Morphology of immune organs after very virulent plus strain of Marek’s disease virus infection in vaccinated hens

J.P. Madej¹, G. Woźniakowski², A. Gaweł³

¹ Department of Histology and Embryology, Faculty of Veterinary Medicine, Wrocław University of Environmental and Life Sciences, Norwida 25, 50-375, Wrocław, Poland
² Department of Swine Diseases, National Veterinary Research Institute Pulawy (NVRI), al. Partyzantów 57, 24-100 Puławy, Poland
³ Department of Epizootiology and Clinic of Bird and Exotic Animals, Faculty of Veterinary Medicine, Wrocław University of Environmental and Life Sciences, pl. Grunwaldzki 45, 50-355 Wrocław, Poland

Abstract

Marek’s disease (MD) outbreaks in poultry flocks may be associated with overriding of vaccine immune protection by very virulent (vvMDV) or very virulent plus (vv+MDV) strains. This paper presents the study on lymphoid organ morphology in the latent phase of MD caused by vv+MDV which break post-vaccinal protection in hens. We also immunohistochemically examined B and T populations as well as B/T and CD4+/CD8+ ratio of lymphocytes in lymphatic organs and, as a background, in MD lymphomas from non-lymphatic organs. The number of antigen expressed cells was evaluated as a percentage of positive cells in the one power field. Organ samples were collected from 24 dead reproductive hens (Ross 308 line) in age between 35-56 weeks, infected with vv+MDV. The hens originated from farms with MD outbreaks, despite earlier routine vaccination with CVI988/Rispens + HVT. The control organ samples originated from 15 clinically healthy hens at the same age and line, subjected to the same vaccination schedule. The number of CD3+, CD8+ and TCRγδ+ cells was significantly lower in MDV infected thymus, spleen and cecal tonsils in comparison to that found in the control organs. The proportion of CD4+ was also distinctly reduced in the thymus and limited in the spleen of MDV infected hens. This study revealed that infection with field vv+MDV isolates might break post-vaccinal protection and influence the central and peripheral immune system. The decrease in CD8+ and TCRγδ+ cell number in the thymus, spleen and cecal tonsils suggests that primarily these cells are involved in cell-mediated cytotoxicity against MDV transformed cells during latency.

Key words: Marek’s disease, MDV, immune system, chicken, morphology, latent phase

Correspondence to: J. Madej, e-mail: jan_madej@interia.pl, tel.: +48 71 3205486