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Biological SciencesJournal homepage: www.Sjournals.com**Original article****Sero-prevalence of infectious bronchitis antibodies in local chickens in live bird markets in Sokoto State, Nigeria****H.U. Mungadi^{a,*}, U.M. Mera^b, Y.A. Adamu^b, U. Musa^c, C.R. Achi^a**^a*Veterinary Teaching Hospital, Faculty of Veterinary Medicine, Usmanu Danfodiyo University Sokoto, Nigeria.*^b*Department of Veterinary Medicine, Usmanu Danfodiyo University Sokot, Nigeria.*^c*Department of Veterinary Pathology, Usmanu Danfodiyo University Sokoto, Nigeria.*

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ABSTRACT

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A total of 161 apparently healthy male and female, grower and adult local chickens were sampled from Live bird Markets (LMB) in four Agricultural zones of the State; Gwadabawa, Tambuwal, Isa and Sokoto. They were screened for antibodies to infectious bronchitis virus using Enzyme linked Immuno Sorbent Assay (ELISA). The results obtained showed that the overall prevalence for the State was 89%, the seroprevalence was 88.89% in males and 89.00 % in females, 91.50% in adults and 70.00% in growers sampled. No significant difference was obtained between male and female chickens tested ($\chi^2 > 0.05$) but significant difference was obtained in adult and grower chickens ($\chi^2 < 0.05$). No routine vaccination against infectious bronchitis is usually carried out in the area; the high prevalence observed may suggest natural infection. Efforts should be made to determine strains of IBV circulating in the study area so as to enable the choice of appropriate vaccine.

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1. Introduction

Infectious bronchitis (IB) is an acute and highly contagious respiratory disease of chickens that is characterized by respiratory signs like gasping, coughing, sneezing, tracheal rales, and nasal discharge, it has been reported as a disease only in chickens of all ages; however, severity of disease varies (Whiteman and Bicford, 1996; Gary et al., 2009). In young chickens, severe respiratory distress may occur. In layers, there are respiratory distress, decrease in egg production and loss of internal egg quality and egg shell quality (Gary et al., 2009).

Infectious bronchitis is caused by Coronavirus; it is an enveloped, single-stranded RNA virus (Hopkins, 1974). The IB virus constitutes one of the most important viruses in poultry medicine because of its numerous serotypes (Hopkins, 1974; Johnson and Marquardt, 1975). Different serotypes of the virus do not cross-protect, however, some strains of the virus are quite effective at inducing cross protection against other serotypes and are referred to as protectotypes (Worthington et al., 2008). Some strains of the virus cause severe kidney damage and may be associated with high mortality (Whiteman and Bicford, 1996; Gary et al., 2009). High seroprevalence of IB were obtained in studies carried out in western part of Nigeria but information is not up to date about the disease in Sokoto State.

2. Materials and methods

A cross sectional study was carried out in some local government areas of Sokoto State covering the four Agricultural zones of the State (Isa, Gwadabawa, Tambuwal and Sokoto). A total of 161 Chickens were sampled from live bird markets across the state. One market was chosen in each zone where local chicken are sold in high number. These included; Sokoto central market (Sokoto zone), Achida market (Isa zone), Illela market (Gwadabawa zone) and Tambuwal market (Tambuwal zone). Local chickens were not usually vaccinated against poultry diseases in the study area; as such it was concluded that they had no record of vaccination against the disease.

2.1. Sample collection and preservation

Blood samples were collected from chickens in the selected live bird markets. (Achida market 63 samples, Illela market 34 samples, Tambuwal market 36 samples and Sokoto central market 28 samples). Sera were harvested and stored at -20°C .

2.2. Assay description

The X-OVO FLOCKSCREEN™ ELISA kit (X- Ovo Limited, United Kingdom), provides a rapid, simple and sensitive method of detecting antibodies to IBV in serum or egg yolk. Protocols in the manual provided by the manufacturer were followed to carry out the test and to interpret results.

2.3. Statistical analysis

The obtained data were statistically analyzed using chi square analysis at $P < 0.05$ level of significance.

3. Results and discussion

3.1. Overall prevalence

A total of 143 (89%) out of the 161 samples in Sokoto State were positive while 18 (11%) were negative, (Table 1). It is evident from this study that there is high prevalence of Infectious bronchitis in Sokoto State. Overall prevalence of 88.82% was obtained. This is lower but close to the prevalence of 90% obtained by Ducatez et al. (2004) where serum samples of 52 flocks from poultry farms in Nigeria were tested for the presence of Infectious Bronchitis Virus (IBV) antibodies. But it is higher than the seroprevalence of 84% reported by Owoade et al. (2006) in a serosurvey they conducted in south-western part of Nigeria in eight poultry farms. In 2010, Emikpe et al. also had a high seroprevalence of 82.7% after carrying out a serosurvey of antibodies to infectious bronchitis in 672 chickens in southwestern Nigeria. The high prevalence may be associated the highly contagious nature of the disease, its ability to spread to a considerable distance through aerosol and presence of carriers in the environment.

The Prevalence of Infectious bronchitis viral antibodies in male and female chickens sampled showed that positive results were more in males than in females. 90 males were sampled out of which 88.89 % tested positive, and 71 females were sampled and 89.00 % were positive. (Table2). The prevalence was found to be higher in males than in females tested which was statistically insignificant. But Gabriel et al. (1989) reported that there is less efficient immune response in male than female broilers due to the differences in the activity of humoral and cell mediated immune responses between the sexes.

The Prevalence of Infectious bronchitis viral antibodies in grower and adult chickens sampled showed that, out of 141 adult chickens sampled, 91.50% tested positive and out of 20 growers, 70.00% were positive. (Table 3) The higher prevalence in adults which was statistically significant might be associated with the fact that adults are more taken to markets hence more stressed and exposed to infections. This does not go in line with the work of Ducatez et al., (2004) where there was no significant difference in respect with age in chickens tested.

Table 1

Seroprevalence of infectious bronchitis virus antibodies in chickens in some local government areas of Sokoto State.

Local govt.	Number sampled	Number positive(%)	Number negative(%)
Sokoto	28	24 (85.71)	4 (14.28)
Tambuwal	36	32 (88.89)	4 (11.11)
Gwadabawa	34	33 (97.10)	1 (02.94)
Isa	63	54 (85.71)	9 (14.29)
Total	161	143 (88.82)	18 (11.20)

Table 2

Prevalence of infectious bronchitis viral antibodies in the two sexes of chickens sampled.

Sex	Number sampled	Number positive(%)	Number negative(%)
Female	71	63 (89.00)	8 (11.30)
Male	90	80 (88.89)	10 (11.12)
Total	161	143 (88.82)	18 (11.20)

There was no statistical significance with P value = 0.9950 (> 0.05).

Table 3

Prevalence of infectious bronchitis viral antibodies in different age groups of chickens sampled.

Age	Number sampled	Number positive(%)	Number negative(%)
Adults	141	129 (91.50)	12 (8.51)
Growers	10	14 (70.00)	6 (30.00)
Total	151	143 (88.82)	18 (11.20)

There was statistical significance with P value = 0.0070 (<0.05). Binary logistic regression test was carried out for age groups being the only variable that was significant with chi square and there was still significance with P= 0.0357 (<0.05).

4. Conclusions

This study demonstrated high seroprevalence (88.94%) of antibodies to IBV in the sampled chickens from selected local government areas of Sokoto State Nigeria. The prevalence in Adults was found to be higher than that in growers ($P < 0.05$), however the prevalence in males and females did not differ significantly ($P > 0.1$).

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