Seroprevalence of Infectious Bursa Disease Virus In Locaiy Bred Chickens In Lokoja, Kogi State.

'Abraham, O.J.[1'6], Onwtalttegwu, J. T.C.[4], Nwobodo,A.H,[}], Ngwu, B.A.F.[3], Chock J.J.[6], Yahaya, O.', Onuh, I.[1] and Eseyin,D.A'.

'Department of Science Laboratory Technology, Federal Polytechnic. PMB. 1037, Idah, Kogi State, Nigeria.
[1] Department of Microbiology, Enugu State University of Technology Teaching Hospital, Enugu, Nigeria.
[3] Dept of Microbiology and Pathology, Ebonyi State University, Abakaliki, Nigeria.
[4]Dept of Microbiology, Tansian University, Umunya, Anambra Stale, Nigeria.
[5] Dept of Botany, Federal University, Lafia, Nassarawa State, Nigeria.
[3] Dept of Medical Laboratory Science and Technology. Kaduna Slate University, Kaduna.
Phone: +2348062908906

Abstract: Infectious Bursa disease virus (IBDV) causes infectious Bursa Disease (IBD), an immuno-supprcsive disease of young chicken. Aserologica! survey of antibodies lolnfeciious bursa disease virus (IBDV) in unvaccinated local chickens in Lokoja, Kogi State, Nigeria was carried out to determine the prevalence rale of IBDV. Two millilitres (2ml) of blood was collected from each of two hundred and fifty (250) chickensby exsanguination at different point in Lokoja metropolis into sterile sample bottles. Sera preparedwere analysed usingagar gel immunodiffusion test. The seroprevalence of IBDV was 43.6% which is significant ($p < 0.05$). Introduction and sustenance of routine vaccination of local chicks against IBDV is highly recommended. Active surveillance of this virus should be conducted to define the true status of the virus in the state.

Key words: Infectious bursa disease virus, agargel Immunodiffusion,Infectious bursa disease, Haemagglutinating antibody, immunosuppressive disease, Seroprevalence,

Introduction

Infectious bursa disease virus (IBDV) is the etiologic agent of an acute, highly contagious and immuno suppressive disease (Infectious bursa disease) or Gumboro affecting young chickens of 3 to 6 weeks of age (Ahamad *et a/.,2005).* The virus causes destruction of lymphoid tissue, inflammation and atrophy of the bursa of fabricius and various degrees of nephroso-nephritis (Reddy *et al.,* 1997). Two distinct serotypes (1 and 2) of IBDV have been recognized. The serotype I, which displays a wide variation in pathogenic potential is virulent for chickens, whereas serotype 2 is virulent for turkeys (Mai *et a!.,* 1996). The virus is a member of the genus *Avibirnavirus* belonging to the family *Birnaviridae.* The genome of the virus is two segments (A and B) double stranded RNA. The virus is non enveloped and measures about 55-65 nm in diameter (Ibu *et at.,* 2000).

Infectious bursal disease virus was isolated from bursae of broilers suffering from Gumboro disease and was designated as field virus (FV) (Ahamader *al.,* 2005).The morbidity rate is very high and could reach 100%, whereas the mortality rate is within the range of 20 - 30%. However, highly virulent strain of infectious bursa disease virus can cause 100% mortality in specific pathogen-free chickens (Njagi *et al.,* 2010).

Josephoyiguh@yahoo.com"Abraham, O.J.

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The course of the disease is 5-7 days and the peak mortality occurs in the middle of this period. The virus is highly resistant to most disinfectants and environmental conditions. In contaminated premises, it could persist for months and in water, forage and faeces for weeks. The incubation period is short and the first symptoms appear 2-3 days after infection. Symptoms of IBDV are usually sudden with signs like, drop in feed and water consumption, watery droppings, vent pecking and soiling of feathers around vent. Also, diarrhoea, anorexia, depression, ruffled feathers, especially in the region of the head and the neck are present (Rajet *al.,* 2009). IBD is observed as long as chickens have a functioning bursa (up to the age of 16 weeks). IBDV can be transmitted by direct contact with contaminated people and equipment. Serological test such as agar gel precipitation and Enzyme-linked Immunodiffusion (ELISA) can be used for the detection of antibodies to IBDV (Ibu *etal.,* 2000).

The prevalence of Infectious bursal disease virus has been recorded in various parts of the worldlike Asia, USA and Ethiopia. In Nigeria, IBDV is prevalent in States like Yobe, Plcatcau, Sokoto and a few others. Huge economic loses have occurred to poultry farmers due to this virus and thus has been a source of concern to many researchers. Therefore this study was carried out to determine the prevalence rate of Infectious Bursal Disease vims in local chickens in Lokoja metropolis, Kogi Stale, Nigeria.

Materials and Methods

Study area

The study was carried out in five different markets (Old market, Fcllelc market, Ibro mini market, Adankolo mini market and Barrack market) in Lokoja, Kogi state. Lokoja is a confluence town where the two major rivers in Nigeria (River Niger and Benue) meet and flowed beside the eastern flank of the town to the southern part of the country. It is in the middle belt

region of Nigeria. It is also a small town which doubles as State capital and headquarter of Lokoja local government area (L.O.A) with an area of 561 cm^2 and a population of 139, 815 at 2006 census. Lokoja, an old river port, lies on the western bank of the river Niger at 7» 5' 0 "N. The major inhabitants are Igala, Ibira, Bassa Ngc (Barra), Nupe, Kakanda and a few smaller tribes, all of which are involved in peasant or subsistent farming, petty trading and fishing. Civil service is the major job of the people. The city is a transit town between the north especially the Federal Capital Territory, Abuja and the southern part of the country.

Samples collection

Two millilitres (2ml) of blood was collected by exsanguination (slaughtering) of 250 unvaccinated local chickens, which comprised of 50 chickens from each the five markets in Lokoja. Sera were prepared from the samples and taken to the Regional Laboratories for Avian Influenza and other Trans boundary Avian viruses. National Veterinary Research Institute, Vom, Plateau State for analysis.

Agar Gel Immunodiffusion (AGID) Test

Agar gel Immunodiffusion test was used to determine the seroprevalence of IBDV in the chickens' sera. Wells were cut in the agar using tubular cutter.Thc agar was removed from the wells using suction pump. The test sera were dispensed into the wells and standard antigen (IBDV) was dispensed into the central well.Standard positive antiserum was dispensed in the peripheral well opposite the standard antigen as positive control.Slandard negative antiserum was dispensed into one of the wells.The plates were incubated at room temperature for 24-48 hours in a humid chamber Io avoid drying the agar.The plates were examined in a dark background with oblique light source to identify lines between positive antiserum and standard antigen.Thcse were then compared with observations of the test wells and results recorded.

Data analysis

The prevalence of antibodies to Infectious bursal disease virus was calculated using the formula outlined by Bennette *et al.* (1991): Prevalence (%) = number of serum positive/total number of serum examined* 100. Prevalence was determined by analysis using test for proportion or Z-test.

Result

Seroprevalence of IBDV in local chickens in Lokoja, Kogi State

The results of the study showed that 13 samples were positive from the chicken at old market with a prevalence rate of 26%. From Fellele market, 27 of the samples were positive giving a prevalence of54%. Samples obtained from Ibro mini market, Adankolo mini market and Barrack market showed that 31(62%) samples, 21 (42%) samples and 17 (34%) samples respectively were positive for IBDV. The total prevalence rate established in this study was 37.2% as shown in the table.

Table showing Seroprevalence of IBDV in Loko ja

Market	No of sample	No positive	% positive
Old market	50	13	26%
Fellele market	50	27	54%
Ibro mini market	50	31	62%
Adankolo mini market	50	21	42%
Barrack market	50	17	34%
TOTAL	250	109	43.6%

Discussion

From the table, the sero-prevalence rate of IBDV in Lokoja was 43.6%. This is lower compared to a similar work carried out by Razmyar *et al.* (2009) where he obtained a seroprevalence rate of 89.7% in Abeokuta. The difference in the prevalence of IBDV in different locations in Lokoja was found to be significant ($P<0.05$).However, the result of this study is similar to that of Zahoor *et al.* (2010) in a study conducted to determine the prevalence of infectious bursal disease virus (IBDV) at different ages of commercial boilers in which 43.45% prevalent rate was obtained using RT-PCR.

within a given flock a permanent phenomenon (Sule *et* a/., 2013).

This study shows that local breeding and commercial poultry farming and protein requirement of the people of the area and its environs may be affected. Regular surveillance for infectious bursal disease antibodies as well as examination of the risk factors associated with the disease in village chickens is recommended to enable the institution of a suitable control program. Also recommended is vaccination of village chickens to confer protection to susceptible birds.

The occurrence of antibodies to Infectious bursal virus in village chickens is suggestive of a high viral activity that may have a significant implication in the epidemiology of the disease in commercial poultry which are sometimes reared in close proximity to village chickens (Sule *et al.,* 2013).It is probable that the high virus activity obtained in this study was due to horizontal transmission that occurredaround the many garbages generated by the densely populated settlements and the rearing of various age groups of chickens together. The rearing of village chickens of different age group together could make the infection

Conclusion

The seroprevalence rate of IBDV in Lokoja was high. Vaccination of all local chickens should be encouraged. Infected local chickens should not be allowed to come into direct or indirect contact with uninfected ones. Birds showing symptoms of IBD V should be quarantined immediately. Implementation of a comprehensive bio security programmes should be put in place. Government should embark on enlightenment programmes to educate the people on the danger of IBDV and possible control measures to prevent outbreaks or spread of the virus.

Reference

Ahamad, A.N., Hussain Siddique, M. and Mahood, M.S. (2005). Adaptation of Indigenous infectious bursal disease virus (IBDV) in embryonated egg. *Pakistan Vet. J..* 25 (2): 531 -540

Bennette, S., Woods, T., Liyanage, W.M. and Smith, D. L. (1991). A simplified general method for cluster sampling surveys of health in developing countries. *World Health Statistician Quarterly.* 44: 98-106.

Emikpe, B.O., Ohore, .O.G., Olujonwo, M. and Akpavie, M. (2010). Prevalence of Antibodies to Infectious Bronchitis Virus (IBV) in Chicken in Southwestern Nigeria. *African J. Micro Research.* 4(1): 092- 095.

Ibu, O.J., Aba-Adulugba, A., Adeleke, M.A. and Tijjani, A.Y. (2000).Activily of Newcastle disease and infectious bursal disease vintscs in ducks and guinea fowls in Jos area, Nigeria. *Sokoto J. Vet. Sci.,* 2: 45-46.

Mai, H.M., Ogunsola.O.D. and Obasi, O.L. (2004). Serological Survey of the Newcastle Disease and Infectious Bursal Disease in Local Ducks and Local Guinea Fowls in Jos, Plateau State, Nigeria. *Revue* A/ev. *Med. Vet. Pays Trap.* 57 (1-2): 41-44

Njagi, L.W., Nyaga, P.N., Mbuthia, P.G., Bebora, L.C., Michieka, J.N., Kibe, J.K. and Minga, U.M. (2010). Prevalence of Newcastle disease virus in village indigenous chicken in varied agro-ecological zone in Kenya. *Livestock Research for Rural Development.* 22(5): 231- 348.

Raj W.K, Farhan. A.K, Kamran ,F, Izhar. K, and Muhammad, T. (2009). Prevalence of Infectious Bursal Disease in Broiler in District of Peshawar. *ARPN Journal of Agricultural and Biological Science.* 4:001-020

Razmyar, J. and Peighambari, S.M, (2009). Isolation and Characterization of a very Virulent Infectious Bursal Disease Virus from Turkey. *Acta Virol.,* 53: 271-276.

Tesfaheywet .Z. and Getnet .*F.* (2012).Seroprevalence of infectious bursal disease in chickens managed under backyard production system in Central Oromia, Ethiopia. *Afr. J. Microbiol.* Res 6(38): 6736-6741,

Tran Q.V, Lohr. J.E, Kyule, M.N., Zessi, K.H. and Baumann, M.P.O. (2012): Antibody Levels against Newcastle Disease Virus, Infectious Bursal Disease Virus and Avian Influenza Virus in Rural Chickens in Viet Nam. *International Journal of Poultry Science.* 1 (5): 127-132,

Zahoor, M. A., Abubakar, M., Naim, S., Khan, Q. M. and Arshed, M. J. (2010): Incidence and Molecular Characterization of Infectious Bursal Disease Virus in Commercial Broilers in Pakistan. *International Journal for Agro Veterinary and Medical Sciences,* 4(3): 75-80.

Sule, A. G., Umoh, J.U., Abdu, P.A., Ajogi, J., Jibrin, U.M., Tijjani, A.O., Atsanda, N.N. and Gidado, A.S. (2013). A serological survey for infectious bursal disease vims antibodies among village chickens in Yobe State Nigeria. *International Journal of Agriculture Sciences.* 3(7): 596-598.