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Extended Abstract
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Seroprevalence of Infectious Bursal Disease in Non-vaccinated Village Chicken in Jigjiga and Harar Districts, Eastern Ethiopia

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Abstract

Cross-sectional study was carried out from October 2014 to April 2015 to determine the sero-prevalence of infectious bursal disease (IBD) in non-vaccinated village chickens of Jigjiga and Harrar Districts, Eastern Ethiopia. A serum sample was taken from 431 village chickens reared in a traditional management system in the study area. In the present study Indirect enzyme-linked Immunosorbent assays was employed to determine the seroprevalence of IBD. In the current study an overall seroprevalence of 51.7% (223/431) with an optical density (OD) reading between 0.29-0.780 nm was recorded. The study also revealed that seropositivity to IBD virus was significantly influenced by location ($\chi2=23.791$, $P<0.05$). But no significant difference was observed between age groups ($\chi2=13.959$, $P=0.999$), sex ($\chi2=17.793$, $P=0.153$) and breed ($\chi2=15.004$, $P=0.553$) on the prevalence of IBD. This study concluded that IBD is widely distributed in the current study area, thus detailed surveillance should be carried out in order to put in place appropriate control and prevention strategies.

Keywords: Chickens; ELISA; Infectious bursal disease; Seroprevalence

Sample size determination and sampling method

Since there was no prior similar research work conducted in the study area, expected prevalence was assumed to get the maximum number of sample size required. The absolute precisions were decided to be 5% at 95% confidence level. Thus, for sample size estimation, the formula described by Thrusfield et al. was used. Accordingly, a sample size of 384 was obtained using formula. However, the sample size was increased by a factor (0.12) to increase the precision of study as well as to compensate for loss of blood samples thereby making the total number of chickens to be 431. Selection of sample was made using a deliberate unbiased process. So, multistage cluster sampling procedure was followed to get sampled birds. This was conducted by dividing the study population into exclusive groups and then number of sampling units selected from each stratum. Study sites were selected based on the existing epidemiological situations and following the route of poultry dissemination from multiplication centers. Accordingly, the 431 chickens were systematically selected from 7,358 chickens in the backyard production system of the selected Pas/kebeles. Systematic sampling methods were applied after sampling interval was determined using the formula K=N/n. Where: N=represents estimated total chickens for backyard farm in sampling frames; n=allocated sample size and K=interval of household to be sampled (Pfeiffer, 2002). Accordingly, at every 17 household intervals a chick was caught and examined.

Laboratory diagnostic methods

ELISA test procedure, validity and interpretation: Enzyme-linked Immunosorbent assays (ELISA) was performed at the National Veterinary Institute (NVI), Deber-zeit, Ethiopia, using a commercial available blocking ELISA kit (Proflock plus infectious bursal disease virus (IBDV) antibody test kit) to detect specific antibodies against IBDV according to the manufacturer's manual. Briefly, both the sera samples that were preserved at -200°C, the antigen reagents that was preserved at 40°C were adjusted to room temperature of 22-27°C prior to the test. All the serum samples were heat inactivated at 560°C for 30 minutes in a water bath (Rahman et al., 2004). Sera samples were diluted by adding 500 µl of the sample diluents to each 1 µL of the serum sample prior to the assay using pipette with disposable tips. 100 µl of diluted sample was added into each wells and 100 µL of undiluted negative control into well A -1 and well A -2, and 100 µL of undiluted positive control into well B-1 and well B-2, the plate was then covered with lid and incubated at room temperature of 220°C for 30 minutes later on the contents of wells were aspirated and each well was washed with 300 µl of wash buffer for 4 times and wells in which 100 µl of the conjugate reagent was added into each well and the plate was covered

with lid and incubated at room temperature of 220°C for 30 minutes, the contents of the wells were then aspirated and washed 4 times and the plate was inverted and taped firmly on absorbent cloth to dry. Another 100 µl of the substrate reagent was added into each well and the plate was covered with lid and incubated at room temperature of 220°C for 15 minutes, after which 100 µl amine buffers was added into each well. The absorbance values were measured and recorded at wavelength 450 nm using spectrophotometer. The IBD antibodies titer and sample absorbance to sample to positive ratio were calculated to interpret the results according to the manufacturer's instructions.

Conclusion

The present study revealed a high seroprevalence of IBD in the study area, which could seriously affect the rearing of chickens in the backyard production system. The disease was found to have a higher seroprevalence in Jigjiga than Harar, which requires a serious attention. Hence, advising famers to get their chickens vaccinated is a necessary step in reducing the prevalence besides maintaining hygienic condition of environment in which the chickens are reared. Furthermore, it is important to fully characterize and identify the strains of viruses through sequencing of the circulating viruses in the areas and continuous surveillance should be implemented for better understanding of the epidemiology of the diseases.

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