A SEROLOGICAL SURVEY FOR NEWCASTLE DISEASE VIRUS ANTIBODIES IN BACKYARD CHICKENS OF CHITWAN, NEPAL

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Abstract: *The research was conducted at Chitwan district of Nepal to investigate the serological prevalence for Newcastle disease virus antibody in backyard chickens of Chitwan. The total blood serum sample of 300 were collected in which 150 samples were form Mangalpur VDC and 150 from Jagatpur VDC of Chitwan from unvaccinated backyard chickens. The samples were then tested serologically by HA and HI test (OIE manual, 2012) by using F_1 vaccine (manufactured by Tripureshwor Laboratory, Nepal) as antigen. Out of 150 samples from Mangalpur, 52 sample (34.66%) samples were found to have positive antibody titre of Newcastle Disease Virus (NDV) whereas out of 150 samples from Jagatpur, 67 samples (44.66%) were found to have positive antibody titre. Result of study showed no significant difference in sero-prevalence of NDV among the different location and sex whereas there was highly significant ($P<0.05$) difference in prevalence on the NDV among the different age group in which high prevalence rate was seen in the chickens of age above 12 months. It was concluded that the prevalence (39.66%) of NDV in backyard chickens is high and are under risk of high mortality due to ND outbreaks. Therefore it is recommended to aware the farmer to vaccinate their backyard chickens against New Castle Disease (ND).*

Key Words: *Newcastle disease, antibody, backyard, chicken.*

1. INTRODUCTION:

Newcastle Disease (ND) is a viral disease if birds caused by a filterable virus Newcastle Disease Virus (NDV) which belongs to the family Paramyxoviridae (Alexander, 1997). It is contagious disease of poultry which has peracute, acute and sometime subclinical form (Health *et al*., 1991). ND is one of the fatal disease of poultry in which mortality reaches up to 100% (Alders and Spreadbrow, 2001; Saidu and Abdu, 2008). The infection of ND virus takes place through inhalation or ingestion and spreads from one birds to another depends upon the availability of virulent infectious form of the virus (Whiteman and Bickford, 1983) and its short incubation period of 5-6 days (Chansiripornchai and Sasipreeyajan, 2006). New castle disease affects usually nervous, respiratiory and gastrointestinal systems with signs of respiratory rales, greenish to yellowish diarrhea and weakness followed by prostration and death (Chansiripornchai and Sasipreeyajan, 2006).

ND is responsible for great economic losses to the farmers every year. Quarantine, vaccination and bio-security are the only tools to combat this problem. Vaccination against ND is not practiced in backyard poultry of the country. No detailed seroprevalence studies have been conducted regarding ND in rural poultry. This research was therefore, designed to determine the seroprevalence of ND in rural poultry. The results are hoped to help in control of the disease in rural poultry. Study area (Chitwan) is an geographical hub of commercial broilers and layers as well as back yard poultry population. The aim of this research is to study the seroprevalence of New castle disease in the backyard chickens of Mangalpur and Jagatpur VDC of Chitwan District of Nepal**.**

2. MATERIALS AND METHODS:

Chitwan is considered as poultry hub for Nepal where it contributes 60% of total production of poultry. A cross-sectional serological survey of free ranging back yard poultry was carried out in Mangalpur village development committee (VDC) and Jagatpur VDC of Chitwan. Jagatpur VDC is considered as buffer zone of Chitwan National Park where backyard poultry birds comes in contact with Wild birds most often. A total of 300 semi-intensive backyard poultry blood samples (150 samples from each VDC) were taken. 5ml blood were collected from each poultry birds by vacutainer blood collecting tube. Then it was carried to Veterinary Teaching Hospital of Institute of Agriculture and Animal Science. Then the tube were centrifuged at 3000 rpm for 20 minutes for serum separation. Then the serum was extracted by micropipette and kept into 2 ml serum vial and stored at -20 ^{o}C in freezer. Then the sample is thawed at room temperature and then taken to department of Microbiology for Haemaglutination inhibition test for detection of antibody of New Castle virus. This test was carried out as per the OIE manual, 2012. All the data were tabulated in Microsoft Excel Data Sheet (Version 2007). And statistical analysis was performed using Open-Epi software tool. A chi square test at 95% level of significance was used to compare risk factors.

3. RESULT:

Table 1: Sex wise distribution of ND antibodies in backyard poultry

Sex	Positive	Negative	Positive %	Odd-ratio	p-value
Female	91	127	41.74	1.38	0.23
Male	28	54	34.14		
Total	119	181			

Table 2: VDC wise distribution of ND antibodies in backyard poultry

Place (VDC)	Positive	Negative	Positive %	Odd-ratio	p-value
Jagatpur	67	83	44.66	1.52	0.07
Mangalpur	52	98	34.66		
Total	119	181			

Table 3: Age wise distribution of ND antibodies in backyard poultry

Age (months)	Positive	Negative	Positive %	p-value
0-6	28	48	36.84	0.0013
6-12	49	102	32.45	
>12	42	31	57.53	
Total	119	181		

A total of 300 serum samples were subjected to HI test. Out of which 119 serum samples were found positive for seroprevalance of ND antibodies with positive percentage of 39.66%. The seroprevalence among male and female was found to be non-signifacant ($p>0.05$) with female to male seroprevalance ratio of 1.38:1. Out of 150 samples from each VDC, 67 (44.66%) from Jagatpur was found to be positive whereas 52 samples (34.66%) form Mangalpur was found to be positive. However there was no significant difference among two different VDCs. Seroprevalence among age wise was statistically found to be highly significant ($p<0.01$) in which there was higher seroprevalence in birds above 12 months (57.53%) whereas lower in birds of 6 to 12 months (32.45%).

4. DISCUSSION:

The present study indicate that New castle disease (NCD) is endemic in the studied area. The prevalence of NCD was found to be 39.66% which is higher than the findings of Dhakal, 1999 (29%). The prevalence ranges from 34.66% to 44.66% in the study area which agrees with the finding of various findings in Nepal. In the similar study Youngolo (1996) reported a variable sero-pervalence fo 25-81.5 %. Similarly Ibitoye (2013) has reported a 72% sero-prevalence of antibodies to NCD virus in traditionally managed non-vaccinated village chickens in Nigeria. The significant sero-positive rate of NCD in village chickens in the present investigation is indicative of the continuous infection pressure. This might be because of the free ranging management system that allows the uninterrupted cycle of infectious as the virus passes from one to the another. The chickens are also prone to acquire infection from wild birds. The open local markets where huge numbers of chickens are gathered might also serve as continuous foci of infection of disease. With this infection, there can be high morbidity and mortality to backyard poultry which leads to huge economic loss of marginalized farmers. Along with that it might affects the food security, especially protein of animal origin. Similarly, NCD virus in backyard poultry can also produce threats to commercial poultry farm.

5. CONCLUSION:

This study showed that the backyard chickens are at high risk of New castle disease virus of all age groups in both the sexes. So government should aware the farmers to vaccinate their backyard chickens against the New castle disease through radio, television, newspaper, leaflets.

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