

SEROLOGICAL SURVEY ON EGG-DROP-SYNDROME-1976 HI ANTIBODY IN CHICKENS RAISED IN BOGOR AND TANGERANG

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ABSTRACT

The serological survey was performed to investigate the presence of hemagglutination inhibition (HI) antibody against EDS-76 virus in sera from native chickens in three back yard farms and six traditional farms and from layer-and broiler-breeders in one farm. When 1 : 4 or more than 1 : 4 were considered to be positive, none of the sera from native chickens in back yard farms had positive titer. Eleven of 70 sera (15.7%) from native chickens in traditional farms, 28 of 30 sera (93.3%) of layer-breeder and 4 of 7 sera (57.1%) of broiler-breeder had positive titers, respectively.

INTRODUCTION

Since egg drop syndrome - 1976 (EDS-76) was first described by Van Eck et al. (1976), the disease has been recognized in many countries. In 1978, Mc Ferran et al. isolated EDS-76 virus firstly and then they developed hemagglutination (HI) test. At present, this HI test was used widely for detection of EDS-76 virus antibodies. More over, it was also demonstrated by Adair et al (1979) that antisera to other fowl adeno virus (FAV) do not inhibit hemagglutination, indicating that the test is specific. The survey was performed to investigate the HI antibody in native chickens from back yard and traditional farms and in breeding farms.

MATERIALS AND METHODS

The serological survey was performed at native chicken farm in Bogor and Tangerang and at breeding farm in Bogor. In this survey, 11 farms were selected and 151 chicken sera were used. Chicken sera were treated with three volume of 25 w/v % kaolin solution for 20 minutes at room temperature and then centrifuged at 2000 rpm for 10 minutes. Supernatant were collected and subjected to HI test.

Hemagglutination (HA) Test

Freeze-dried material which was obtained from culture fluid of CEL cells infected with EDS-76 virus and inactivated by addition with formalin at final concentration of 0.2 v/v % was used as antigen.

The HA test was performed with microtiter method. Two fold serial dilution of HA antigen was made in phosphat buffered saline (PBS). To each dilution, 0.025 ml of PBS was added, and 0.050 ml of 0.5 v/v % chicken erythrocytes was added and mixtured by microplate mixer. The mixture was allowed to stand at room temperature for 60 minutes. The highest dilution showing complete HA pattern was taken as HA titer. For HI test, four units of HA antigen per 0.025 ml was provided.

Hemagglutination Inhibition (HI) test

The HI test was performed as described by Adair et al. (1976) with a little modification. Two fold serial dilution of serum was made in PBS (0.025 ml). Equivalent amount of HA antigen of four units was added to each diluted serum, and the mixture was allowed to stand at room temperature for 10 minutes. To each well of mixture, 0.5 v/v % chicken erythrocytes was added. The mixture was allowed to stand at room temperature for 60 minutes. The highest serum dilution showing complete inhibition of HA pattern was taken as HI titer

RESULTS

As the result of the serological survey, all of the sera from native chickens in back yard farms showed less than 1 : 4 of HI titer. Eleven of 70 sera (15.7%) of native chickens in traditional farms showed 1 : 4 or more than 1 : 4 of HI titer ranging from 1 : 4 to 1 : 8. Twenty eight of 30 sera (93.3%) of layer-breeder showed 1 : 4 or more

than 1 : 4 of HI titer ranging from 1 : 4 to 1 : 64. Four of 7 sera (57.1%) of broiler-breeder showed 1 : 4 or more than 1 : 4 of HI titer ranging from 1 : 4 to 1 : 16.

DISCUSSION

After experimental infection with EDS-76 virus, antibody can be detected by HI test in 5 - 6 days and they reach peak in about 4 - 5 weeks (Mc Ferran, J.B. 1984). Antibody is transferred through the yolk sac, and chick have high HI titer (geometric mean titers, 1 : 256 to 512). This antibody has a half-life of 3 days. Active antibody production is not stimulated until chicks are 4 - 5 week - old and maternal antibody is nearly undetectable (Darbyshire and Peters, 1980). In native chickens from back yard farms no antibody titer was detected. As these chickens were 8-week-old, we suspected these chickens had no opportunity of infection with EDS-76 virus. Although the native

chickens in traditional farm did not vaccinate to EDS-76, 15.7% of them were positive titer. It was suggested that the chickens were naturally infected with EDS-76 virus. However, it is difficult to conclude whether this infection was due to vertical infection or horizontal infection because of no data of their parents.

An oil adjuvant inactivated vaccine is widely used, and chickens are vaccinated at 14 to 16 week-old age (Mc Ferran, J.B., 1984). Twenty eight of 30 sera (93.3%) of layer-breeder and four of 7 sera (57.1%) of broiler-breeder had positive titer. As these chickens were 43-week-old, we suspected these chickens had already vaccinated to EDS-76. In order to clarify this situation, it is necessary to carry out further survey.

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Table 1. Distribution of HI titer against EDS-76

Farm	Chickens	No. of Farm	No. of sera	Distribution of HI titer						No. of positive sera (%)
				< 4	4	8	16	32	64	
Back yard	Native	3	44	44	—	—	—	—	—	0 (0.0)
Traditional	Native	6	70	59	8	3	—	—	—	11 (15.7)
Breeding	Layer	1	30	2	1	7	13	5	2	28 (93.3)
Breeding	Broiler	1	7	3	2	—	2	—	—	4 (57.1)
Total		11	151	108	11	10	15	5	2	43 (28.4)

REFERENCES

- Adair, B.M., J.B. Mc Ferran, T.J. Connor, M.S. Mc Nulty, and R.R. Mc Killop. 1979. Biological and physical properties of a virus (strain 127) associated with the egg drop syndrome 1976. *Avian Pathol.* 8 : 249-264.
- Darbyshire, J.H. and R.W. Peters. 1980. Studies on EDS-76 virus infection in laying chickens. *Avian Pathol.* 9 : 277-290.
- Mc Ferran, J.B., Mc Cracken, R.M., Mc Killop, E.R., Mc Nulty, M.S. and Collins, D.S. 1978. Studies on a depressed egg production syndrome in northern Ireland. *Avian Pathol.* 7 : 35-47.
- Mc Ferran, J.B. 1984. Egg Drop Syndrome 1976. In : *Disease of Poultry*. 8th Edition, pp. 516-523. Edited by Hofstad, M.S., Barner, H.J., Calnek, B.W., Reid, W.M. and Yoder H.W. Ames; Iowa State University Press.
- Van Eck, J.H.H., Davelaar, F.G., van den heuvel-Plesman, T.A.M., van Kol, N., Koutenhoven, B. and Guldie, F.H.M. 1976. Dropped egg production, soft shelled and shell-less eggs associated with appearance of precipitins to adeno virus in flocks of laying fowls. *Avian Pathol.* 5 : 261-272.