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PREVALENCE OF AVIAN LEUKOSIS VIRUS ANTIGEN AMONG INDIGENOUS CHICKENS IN TWO SUBURBAN COMMUNITIES OF THE FEDERAL CAPITAL TERRITORY, ABUJA, NIGERIA

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ABSTRACT

Avian Leukosis virus (ALV) is known to cause oncogenic diseases in chickens world over. This study aimed to determine the seroprevalence of ALV among indigenous chickens in Karmo and Gwagwa, two sub-urban communities in the Federal Capital Territory, Nigeria. A total of 180 indigenous chickens were tested for ALV p27 antigen using an Enzyme linked immunosorbent assay technique (Ringbio, Beijing China). The overall prevalence of ALV was 47.2 %, ALV was found to be higher among chickens in Karmo than in Gwagwa 54.1% vs.45.15, but this was not statistically different (Chi: 0.3917, P=0.531). This study envisages the establishment of an effective control strategy in our study area, because of known deleterious economic impact of ALV on chickens.

Key words: ALV, Indigenous chickens, ELISA, FCT.

Introduction

Avian leukosis virus (ALV), belongs to the genus *Alpharetrovirus* in the family *Retroviridae* (Meng *et al*., 2018). ALV causes neoplastic disease in poultry, the disease is characterized by B-cell lymphoma (Davidson, 2007). ALV are divided into 10 subgroups on the basis of differences in their viral envelope glycoproteins, which determine antigenicity, viral interference patterns with members of the same and different subgroups, and host range (Payne *et al*., 1992). Control of ALV infection is by detection and culling of infected individuals (Payne and Venugopaal, 2000). No vaccine is available for ALV (Payne and Venugopaal, 2000)

All strains of avian leukosis virus are known to be oncogenic, with differences in oncogenicity and replicative ability (Davidson, 2007). Economic losses from outbreaks of ALV have been documented in studies (Sadiq and Mohammed, 2017). The prevalence of ALV have been documented in certain parts of Nigeria and other parts of the World (Sani *et al*., 2011; Bande *et al.*, 2017), there is paucity of reports from markets in densely populated semi-urban areas of the Federal capital territory, Nigeria. This study aims to determine the seroprevalence of ALV in indigenous chickens sold at markets in Karmo and Gwagwa, Semi-urban areas of the Federal Capital Territory, Abuja, Nigeria.

Materials and methods

Study site

This study was carried out in Karmo and Gwagwa, two satellite towns in the Federal Capital Territory of Nigeria. Lying between latitude 8.25 and 9.20 north of the equator and longitude 6.45 and 7.39 east of Greenwich Meridian, Abuja is geographically located in the center of the country.

The Federal Capital Territory has a landmass of approximately 7,315 km^2, and it is situated within the Savannah region with moderate climatic conditions.

Experimental birds and Blood Sampling

Before sampling, verbal informed consent was obtained from all Bird sellers whose chickens were included in this study. Random sampling technique were used to include 180 Nigerian Indigenous chickens within the age range 4 to 24 months old from markets at Karmo and Gwagwa. One cloacal swab was collected from each bird. Swabs collected were transported in ice packs safely to the Molecular Biology and Immunology Laboratory of MDS Molecular Services, Abuja, Nigeria.

Screening for Anti-Leukosis Virus P27 Antigen

Avian Leukosis Virus (P27) Antigen was detected using Avian Leukosis Virus (P27) Antigen ELISA Kit (Ringbio, Beijing), following manufacturers instruction. This avian leukosis virus antigen ALV Ag ELISA kit is a sandwich ELISA kit to detect ALV p27 antigen in egg albumen, meconium and cloacal swabs. which is sensitive, fast and reliable. The ALV-Ag P27 ELISA kit is designed to detect P27 protein, the common and conservative protein of ALV virus, in various chicken samples. Thus, the kit can be used in testing of different groups of leukosis virus.

Principle of the Test

The ALV-Ag P27 ELISA kit is designed to detect P27 protein in various chicken samples. The microtiter plate is precoated with a P27 protein specific monoclonal antibody. During testing, samples are added into the microplate wells, in which the precoated antibody will capture the ALV in sample and formed antigen-antibody complex. None specific antigens are discarded by a washing step. Then another anti-P27 monoclonal antibody conjugate labeled with horseradish peroxidase (HRP) is added into each well, and further forms antibody-antigen-antibody complexes. After another washing step to remove unreacted conjugate, substrate is added and a blue color will be developed if P27 antigen is present. The enzyme reaction is stopped and the OD450nm value is measured. The measured intensity is positively proportional to the amount of P27 antigen present in the sample.

Quality Control

The test results are valid only if the Average OD value of negative control is below 0.250 and the Average OD of positive control is greater than 0.500.

Performance of Test

According to field test with over 500 samples, the sensitivity of the kit is 96.8%, and the specificity of the kit is 99.7%.

Statistical Analysis

The data obtained were analyzed using Chi-square (X^2) test for frequency data. The statistical software used for all analyses was SPSS v. 16(IBM Computer Manufacturing Company, NY, USA).

Results

This sero-prevalence of ALV P27 Antigen in Nigerian indigenous chickens in this study was 47.2% (85 of 180 birds). The prevalence of ALV was higher among indigenous chickens in Karmo market than those from Gwagwa Market 45.9% vs. 54.1%, though this was not significantly different (Table 1).

Table 1: Prevalence of ALV P27 in Nigerian indigenous chickens in Satellite towns of Gwagwa and Karmo, FCT.

Market	Sampled No of Birds	Frequency (%)	Chi	P value
Karmo	90	46 (54.1)	0.3918	0.531
Gwagwa	90	39 (45.1)		
Total Prevalence	180	85 (47.2)		

Discussion

Avian Leukosis virus is the aetiologic agent of Avian leukosis a well characterized oncogenic disease in poultry of negative economic importance (Payne and Venugopaal, 2000). This study evaluated the sero-status of Indigenous birds sold in two suburban communities in the Federal capital territory, Abuja, Nigeria. The prevalence of ALV P27 antigen was 47.2 %. The prevalence of ALV in our study sites was high, ALV has been reported to be highly prevalent in indigenous chickens, high ALV seroprevalence have been reported among indigenous chickens in some previous studies 60.0% in Zaria (Sani et al., 2011) and 58.3% in Nairobi, Kenya (Mihes *et al*., 20174).

Higher sero-prevalence of ALV has been reported among indigenous chickens in other parts of the world, local layer grandparent and local layer breeder had 80 and 76% ALV seroprevalence in Shiraz, Iran (Mohammadi *et al*., 2008). With the high prevalence of ALV recorded in our study area, control and eradication of ALV should been given priority. ALV prevalence is higher among local chickens when compared to broiler chicken; this is caused by free range management system employed in growing Local chickens (Saidu *et al*., 1994; Payne and Fadly, 2003).

Conclusion

The prevalence of ALV is high among indigenous chickens in sub-urban communities of Karmo and Gwagwa. This epidemiological data provides a support for the establishment of a coordinated prevention and control measures in our locality.

Conflicts of Interest

Nil

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