Detection of haemagglutination inhibition antibodies against Newcastle disease virus in unvaccinated indigenous chickens in Maiduguri, Borno State, Nigeria

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Summary: An examination of 200 serum samples from unvaccinated indigenous (local) chickens in Maiduguri, Borno State (Nigeria) using the haemagglutination inhibition (HI) test showed 73 sera to be positive and 127 to be negative for antibodies against Newcastle disease virus. The highest antibody titre observed was 1:128. The prevalence rate was higher (46.9%) in adult chickens than in young chickens of less than 12 weeks (23%). Presence of HI antibodies in unvaccinated indigenous chickens indicates that these birds had contracted infection and recovered thereafter.

KEYWORDS: Antibodies - Newcastle disease - Nigeria.

INTRODUCTION

Newcastle disease (ND) has been known to be endemic in Nigeria since the identification of the aetiological agent (8). An average of 130 ND outbreaks are reported in chickens each year. The prevalent field strains of Newcastle disease virus (NDV) causing outbreaks have been found to be highly virulent in character and are kept in circulation by wandering unvaccinated chickens and wild birds (1, 10). A study conducted in Zaria and environs revealed that 71.9% of the 160 sampled unvaccinated and healthy chickens were positive for haemagglutination inhibition (HI) antibodies against ND virus (7). Another study conducted in a group of 100 unvaccinated chickens in the Niger delta also indicated the presence of antibodies (17).

Commercial poultry production in Borno State is still in the developmental stage. Birds of local breeds are kept in small numbers, remain unvaccinated and are left to roam freely. From the available literature it appears that no work has been conducted to study the sero-epidemiology of NDV in this part of the country.

The present study was undertaken to detect the presence of HI antibodies in the sera samples of chickens brought to the Maiduguri market for slaughter.

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MATERIALS AND METHODS

Sampling

A total of 200 serum samples were collected from chickens slaughtered at the Monday market in Maiduguri. The sera were collected from unvaccinated chickens of various ages. All the chickens appeared healthy at the time of slaughter. The sera were inactivated at 56°C for 30 min and thereafter stored at 20°C until use.

Antigen

The Komorov strain of NDV was used as antigen, in the form of freeze-dried vaccine supplied by the National Veterinary Research Institute (NVRI) in Vom, Nigeria.

Reference serum

The positive standard reference serum was obtained from the NVRI.

Haemagglutination inhibition test

Presence of antibodies against NDV was detected by the HI test conducted in micro-titration plates as described by Allan and Gough (6). Serum samples showing an antibody titre of 4 or less were considered negative.

RESULTS

The HI test conducted on 200 local chicken serum samples showed 73 (36.5%) to be positive and 127 to be negative (antibody titres of 4 or less) for HI antibodies against NDV. The highest antibody titre recorded was 1:128.

Of the 200 serum samples studied, 113 originated from adult chickens, of which 53 (46.9%) were positive and 60 negative. The remaining 87 serum samples were from young chickens (less than 12 weeks old); of these, 20 (23%) were positive and 67 negative for HI antibodies.

DISCUSSION

The examination of 200 sera from unvaccinated indigenous chickens revealed the presence of HI antibodies against NDV in 73 (36.5%) of the samples. This finding confirms earlier work (7, 17) which reported that local unvaccinated chickens carry HI antibodies against NDV. However, these studies showed 71.9% of the 160 sampled birds (7) and all of the 100 sampled birds (17) to be positive reactors, which is much higher than the present finding. This could be due to the hot climate in Maiduguri, which might not be conducive to virus transmission. The presence of HI antibodies against NDV indicates that these birds had contracted infection and recovered thereafter. Indigenous chickens seem to be somewhat more resistant to ND than exotic birds; low susceptibility of local chickens in comparison to exotic chickens has been reported previously (14). Resistance to infection of local Nigerian birds has been attributed to the higher weight of the bursa of Fabricius (2).
The exotic poultry population in Nigeria is estimated at 10 million, while local poultry totals four times that figure (9). Unvaccinated diseased local poultry constitute a potential risk in transmission of the virus to vaccinated commercial exotic poultry.

Besides the unvaccinated local chickens in Nigeria, wild birds such as falcons and parrots have been found to be infected with NDV (12, 16, 18). The problem is further complicated by the fact that the prevalent virus strains in this country are velogenic (1, 3, 10, 18). Experimental transmission of ND to hens through pigeon faeces contaminated with NDV has been reported (4).

In addition, Gumboro disease is known to be prevalent in Nigeria (11, 15); outbreaks of ND are known to occur despite vaccination (13), and immunosuppression caused by subclinical infection with Gumboro disease is believed to be one of the factors which causes Newcastle disease in vaccinated flocks (5).

From the present study, it may be concluded that in order to control ND in Nigeria, vaccination of all poultry including indigenous chickens should be made compulsory. Combined vaccination against ND and Gumboro disease should be practised. Under no circumstances should commercial exotic chicken breeds be allowed to come into direct or indirect contact with local chickens. Rapid diagnosis and detailed epidemiological investigation should be conducted in all suspected ND outbreaks.

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**DÉTECTION DES ANTICORPS INHIBANT L’HÉMAGGLUTINATION DIRIGÉS CONTRE LE VIRUS DE LA MALADIE DE NEWCASTLE CHEZ DES POULETS INDIGÈNES NON VACCINÉS DE MAIDUGURI, ÉTAT DE BORNO, NIGERIA.**


**Résumé :** Deux cents échantillons de sérum prélevé de poulets indigènes non vaccinés élevés à Maiduguri (état de Borno, Nigeria) ont été soumis à l’épreuve d’inhibition de l’hémagglutination (HI) ; des anticorps contre la maladie de Newcastle ont été décelés dans 73 échantillons, mais non dans les 127 autres. Le plus élevé des titres d’anticorps observés était de 1/128. Le taux de prévalence était plus élevé chez les poulets adultes (46.9 %) que chez les poussins âgés de moins de 12 semaines (23 %). La présence d’anticorps HI chez des poulets non vaccinés montre que ces volailles avaient été atteintes de la maladie et qu’elles s’étaient ensuite rétablies.

**MOTS-CLÉS :** Anticorps - Maladie de Newcastle  Nigeria.

Resumen: El análisis de 200 dosis de suero provenientes de pollos locales no vacunados criados en Maiduguri, estado de Borno (Nigeria), mediante la prueba de inhibición de la hemaglutinación (HI) dio un resultado de 73 sueros positivos y 127 negativos a los anticuerpos dirigidos contra el virus de la enfermedad de Newcastle. El mayor título de anticuerpos observado fue de 1/128. La tasa de prevalencia fue más alta entre los pollos adultos (46.9%) que entre los polluelos de menos de 12 semanas de edad (23%). La presencia de anticuerpos HI en pollos locales no vacunados indica que las aves habían contraído en algún momento la enfermedad, pero que se recobrarán luego.

PALABRAS CLAVE: Anticuerpos Enfermedad de Newcastle Nigeria.

REFERENCES


