

A LABORATORY EVALUATION OF THE COMPARATIVE INJECTION SITE TISSUE REACTIVITY OF PCV2 VACCINES

J. Kolb, E. Diaz, R. Christmas
Boehringer Ingelheim Vetmedica, Inc., St. Joseph, MO

Introduction

Vaccines against PCV2 virus infection have recently been introduced into both the European (2004) and North American (2006) markets. Adjuvants are incorporated into many licensed vaccines to stimulate the immune system. Some adjuvants may contain mineral oil or other inflammatory substances which, while stimulating the immune system, may also lead to injection site lesions or anaphylaxis. This study was performed to compare the tissue reactivity at 14 days post-vaccination of three PCV2 piglet vaccines licensed in the United States.

Materials and Methods

Forty-eight weaned feeder pigs, approximately 18 to 21 days of age, were individually identified and randomly allocated to three treatment groups (n=16 per group) in a blinded, internal control study. The three groups included Ingelvac CircoFLEX® (Boehringer Ingelheim Vetmedica, Inc, St. Joseph, MO, a one dose vaccine), another one dose commercial vaccine, and a two dose commercial vaccine. Piglets were vaccinated according to manufacturer's instructions. A saline injection of equal volume was made on the opposite side of the neck to serve as an internal control. Piglets were humanely euthanized 14 days following the final injection (first dose for one dose vaccines, second dose for the two dose vaccine). An injection site tissue sample was harvested and placed into 10% buffered neutral formalin and sent to the Iowa State University Veterinary Diagnostic Laboratory. Tissues were processed and blindly scored for both intramuscular and connective tissue lesions on a 0-5 scale using the following criteria: score 0-no lesion; score 1-scattered lymphocytes & macrophages, mild perivascular cuffs; score 2-mild scattered moderate nonsuppurative inflammation; score 3-moderate multifocal pyogranulomatous inflammation; score 4-severe diffuse inflammation; score 5-massive necrosis or severe pyogranulomatous inflammation.

Results

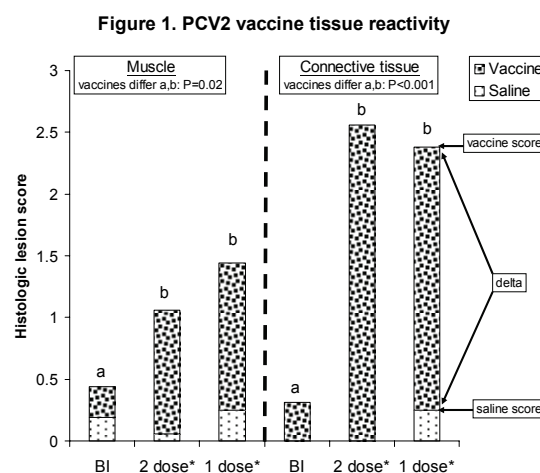
Muscle

No significant difference was detected between the Ingelvac CircoFLEX intramuscular injection site mean lesion score and its internal saline control score (0.44 vs 0.19 respectively, $p>0.05$, paired t-test). Pigs in the other one dose vaccine group (score 1.44) and the two dose vaccine group (score 1.06) had significantly higher intramuscular mean lesion scores than their internal saline control scores (0.25 and 0.06 respectively, $p<0.01$). Ingelvac

CircoFLEX pigs had significantly lower intramuscular lesion scores than the other vaccine groups ($p=0.02$, ANOVA). Saline scores for all groups were not significantly different from one another (mean score 0.17; Figure 1).

Connective tissue

Differences in connective tissue lesion scores were even more striking. No significant difference was detected between the Ingelvac CircoFLEX connective tissue injection site mean lesion score and its internal saline control score (0.31 vs 0.00 respectively, $p>0.05$, paired t-test). The other one dose vaccine group had an average vaccine connective tissue lesion score of 2.38 versus 0.25 for saline ($p<0.01$) while the two dose vaccine scores averaged 2.56 versus 0.00 for saline ($p<0.01$). Ingelvac CircoFLEX lesion scores were significantly lower than those for the other vaccines ($p<0.001$, ANOVA). Saline scores for all groups were not significantly different from one another (mean score 0.08; Figure 1).



*2 dose and 1 dose vaccines differ from saline, $P<0.01$.
BI vaccine not different than saline, $P>0.05$.

Discussion

The injection sites were examined earlier than labelled withdrawal times, but clearly demonstrated different levels of reactivity. Piglets receiving Ingelvac CircoFLEX had significantly lower lesion scores than the other vaccines, and were not significantly different than saline control sites. The other two vaccines had lesions that were significantly worse than saline control sites and the Ingelvac CircoFLEX group. Injection site lesions may be sustained and warrant extended withdrawal times. Sustained lesions could potentially result in reduced carcass value at harvest or reduced weight gain following vaccination.