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SEROSURVEILLANCE OF CHICKEN INFECTIOUS ANAEMIA (CIA) BY LATEX AGGLUTINATION TEST IN TAMIL NADU

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Abstract: Chicken infectious anaemia virus (CIAV), belonging to genus Gyrovirus of Circoviridae family is the etiological agent of the disease Chicken infectious anaemia. The virus has worldwide distribution and the typical characteristics have made it an economically important avian pathogen. In this study, the presence of antibodies against CIAV was examined in commercial layer, broiler breeder and layer breeder birds by Latex agglutination test (LAT) from the poultry flocks in Namakkal and Tiruppur districts of Tamil Nadu. Out of 450 samples screened from a total of 18 farms, 391 samples (86.9 %) were found positive by LAT. Seroprevalence of 71.73%, 93% and 93.86 % from commercial layer, layer breeder and broiler breeder birds were detected.This study demonstrated high seroprevalence of CIAV in Namakkal and Tiruppur districts of Tamil Nadu.

Keywords: Chicken infectious anaemia virus, Serosurveillance, Latex agglutination test.

Introduction

Chicken infectious anaemia (CIA) is an immunosuppressive disease primarily of young chickens, but it also infects the chickens of all age groups. It causes lower viability and production performance by making birds more susceptible to secondary infections, which make the existing disease more severe and results in many complex diseases. The clinical disease is mainly noticed in young chicks of 10-14 days of age, which usually acquire the infection vertically. The disease is characterized by increased mortality, reduced weight gain, aplastic anaemia, aplasia of bone marrow and atrophy of thymus (McNulty, 1991; Rosenberger and Cloud, 1998).

Antibodies to CIAV in chicken sera could be assessed by enzyme-linked immunosorbent assay (ELISA) and latex agglutination test (LAT) (Davidson *et al.* 2004; Farhoodi *et al.* 2007). In Tamil Nadu, Udhayavel *et al.* (2013) reported that antibodies to CIAV can be assessed by use of a commercially available competitive ELISA Kit. They found 84.4 per cent of seropositivity in Tamil Nadu, India. The present study was aimed to find out

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serosurveillance of CIA in Namakkal and Tiruppur districts of Tamil Nadu by Latex agglutination test (LAT).

Materials and Methods

Sera samples

The sera samples were collected from commercial layer farms, broiler breeder farms and layer breeder farms in and around Namakkal and Tiruppur districts of Tamil Nadu. From 18 flocks with different age of chickens, 450 sera samples were collected. These flocks were 5 commercial layer (5-48 weeks of age), 8 broiler breeder(0-50 weeks of age) and 5 layer breeder(14-44 weeks of age).From each flock 20 to 25 serum samples were taken.

Latex agglutination test (LAT)

Sera were tested for CIAV specific antibodies using the CIAV LAT kit developed at the Dept. of Animal Biotechnology, Madras Veterinary College. The LAT was performed as described in manufacturer's instruction manual as follows. 20 µl of CIAV VP1 coated latex beads were added to all the wells of VDRL plate. 20 µl of positive, negative and test serum sample were added in the representative wells. Then mixed uniformly and observed for five minutes to read the results.

Results and discussion

Latex agglutination test is a welcome technique for the serodiagnosis of several virus infections. LAT was used for serodiagnosis of fowl adeno virus subtype 4 (Kalaiselvi *et al.,* 2010) and also for the detection of avian influenza virus subtype H5N1 (Jianfeng *et al*., 2007).But report on the use of this technique for detection of CIAV antibodies or antigens are scanty. In this study, LAT was used to detect antibody to CIAV. Out of 450 sera samples collected from 18 farms, 391 (86.9 per cent) were found positive while 59 (13.1 per cent) were observed negative.

Among 138 sera collected from a total of five commercial layer farms, 99 (71.73 per cent) were found positive (Table 1). Due to horizontal infection of CIAV, 32.75 per cent seroprevalence might be noticed in 6-10 weeks commercial layers. The positive percentage of 11-20 weeks, 31-40 weeks and 41-50 weeks aged commercial layers were found to be hundred per cent. This finding was higher than the results obtained by Huseyin *et al*. (2008) in which they found seropositivity of 93.7 per cent in layer flocks. Illegal vaccination of commercial layers against CIAV might be the reason for the higher percentage of seropositivity in commercial layers.

In layer breeders, out of 100 sera collected from a total of five layer breeder farms, 93 (93 per cent) samples were found positive(Table 2). The sera collected from 21-30 weeks and 31-50 weeks were 90 per cent positive while sera from 11-20 weeks were 95 per cent positive. But 100 per cent seropositivity in layer breeders was also documented by Huseyin *et al*. (2008).

In broiler breeders, out of 212 samples screened 199 (93.86 per cent) sera were found positive (Table 3). The positive percentage of 11-20 weeks, 21-30 weeks and 31-50 weeks aged broiler breeders were found to be 100 per cent. This is highly accordance with the previous report of Huseyin *et al*. (2008) in which 100 % seropositivity was documented in 20 to 50 weeks aged broiler breeders.

References

[1] Davidson, I., Kedem, M., Borochovitz, H., Kass, N., Ayali, G., Hamzani, E., Perelman, B., Smith, B. and Perk, S., 2004. Chicken infectious anemia virus infection in Israeli commercial flocks: virus amplification, clinical signs, performance, and antibody status. *Avian Dis.,* **48:** 108-118.

[2] Farhoodi, M., Toroghi, R., Bassami,M.R. and Kianizadeh, M., 2007. Chicken infectious anaemia virus infection among broiler chicken flocks in Iran. *Archives of Razi Institute*.,**62(1):** 1-6.

[3] Huseyin, H., Osman Erganis, Leyla Guler and Sait Ucan, U.,2008. Investigation of Chicken Infectious Anemia Virus Infection by PCR and ELISA in Chicken Flocks**.** *Turk. J. Vet. Anim. Sci.,* **32(2):** 79-84

[4] Jianfeng, C., Jin, M., Yu, Z., Dan, H., Zhang, A., Song, Y. and Chen, H., 2007. A latex agglutination test for the rapid detection of avian influenza virus subtype H5N1 and its clinical application. *J .Vet .Diagn. Invest.,* **19:** 155- 160.

[5] Kalaiselvi, G., Parthiban,M., Narayanan, M.S., Kumar, S.S. and Kumanan, K., 2010. Rapid latex agglutination test for serodiagnosis of fowl adeno virus subtype 4 using recombinant antigen. *Veterinarski Arhiv., **80*** **(6):** 743-752.

[6] McNulty, M. S. 1991. Chicken anaemia agent: a review. *Avian Pathol*., **20**:187-203.

[7] Rosenberger, J.K. and Cloud, S.S., 1998 Chicken anemia virus. *Poult. Sci*., **77:**1190-1192.

[8] Udhayavel, S., Malmarugan**,** S., Johnson Rajeswar, J. and Sivaseelan, S., 2013. Serosurveillance of chicken infectious anaemia by c-ELISA in Tamilnadu. *Indian Veterinary Journal,* **90(8):**93-94.

Table 1. Sero- surveillance of CIAV in commercial layer by LAT

Age (weeks)	No.of samples	Positive sample	Positive (%)
6 – 10	58	19	32.75
11 – 20	22	22	100
31 – 40	14	14	100
41 – 50	44	44	100
Total	138	99	71.73

Table 2. Sero- surveillance of CIAV in layer breeder by LAT

Age (weeks)	No. of samples	Positive samples	Positive (%)
11 – 20	60	57	95
21 – 30	20	18	90
31 – 50	20	18	90
Total	100	93	93

Table 3. Sero- surveillance of CIAV in broiler breeder by LAT

Age(weeks)	No. of samples	Positive samples	Positive (%)
0 – 4	139	131	94.24
5 – 10	27	22	81.48
11 – 20	19	19	100
21 – 30	20	20	100
31 – 50	7	7	100
Total	212	199	93.86