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RESEARCH ARTICLE

Seroeprevalence of infectious bronchitis in Ranchi Jharkhand

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Abstract : ELISA and AGID based seroprevalence study of 92 suspected poultry samples in and around Ranchi district of central and western plateau agro-climatic zone in and around Ranchi district, Jharkhand during 2014-15 were 93.48 per cent and 53.26 per cent, respectively. The sensitivity and specificity of AGID was 52.33 per cent and 33.33 per cent, respectively taking ELISA as gold standard test. ELISA and AGID were found significant on standard method of statistical analysis. As per available literature seroprevalence of IB has not been reported by any worker from Ranchi, Jharkhand, however individual cases had been reported. It seems to be the first report from this area which clearly indicates extremely high IB seroprevalence without showing gross pathological lesion.

Key words : AGID, ELISA, IB, Seroprevalence

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INTRODUCTION

The infectious bronchitis virus (IBV) is highly contagious, farm devastating disease in chickens, belongs to genus *Gammacoronavirus* of the *coronaviridae* family (Abdel-Moneim *et al*., 2006).

IBV primarily targets the epithelial cells of the respiratory, urinary and reproductive tracts in the domestic chicken at 3 weeks of age. Nephrogenic IBV in Southeast Asia and variant form of nephrogenic IBV in Middle Eastern part is seroprevalent (Balasubramaniam *et al*., 2013).

The multi-systemic infection in chickens by IBV is very much similar to other poultry pathogens thus to get a high diagnostic accuracy a series of laboratory assays is required. Preferred methods for IB detection are serum neutralization (SN), dot blot ELISA, indirect immunofluorescence, micro HI, virus neutralization (VN) test, isolation in SPF eggs, S1 gene sequence analyses, HA, I-ELISA, dot-ELISA, restriction fragment length polymorphism and nucleotide sequencing, Indirect immunoperoxidase test, RT-PCR, yolk serology and HI (Mukhopadhayay *et al*., 2000; Abdel-Moneim *et al*., 2006 and Balasubramaniam *et al*., 2013).

There is recurrent occurrence of renal gout and nephritis syndrome in poultry of Ranchi, Jharkhand. Nephrogenic IBV is suspected to be the underlying factor in addition to mycotoxicosis (Ochratoxin A), Vitamin-A deficiency and protein malnutrition. The present work was planned to monitor IB seroprevalence from the suspected broiler birds in

Ranchi, Jharkhand using ELISA and AGID with comparative assessment of efficacy of AGID with ELISA.

RESEARCH METHODOLOGY

Collection of samples :

The blood samples were collected from 92 chickens from age group of 2-8 wks from suspected cases from Ranchi during January 2014 to April 2015.

ELISA:

Enzyme-linked immunosorbent assay (ELISA) was carried out by The FLOCKSCREEN™ Infectious Bronchitis Virus Antibody ELISA Test Kit, U.K. The results were interpreted as: Non significant for IB if S/P ratio is less than or equal to 0.102 or IBV titre is 0-1113, Marginal positive for IB if S/P ratio is greater than 0.102 and less than 0.166 or IBV titre is 1114-1528 and Positive for IB if S/P ratio is greater than or equal to 0.166 or IBV titre is 1528 or greater.

AGID:

This technique was based on the ability of antibodies to form precipitation lines specifically with the antigen. Free diffusion of both the antigen and antibody takes place in agarose gel resulting in precipitation lines, which were visible to the naked eye. The procedure was followed as per Ouchterlony (1948) with some modification. Sensitivity and specificity of AGID were calculated, considering ELISA as reference test as per Lalkhen and McCluskey (2008). Statistical analysis between ELISA and AGID was done as per Snedecor and Cochran (2004).

RESULTS AND DISCUSSION

IB Seoprevalence has so far not been reported from this area. The study conferred IB seroprevalence using ELISA and AGID as 93.48 per cent and 53.26 per cent, respectively. In Jharkhand, for the first time, ELISA technique was used for IBD seromonitoring. Sensitivity and specificity are very important parameter to judge accuracy of the test. However, the sensitivity and specificity of the AGID assay was lower compared to ELISA as standard *i.e*. 52.33 per cent and 33.33 per cent, respectively which was also in accordance with Robert *et al*. (2004) (Table 1). On the basis of Chi-square (χ^2) test, difference in efficacy for detection of infection by ELISA and AGID were found significant (Table 2).

Seroprevalence of IB has been reported by several workers from India and abroad even in the apparently healthy birds (Mukhopadhayay *et al*., 2000 and Hussain *et al*., 2005). In the present study, IB seroprevalence has been reported on the basis of ELISA and AGID as 93.48 per cent and 53.26 per cent, respectively, while the

Table 1 : Relative performance of AGID to ELISA for IB

Test		ELISA (reference test)		
AGID	Results	Positive	Negative	Total results
	Positive	45(TP)	4(FP)	49(dot-ELISA +ve sample)
	Negative	41(FN)	2(TN)	43(dot-ELISA -ve sample)
	Total results	86(ELISA +ve sample)	6(ELISA -ve sample)	92(Total sample)

Relative sensitivity = 52.33 per cent, Relative specificity= 33.33 per cent

Table 2 : Chi-square test for ELISA and AGID

Result/Technique	ELISA	AGID	Total	χ^2
Positive	86	49	135	
Negative	6	43	49	38.08**
Total	92	92	184	

* and ** indicate significance of values at P=0.05 and 0.01, respectively

prevalence rate of disease was also reported through ELISA by Mahzounieh *et al*. (2006); Das *et al*. (2009) and Emikpe *et al*. (2010) as 85.3 per cent in Iran, 100 per cent in Gajipur of Bangladesh, 82.7 per cent in southwestern Nigeria, respectively.

But, during the study we found no gross pathological lesion which indicates mild form of viral infection. So, mild form cannot be only ignored and good care should be taken to avoid an epidemic or pandemic outbreak and differentiation from other disease.

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