



Effect of determining protective antibodies on the efficacy of two types Newcastle disease vaccines in broilers

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Abstract

A total of 60 one-day-old Ross broiler chicks were used in this investigation. The birds were categorized into four groups, with each group including 15 birds. Group A was administered a 0.5 ml dosage of the LaSota live vaccination against Newcastle disease using the oral approach on the first day of their lives, using a 1 ml syringe. On the other hand, Group B got the dead vaccine by a subcutaneous injection. Group C was administered two distinct forms of vaccine: live and dead, whilst Group D was designated as the control group. On the 35th day, the birds were euthanized in order to obtain blood samples for the purpose of studying the impact of various vaccination types on the immunological response to the ND vaccine. The response was evaluated using an ELISA test. The findings demonstrated statistically significant differences ($P \leq 0.05$) in antibody titers between group B and the control group. Additionally, groups C and A exhibited substantial increases ($p < 0.05$) in antibody titers compared to the control group, which experienced a significant drop ($P \leq 0.05$) in antibody titers. Overall, the results indicated that the inactivated vaccine produced a higher level of antibodies. However, further evidence demonstrated that administering a live virus vaccination on the first day after birth resulted in the suppression of the mother's immune response by the vaccine virus. Hence, it is crucial to ascertain the antibody titer prior to determining the vaccine's course.

Keywords: Newcastle disease; Vaccines; Antibody Titers, broilers

Introduction

Newcastle disease (ND) is a globally prevalent viral virus that is extremely infectious and causes severe mortality in several species of domestic and wild birds. This is a result of the significant economic repercussions on the chicken business that occurred as a consequence of disease outbreaks. The sickness is caused by a paramyxovirus (1,2). Newcastle disease (ND) is distinguished by respiratory, digestive, and neurological symptoms. In extreme cases, the morbidity and death rates in vulnerable birds may exceed 100%. Birds that have not been vaccinated are particularly sensitive to the illness (3). Biosecurity and immunization have long been effective strategies in combating Newcastle Disease and mitigating its transmission (4). Chandrasekar et al. (5) stated that immunization protects the birds by generating both humoral and cell-mediated immune responses. Both of these reactions are crucial for comprehensive defense against infections. According to a study by (6), it has been shown that live vaccines given to chickens either eye drop or oral administration may stimulate the production of immunoglobulin (Ig)A antibodies, leading to the development of protective mucosal immunity. In contrast, Foltse et. al. (7) discovered that administering inactivated vaccines by injection resulted in the generation of substantial quantities of serum antibodies, so inducing humoral immunity that effectively protects chickens against viral infection. As stated in reference (8), inactivated oil emulsion vaccinations lack the ability to stimulate local immunity in the respiratory and digestive systems, which is a drawback when compared to live vaccines. However, they do confer protection,

although at a slower pace. Live vaccinations are less costly and easier to give compared to killed vaccines. Scientists have done several experiments in order to create a single yearly vaccination schedule that may effectively manage ND and decrease the expense of immunization. In Iraq, particularly in Basra, a range of vaccinations and schedules are used in chicken broiler houses to manage Newcastle Disease (ND). The objective of this research was to establish an immunization schedule that would enhance the antibody response and provide effective defense against ND.

Materials and Methods

In this study, 60 Ross broiler chicks, just a day old, were procured from Al-Qurnah Hatchery in Basrah Province. They were individually housed in cages within the experimental facility of the Department of Pathology and Poultry Diseases at Basra University's College of Veterinary Medicine. Stringent sanitation measures were adhered to, following standard management procedures. Throughout the entire experiment, the chicks had unrestricted access to pellet feed and water. The researchers cared for them for a span of 35 days.

Vaccine Strain

The live LaSota virus vaccine (commercially produced by FATRO) and the galimune inactivated vaccine virus of Newcastle disease vaccine (commercially manufactured by Merial) were administered following the instructions provided by the manufacturers.

Experimental design