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Short communication

Incidence of parvoviruses in chickens infected with Marek's disease virus

K. Tarasiuk, G. Woźniakowski, E. Samorek-Salamonowicz

National Veterinary Research Institute (NVRI), Department of Poultry Viral Diseases,
Partyzantów 57 Avenue, 24-100 Pulawy, Poland

Abstract

The aim of the study was to determine co-occurrence of Marek's disease virus (MDV) and chicken parvovirus (ChPV) co-occurrence in field chicken flocks. The materials for the study derived from 115 broiler chickens or layer hens originated from 23 farms with suspicion of Marek's disease (MD). Dual infection with MDV and ChPV was found in 23 (20%) examined chickens. The results obtained suggest a possibility of influence of ChPV infection on efficacy of the MD vaccines.

Key words: Marek's disease virus (MDV), chicken parvovirus (ChPV), PCR

Introduction

Marek's disease (MD) is a lymphoproliferative disease of poultry that cause serious losses in chicken production. The aetiological agent of MD is cell-associated herpesvirus called Marek's disease virus (MDV). The only strategy of MD prevention is vaccination. The vaccines are based on the heterologous turkey FC126 HVT strain or on the attenuated CVI988/Rispens strain (Witter 1997, Witter and Schat 2003). However, successful vaccination against MD may be dependent on the immune status of vaccinated chickens and possible secondary infections with other poultry viruses.

Our previous data indicated the occurrence of parvoviral infections in approximately 18% of investigated chicken flocks (Tarasiuk et al. 2012). Taking into account the unknown effects of dual MDV and ChPV infection of chickens it is reasonable to monitor the occurrence of these two viruses. The aim of the

study was to determine the simultaneous occurrence of MDV and ChPV in field chicken flocks.

Materials and Methods

One hundred fifteen birds from 23 farms (75 layer hens from 15 farms and 40 broilers from 8 farms) were sent to the laboratory for the diagnostic examination of MD. Almost all birds were vaccinated against MD. Some of them showed various clinical symptoms and pathological lesions of MD. Homogenates of the liver, spleen, and gut were prepared and used for a direct DNA isolation using QIAamp Mini Kit (Qiagen, Germany).

PCR: Primers specific for 132 bp sequence of MDV as well as primers complementary to SORF1 gene of FC126 HVT were used for detection of MDV strains as previously described (Becker et al. 2003, Kozdrun et al. 2005, Woźniakowski et al. 2010). The

Correspondence to: K. Tarasiuk, e-mail: ktarasiuk@piwet.pulawy.pl, tel.: +48 81 889 30 35

Table 1. The coexistence of field and vaccine strains of MDV with parvoviruses in chickens.

MDV strain	Number of MDV positive samples/total number of samples	Number of ChPV positive samples/number of positive MD samples
MDV field	10/115 (8.6%)	2/10 (20%)
MDV field + HVT	40/115 (35%)	8/40 (20%)
HVT	10/115 (8.7%)	2/10 (20%)
CVI988	5/115 (4.3%)	1/5 (20%)
CVI988+HVT	10/115 (8.7%)	2/10 (20%)
None	40*/115 (35%)	8/40* (20%)
Total	115/115 (100%)	23/115 (20%)

Descriptions: MDV- field strain of MDV, CVI988 – vaccine strain, HVT – FC126 vaccine strain, ChPV – chicken parvovirus. * the number of MDV negative samples.

sequences of primers for the detection of NS gene of ChPV were used as previously described (Zsak et al. 2009).

Results and Discussion

The results are presented in Table 1. The field MDV strains were detected in 50 (43.6%) birds derived from eight farms of layer hens and two farms of broilers. Twenty percent of these birds revealed the presence of SORF1 genes of HVT FC 126 vaccine strain and additionally gene NS of ChPV. Rispens strain (132 bp sequence) or SORF1 gene of HVT FC 126 strains was detected in 25 (21.7%) birds, 20% of them showed additionally the occurrence of NS gene of ChPV. The presence of only alone NS gene of ChPV was found in 20% chickens.

The parvovirus infection widespread in chickens and turkeys from USA has been described (Zsak et al. 2009). In our country, birds infected with parvovirus were detected in 29.4% of turkey farms and in 22.2% of chicken farms (Domańska-Blicharz et al. 2012). These results were confirmed in the study of Tarasiuk et al. (2012).

Recently Marek's disease is found in vaccinated chickens more frequently than previously. The study conducted by Niczyporuk et al. (2012) demonstrated that the infection with fowl adenoviruses lowered replication of turkey herpesvirus FC126 in chicken embryo fibroblast culture. This inspired us to take the study on the role of parvovirus infection in cases of

MD in vaccinated chickens. The presented data showed the infection of ChPV in 20% vaccinated chickens, in which MD was diagnosed. The results obtained suggest a possibility of influence of ChPV infection on the efficacy of MD vaccines.

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