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308 Lasani Town, Sargodha Road, Faisalabad - Pakistan
Mob: +92 300 3008585, Fax: +92 41 8815544
E-mail: editorijps@gmail.com

Clinical and Immunological Parameters of Newcastle Disease Vaccination in Chinese Goose (*Anser cygnoides*)

Josie Maria Campioni¹, Antonio Carlos Paulillo^{2,3},
Elizabeth Moreira dos Santos Schmidt^{2,4} and Márcia Nishizawa⁵

¹Aluna Programa de Pós-graduação em Medicina Veterinária da FCAV-Unesp, Jaboticabal, Brazil

¹Bolsista CAPES, Brazil

²Departamento de Patologia Veterinária, FCAV, Unesp, Jaboticabal, Brazil

³Research Fellow CNPq-Brazil

⁴Post-Doctorate Researcher (FAPESP), Departamento de Patologia Veterinária,
FCAV, Unesp, Jaboticabal, Brazil

⁵Docente, Universidade Metodista de São Paulo, São Bernardo do Campo, Brazil

Abstract: Clinical and immunological parameters of vaccinated Chinese goose against Newcastle disease were evaluated. One hundred and twenty birds were distributed into four different experimental groups, vaccinated or not against Newcastle disease (ND): G1 (Ulster 2C strain), G2 (B1 strain), G3 (LaSota strain) and G4 (nonvaccinated -control). The immune response was evaluated by the HI test. The vaccinations of Chinese geese with NDV Ulster 2C, B1 and LaSota strains did not cause any clinical signs associated with post-vaccinal reactions and were similar in the humoral immune response stimulus (HI).

Key words: Chinese goose, vaccination, newcastle disease, ulster 2C, B1 and lasota strains

Introduction

Chinese goose also known as the swan goose (*Anser cygnoides* Linnaeus, 1758, Anseriformes: *Anatidae*) is extensively kept as poultry. A large number of breeds have been selected in captivity, known as Chinese goose. Chinese geese differ from the wild birds in much larger size (up to 5-10 kg in males, 4-9 kg in females) and in having an often strongly developed basal knob on the upper side of the bill (Buckland and Guy, 2002).

Newcastle disease (ND) is an acute, highly contagious viral disease in birds, which can cause high level (up to 100%) mortality in chickens, the most important natural host of the disease, but it can also affect a variety of avian species, causing severe disease. The disease, regarded as being endemic in many countries, is caused by an avian Paramyxovirus type 1 (APMV-1), which is a member of the genus *Avulavirus*, of the *Paramyxoviridae* family (Mayo, 2002). Newcastle disease is one of the main sanitary barrier for the international trade of poultry and poultry products (Office International Des Epizooties, 1996). The disease is world-wide distributed in a large range of hosts, with 27 of the 50 orders of birds reported to be possibly infected by this agent (Kaleta and Baldauf, 1988). One of the affected species is the Chinese goose, which commercial production is extensively distributed in several countries around the world for meat, fine feathers and down for use in garment and household linen industries (Buckland and Guy, 2002). However, there is little information available on health programs in this species. Because of the potential of these birds to produce high nutritive meat and the

economic importance of feathers and down production the massive production of this species is increasing in many countries and this may cause high bird concentration in some areas that can lead to the dissemination of infectious diseases. The aim of this study was to evaluate the humoral antibody response and clinical parameters of China's geese vaccinated against Newcastle disease.

Materials and Methods

Experimental birds and management: A total number of 120 day-old Chinese geese were distributed into four different treatments of 30 birds each. Birds were designated to treatments, according to vaccination strain as G1 (Ulster 2C), G2 (B1), G3 (LaSota) and to treatment G4 (control group-not vaccinated). Chinese geese were allocated in experimental floor-pen housed, receiving water and feed ad libitum. The feed was formulated with corn and soybean according with NRC (1994) recommendations.

Vaccines: Commercial line NDV vaccines (Ulster 2C, B1 and LaSota strains) were administered to each experimental group, as described by Paulillo *et al.* (1996). Birds were vaccinated at seven days of age and revaccinated at 21 days of age with the same vaccine strain that was applied in the first vaccination. Vaccine titers were obtained by determining 50% of the embryo-infecting dose in embryonated eggs of specific-pathogen-free breeders at 8 and 10 days of incubation. Titters os live vaccine strains Ulster 2C, B1 and LaSota were 7.15 log₁₀/0.1mL, 7.2 log₁₀/0.1mL, and 7.35

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Table 1: Mean antibody titers measured by HI test (log₂) of Chinese goose (*Anser cygnoides*) submitted to different vaccination programs against ND

Group	Vaccine	Mean Antibody Titers measured by hi test (log ₂)						
		China's geese age(days)						
		7	14	21	28	35	42	49
G1	Ulster 2 ^c	0.0	0.0	4.0 ^b	30 ^{ad}	5.8 ^a	3.0 ^a	3.6 ^b
G2	B ₁	0.0	0.0	6.0 ^a	3.6 ^b	6.4 ^a	4.0 ^a	2.6 ^a
G3	LaSota	0.0	0.0	4.8 ^{ab}	3.0 ^a	4.2 ^a	3.2 ^a	2.8 ^{ab}
G4*	-	0.0	0.0	0.0 ^c	0.0 ^c	0.0 ^b	0.0 ^b	0.0 ^c

*Control group-not vaccinated against ND. 1-Means followed by the same letter, in the same column, are not different at 5% of probability by Tukey test (p>0.05)

log10/0.1mL, respectively. Birds were vaccinated and revaccinated by eye drop.

Serology: Blood samples of Chinese goose were collected from the ulnar superficial vein, from one to 60 days of age, at regular seven-day intervals. Sera were inactivated at 56°C for 30 minutes, frozen and stored at 20°C. Sera samples were submitted to inhibition of hemagglutination (HI) test, according to Cunningham (1971).

Results and Discussion

Chinese geese from all groups, vaccinated or not against ND, did not show any clinical signs of post vaccinal reactions. Mean antibody titers against NDV from Chinese geese are shown in Table 1. At seven days of age, none of the birds showed maternally-derived antibodies against NDV, as breeders were not submitted to any vaccination programs against this disease. As the control group (G4) was not vaccinated, its antibody titers were null from one to 60 days of age. At 21 days of age, antibody titers against NDV were detected in the vaccinated groups. This active immunity was induced by vaccination at seven days of age. Chinese geese were revaccinated at 28 days of age and this procedure maintained antibody titers against NDV up to 49 days of age. The low diffusion potential of the Ulster 2C strain (McFerran and Nelson, 1971) and the low invasion capacity of the B1 strain (Hofstad, 1951) may explain the low to moderate antibody titers detected by HI in vaccinated Chinese geese. On the other hand, the low antibody titers detected for the Chinese geese with the LaSota strain (G3) are not compatible with the great diffusion potential of this strain (Winterfield et al., 1957). The Tukey test did not demonstrate significant differences among groups vaccinated with Ulster 2C, B1 and LaSota strains. The analysis of these serological results clearly shows that Chinese geese produce antibody when vaccinated against NDV.

Conclusion: In conclusion, our study has shown that commercially available live ND vaccines for chickens induced a moderated antibody response in the Chinese geese, without any clinical signs of post-vaccinal reaction.

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