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THE AETIOLOGICAL ROLE OF PORCINE CIRCOVIRUS TYPE 2 IN ACUTE DIARRHOEA OF WEANERS IN DANISH HERDS

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Introduction

Porcine circovirus type 2 (PCV2) has been considered aetiologically involved in the porcine enteritis complex (1).

The objective of the current study was to investigate the occurrence of PCV2 in pigs with and without diarrhoea during outbreaks of acute treatment indicated diarrhoea in pigs between 10 and 70 days post weaning.

Materials and methods

A case control study was conducted. Herds were selected by multistage sampling. All herds serviced by six specialized swine veterinarians from the same vet practice at Zealand and fulfilling the inclusion criteria were selected. The criteria were recurring therapeutic use of in-feed or in-water medication for diarrhoea at room level in pigs between 10 and 70 days post weaning. Only herds representing modern intensive production systems were selected. One outbreak of acute diarrhoea was investigated in each herd. All herds were visited the day following notification from the farmer/veterinarian of an acute treatment requiring outbreak of diarrhoea and the farmer was not allowed to medicate before the pigs were examined. If the pigs had received antibiotic batch medication within the last 7 days of the examination day, the outbreak was excluded from the study.

A sample of 80 pigs in each herd was selected by systematic random sampling among all pigs in the nursery room where the outbreak of acute diarrhoea occurred. The selected pigs were subjected to a clinical examination and faecal samples were collected. Among the examined pigs a simple random sample of 8 pigs with diarrhoea and 8 pigs without diarrhoea was selected and euthanized. Immediately after euthanasia tissue samples were obtained from jejunum, ileum and colon.

Necropsy was performed at DTU-VET the following day. Tissue samples were obtained from apparent gross lesions and the mesenteric lymph nodes. All tissues samples were examined for PCV2 by immunohistochemistry (IHC) and scored on a scale from 1 to 4. Faecal samples were examined for PCV2 by quantitative PCR (qPCR). Dry matter (DM%) was determined for the faecal samples. DM% ≤ 18 was considered as diarrhoea (1) and was used for final classification of pigs as diarrheic (cases) or non-diarrheic (controls) in the statistical analysis. Student t-test, Fisher's exact or Chi-sq tests were applied for unconditional statistical testing.

Results

A total of 20 outbreaks were investigated. Samples from the first 15 outbreaks have currently been examined and were included in the analyses.

Prevalence of PCV2 qPCR positive pigs was significantly different between outbreaks ($p<0.0001$).

In 5 outbreaks PCV2 was not detected by either qPCR or IHC. Six of 13 IHC positive pigs were detected in the same outbreak. The remaining 7 IHC positive pigs were evenly distributed among 4 outbreaks. Prevalence of PCV2 positive pigs were not significantly different (Chi-sq, $p>0.05$) between pigs with and without diarrhoea, table 1. Odds ratio of having diarrhoea for IHC positive compared to negative pigs were 1.67 (95% CI: 0.46 – 6.7).

Mean PCV2 excretion level in qPCR positive pigs was not significantly different ($p>0.05$) between pigs with diarrhoea (mean log10 = 6.25 copies/g faeces, sd = 1.37)) and without diarrhoea (mean log10 = 6.27 copies/g faeces, sd = 1.21).

Discussion

The non-significant differences in the prevalence and excretion levels of PCV2 in pigs with and without diarrhea imply that PCV2 was not the cause of diarrhea. Other explanations may be that the non-diarrheic pigs were in the incubation phase of diarrhea or that some pigs were able to counter the PCV2 infection without developing diarrhea.

Based on this study PCV2 should not be considered a major intestinal pathogen in weaners.

References

1. Jensen, et al., 2006. J. Comp. Pathol. 135, 176-182.