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Original article

A comparison of immunohistochemistry and *in situ* hybridization for the detection of porcine circovirus type 2 in pigs

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Abstract

The aim of this study was to develop and to optimize an immunohistochemistry (IHC) method for PCV2 identification and to compare it with an *in situ* hybridization (ISH) technique. The results demonstrated that both ISH and IHC successfully detected PCV2 viral antigens or nucleic acid in the examined tissues. Most of the slides identified previously in ISH as PCV2-positive were also positive in IHC. In the case of nearly half of the slides the results of IHC examination revealed an increase in the intensity of staining. IHC presented higher sensitivity and specificity than ISH. No negative impact of the time of paraffin block storage on ISH detection results was observed. In addition, IHC results were easier to interpret due to better image quality after staining. Overall results confirmed IHC was a reliable and useful technique for PMWS diagnosis.

Key words: immunohistochemistry, *in situ* hybridization, pigs, PCV2

Introduction

Porcine circovirus type 2 (PCV2) is a small, nonenveloped, single-stranded DNA virus with a circular genome (Tischer et al. 1982) and it is classified in the family *Circoviridae*. It is now considered one of the most important virus pathogens of swine (Opriessnig et al. 2007). PCV2 is an etiological agent of postweaning multisystemic wasting syndrome (PMWS) (Allan et al. 1998). The disease is characterized mainly by growth retardation in weaned pigs, skin pallor, dyspnea and occasionally jaundice (Allan and Ellis 2000). The virus is also involved in several clinical conditions, known as "porcine circovirus-associated disease" (PCVD, PCVAD), including PCV2-associated pneumonia, PCV2-associated enteritis, PCV2-associated reproductive failure and PCV2-associated porcine dermatitis and nephropathy syndrome (Oppriessnig et al. 2007, Gillespie et al. 2009). Diagnosis of PCVD, and PMWS in particular, is still a controversial issue, because PCV2 is a ubiquitous agent and its presence in the development of the disease is essential, but not sufficient (Allan and Ellis 2000). For this reason, to confirm PMWS the following criteria must be fulfilled: 1. finding characteristic symptoms of the disease (wasting, weight loss, respiratory disorders); 2. presence of the hallmark PCV2-associated microscopic lesions; 3. detection of PCV2 antigen or nucleic acid associated with the microscopic lesions by immunohistochemistry (IHC)

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