PCV2 vaccine and the three antibiotics. This lack of interaction does not support previous reports that long-acting antibiotics modulate the immune system and impact vaccination responses.