FLOCK IMMUNITY AGAINST MAREK'S DISEASE

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ABSTRACT

The flock immunity against Marek's disease in commercial layer flocks was assessed by Quantitative agargel immunodiffusion (QAGID) test. The mean QAGID titre ranges from zero to 3.7 and 10.4 to 22.4 in outbreaks and convalescent birds respectively. Dose, type and time of Marek's disease vaccination influence the quantum of humoral immune response during outbreak. Though the level of antibodies against Marek's disease virus (MDV) are not directly related with disease resistance, quantification of MDV antibodies is a useful tool in determining Herpes virus of turkey (HVT) viraemia, which is necessary for the induction of immunity.

KEY WORDS: Marek's disease, Herpes Virus of Turkey, Flock immunity

INTRODUCTION

Marek's disease is a disease of chicken characterized by lymphoproliferation and neoplasia of lymphoid tissue and continues to be a disease of major economic importance in commercial flocks throughout the world (Witter, 1971). It is caused by herpesvirus, belongs to serotype 1 MDV and is antigenically related to non-oncogenic herpesviruses of chicken (serotype 2) and turkeys (serotype 3); the latter is also known as herpesvirus turkey (HVT) (Zelnik, 2003).

Keeping these in view, the present study is envisaged to quantify the flock immunity against Marek's disease in the commercial layer birds.

MATERIALS AND METHODS

Twelve different MD outbreak layer flocks were selected (namely A to L) for assessing the flock immunity. The birds in flocks A, B, C, F, G, I, J and K were received monovalent vaccine (HVT) on day old as primary. The birds in flocks E and H were received bivalent vaccine (HVT+SB1) on day old as primary and second day of age as booster. The birds in flocks D and L were received bivalent vaccine (HVT+SB1) on day old as primary and fourth day of age as booster.

Twenty representative sera were collected from apparently healthy and clinically affected birds from each layer flock separately during outbreaks and during the phase of convalescence. All the sera were inactivated at 56ºC for 30 min and stored at - 20ºC for further processing.

Assessment of MDV antibodies by QAGID

Quantitative agar gel immunodiffusion (QAGID) test was performed to assess MDV antibodies as per the method described by Stone and Holly (1971) with slight modification. The gel was stained by using Amidoblack stain followed by destaining for 15-30 min. The destaining was performed repeatedly until the clear precipitation lines become visible.

RESULTS AND DISCUSSION

The mean QAGID titre of sera collected from birds of 12 different flocks during outbreak ranges from as low as zero to as high as 3.70. During outbreak, flocks which received one dose of monovalent vaccine on day old showed mean QAGID titre of 0.76, whereas flocks which received two doses of bivalent vaccine on day old and second day of age and day old and fourth day of age showed mean QAGID titre of 2.83 and 0.90 respectively. These findings are in accordance with the results of Witter and Lee (1984) who found that bivalent vaccine provided better protection than monovalent vaccine. Morrow and Fehler (2004) also observed that many veterinarians have agreed to administer two MD vaccines at different intervals in order

to reduce the risk of vaccination failure. This indicated that dose, type and time of MD vaccination influence the quantum of humoral immune response during outbreak.

The mean QAGID titre of 12 different flocks during convalescence ranges from as low as 10.4 to as high as 22.4. Birds in all the flocks had a high level of antibody titre when compared to the phase of outbreak, indicating that birds in all the flocks developed natural immunity. The findings of the present study are in agreement with Bankowski et al. (1970), Stone and Holly (1971), Witter et al. (1973) and OIE (2004) who reported that the birds will develop natural humoral immunity after infection.

In the present study, the levels of MDV antibodies are not directly related with disease resistance. However, quantification of humoral immune response is helpful in determing the level of vaccine virus present in the birds because the quantum of MD vaccine virus and humoral immunity are directly correlated. This is in accordance with the finding Witter et al., 1971, who have reported that the titre of precipitating antibody was not causally related to disease resistance; those chickens which developed high titres during the first 20 weeks of life generally lived longer than those which developed low titres and loss of precipitating antibody seemed related to the absence or diminished level of HVT viraemia. Hence, quantification of MDV antibodies is a useful tool in determining HVT viraemia, which is necessary for the induction of immunity.

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