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Published in:
IPVS 2010

Publication date:
2010

Document version
Publisher's PDF, also known as Version of record

Citation for published version (APA):
Holyoake, P. K., Hjulsager, C. K., Larsen, L. E., Pedersen, K. S., Johansen, M., Stege, H., ... Nielsen, J. P. (2010). A preliminary study of the association between porcine circovirus type 2, *Lawsonia intracellularis* and diarrhoea in growing pigs. In *IPVS 2010: proceedings* (pp. 284)

21ST INTERNATIONAL PIG VETERINARY SOCIETY (IPVS) CONGRESS



IPVS 2010

Proceedings

JULY 18 - JULY 21, 2010

Vancouver Convention Centre, West Building

Vancouver, British Columbia, Canada

www.ipvs2010.com



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A preliminary study of the association between Porcine Circovirus Type 2, *Lawsonia intracellularis* and diarrhoea in growing pigs

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Introduction

Porcine Circovirus Type 2 (PCV2) infection is endemic in pig herds in most countries. Initially, PCV2 was linked to post-weaning multi-systemic wasting syndrome (PMWS). More recently, other disease syndromes have been associated with PCV2, and PCV2 has been reported to cause lesions similar to those of *Lawsonia intracellularis* (*L. intracellularis*).¹ Our hypothesis was that there is an association between the quantities of PCV2 in serum and faeces, *L. intracellularis* in the faeces and diarrhoea in grower (>10 weeks) pigs.

Materials and Methods

Forty grower pigs were selected on six farms in Denmark for a case-control study. Each pig was ear-tagged and assessed for faecal consistency (normal, loose, fluid). Approximately half of the pigs had loose or fluid faeces and were classed as "diarrhoeic". Blood and faecal samples were collected from each pig and tested using real-time PCR specific for PCV2 (blood and faeces) and *L. intracellularis* (faeces only).^{2,3} The associations between diarrhoea (+/-) and serum and faecal PCV2 quantity (negative/low versus moderate/massive), and between diarrhoea and *L. intracellularis* bacterial quantity (negative/low versus moderate/massive) were analysed. The association between the quantity of PCV2 in blood and PCV2 in faeces, and between the quantity of PCV2 in faeces and *L. intracellularis* in faeces were analysed. All analyses were conducted using generalized linear mixed models, with farm as a random effect (Genstat 11th edition).

Results

Two farms had no pigs with moderate/massive PCV2 results in blood or faeces. One farm had no pigs with a negative/low faecal PCV2 result. Two farms had pigs with no moderate/massive *L. intracellularis* results. Pigs with diarrhoea were no more likely than pigs without diarrhoea to have moderate/massive quantities of PCV2 in blood or faeces ($p>0.05$). Pigs without diarrhoea were no more likely than pigs with diarrhoea to have

negative/low quantities of PCV2 ($p>0.05$). Pigs with moderate/massive quantities of *L. intracellularis* had 1.91 times the odds (95%CI 1.04 3.49) of having diarrhoea than pigs without diarrhoea ($p<0.05$). The farms where no pigs had moderate/massive quantities of PCV2 and/or *L. intracellularis* were excluded from analyses of associations between the two pathogens. Pigs with moderate/massive quantities of PCV2 in serum had 14.4 times the odds (95%CI 1.08 191.6) of having moderate/massive quantities of PCV2 in faeces than pigs with low/negative PCV2 serum results ($p<0.05$). There were no significant ($p>0.05$) associations between PCV2 quantities in blood or faeces, and *L. intracellularis* quantities in faeces.

Discussion

These preliminary results suggest PCV2 was not associated with diarrhoea in pigs on the six farms studied. Pigs with diarrhoea shed moderate/massive quantities of *L. intracellularis* in their faeces. There was no evidence of co-infection between PCV2 and *L. intracellularis*. PCV2 results for blood and faeces from the same pig suggested that either clinical sample may be tested with a similar result. As there was evidence of *Brachyspira* spp. infection in euthanized diarrhoeic pigs on all farms (data not shown)⁴, the interaction between *L. intracellularis* and *Brachyspira* spp. warrants investigation.

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Acknowledgements

This project was supported by the University of Sydney, University of Copenhagen, Danish Pig Research Centre, Technical University of Denmark and Australian Pork Ltd. We thank the participating producers and veterinarians for their assistance.