THE EFFECT OF CD4$^+$ OR CD8$^+$ T CELL DEPLETION IN CHICKENS ON THE DEVELOPMENT OF MAREK'S DISEASE LYMPHOMA AND VACCINE PROTECTION

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Marek's disease (MD) is a lymphoproliferative disease in chickens which is characterized by T cell lymphoma formation and peripheral nerve enlargement. Many studies concerning host-immune responses against MD lymphoma formation have been carried out, however the role of cell-mediated immunity, particularly the involvement of T cell has not been clarified. In order to elucidate the roles of T cell subsets in lymphoma formation and vaccine immunity, T cell depleted chickens were established by thymectomy on day 2–3 and injecting T cell subset-specific monoclonal antibodies every 3 days.

Four 5 day-old chickens in each of 3 groups (control, CD4 or CD8-depleted) were challenged with MD virus (MDV) and the appearance of lymphoma and nerve lesions followed after 2 months. In the control group, 3 showed visceral lymphomas and one developed nerve enlargement. In the CD4-depleted group, 3 developed nerve enlargement and the remaining one showed neither lymphoma nor nerve lesions. None of the 4 chickens in this group had visceral lymphomas. In the CD8-depleted group, 2 showed visceral lymphomas and the other 2 developed nerve enlargement. All chickens in control and CD8-depleted groups showed a gradual increase of CD4$^+$ T cells in peripheral blood but the chickens in the CD4-depleted group did not. This evidence leads to the postulation that the existence of the CD4$^+$ T cell is essential for lymphoma formation induced by MDV.

Four chickens in each of the 3 groups (control, CD4 and CD8-depleted) which were vaccinated with attenuated MDV on day 1 were challenged by virulent MDV on day 5. None of the chickens showed gross pathological changes such as lymphoma formation and nerve enlargement. Flowcytometoric analysis of peripheral blood lymphocytes showed a gradual decrease in CD4$^+$ T cells.

This result suggests that vaccination with attenuated MDV might produce a repressive effect on MD lymphoma formation by decreasing CD4$^+$ T cells.