Evaluation of factors influencing the development of late Marek's disease virus-induced immunosuppression: virus pathotype and host sex

ABSTRACT

Marek's disease virus (MDV) is a herpesvirus that induces lymphoma and immunosuppression in chickens. MDV-induced immunosuppression (MDV-IS) is complex and can be divided into two phases: early-MDV-IS associated with cytolytic infection in the lymphoid organs in chickens lacking maternal antibodies against MDV (MAbs) and late-MDV-IS that appears later in the pathogenesis and occurs even in chickens bearing MAbs. We have recently developed a model to reproduce late-MDV-IS under laboratory conditions. This model evaluates late-MDV-IS indirectly by assessing the effect of MDV infection on the efficacy of infectious laryngotracheitis (ILT) vaccines against challenge with ILT virus. In the present study, we have used this model to investigate the role of two factors (MDV pathotype and host sex) on the development of late-MDV-IS. Five MDV strains representing three different pathotypes: virulent (vMDV; 617A, GA), very virulent (vvMDV; Md5), and very virulent plus (vv+MDV; 648A, 686), were evaluated. Only vv+ strains were able to induce late-MDV-IS. An immunosuppression rank (IS-rank) was established based on the ability of MDV to reduce the efficacy of chicken embryo origin vaccine (values go from 0 to 100, with 100 being the highest immunosuppressive ability). The IS-rank of the evaluated MDV strains ranged from 5.97 (GA) to 20.8 (617A) in the vMDV strains, 5.97 to 16.24 in the vvMDV strain Md5, and 39.08 to 68.2 in the vv+ strains 648A and 686. In this study both male and female chickens were equally susceptible to MDV-IS by vv+MDV 686. Our findings suggest that late-MDV-IS is a unique feature of vv+ strains.

Keyword: MDV; ILTV; Immunosuppression; Pathotype; Host sex