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Serological Survey of Chicken Infectious Anemia in Commercial Chicken Flocks in Khartoum State Sudan

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Abstract: A serological survey of chicken infectious anemia was carried in a commercial chicken flocks in Khartoum state. A total of 572 serum samples from 19 unvaccinated flocks (11 layer, 6 broiler and 2 breeder) were analyzed for Chicken Anemia Virus (CAV) antibodies with an Enzyme Linked Immunosorbent Assay (ELISA). CAV antibodies were detected in 62.0% of the samples.The prevalence of CAV antibodies in layer and broiler flocks was 67.3 and 44.3%, respectively, with ELISA titer ranging from 2880 to 8661. All samples from breeder flocks were positive to CAV antibodies and ELISA titer = 8661 were detected in 70% of the Samples. This is the first report of CAV infection in chicken flocks in Sudan.

Key words: Chicken, infectious, anemia, serology, ELISA

INTRODUCTION

Chicken Anemia Virus (CAV) was first isolated and described by Yuasa and colleagues[1]. The virus is a non-enveloped with a circular single- stranded DNA genome belonging to the family circoviridae Murphy[2]. The virus spread congenitally from dams to progeny and horizontally by contact exposure to infected chickens or fomites. Clinical disease takes place when chicks are infected during the first two weeks of life, but can be avoided if the breeder hens transfer enough antibodies to their progeny Claudio *et al.*[3]. After two weeks of age, although chicks can be infected with virus they do not develop clinical symptoms of the disease. Breeder hens infected during the laying period do not demon-demonstrate clinical signs or changes in the number of eggs produced, fertility or embryo viability[4]. In young chickens, the clinical disease is characterized by anemia, generalized atrophy of the hematopietic and lymphoid organs and concomitant immune- depression Todd[5]. This work deals with a serological survey of chicken infectious anemia in commercial chicken flocks in Khartoum state-Sudan.

MATERIALS AND METHODS

Serum samples: 572 serum samples were collected from 19 non-vaccinated chicken flocks (11 layers, 6 broiler and 2 breeder) from different localities at Khartoum state. Birds were of different breeds (Bovans, Lohmann, Hybro and 2 layer flocks were from local baladi breed). Their ages were from 3 to 7 weeks for broiler and 23 to 47 weeks for layer and breeder. All flocks were raised on open system of management except two flocks that were kept on closed system. The collected sera were kept at-20 until tested.

Enzyme-Linked Immunosorbent Assay (ELISA): Sera were tested using the chicken anemia virus antibody ELISA kit (Flock Chek - IDEXX, Holland).The test was carried out as described by the manufacturer. The presence or absence of antibody to CAV is determined by the Sample to Negative (S/N) ratios for each sample. Samples with S/N value of less than 0.6 are considered positive Samples with S/N values of equal to or greater than 0.6 are considered negative. The presence of CAV antibodies indicates previous exposure to chicken anemia virus.

RESULTS AND DISCUSSIONS

CAV antibodies were detected in 355 (62.0%) out of the 572 samples collected from 19 unvaccinated chicken flocks. Antibodies were detected in all the flocks tested with prevalence rates of 67.3 and 44.3% for layer and broiler flocks respectively to 100% in breeder flocks. Titers detected ranged from 2880 to 8661.In addition, all samples collected from breeder flocks were found positive to have high CAV antibodies titer (8661) in 70% of the hens tested.

In the present study, 335(62%) out of 572 sample tested in Khartoum state were found positive to CAV antibodies using a commercial ELISA kit. The prevalence of anti CAV antibodies was highest (100%) in breeder (age 24-35 weeks) followed by 67.3% in layer

(age 23-47 weeks) flocks, compa-red to 44.3% for broiler flocks (age 3-7 weeks). The results indicated incre-ase in the prevalence of antibody with increasing age of the birds. This result is in agreement with that of Brentano *et al.*[6] and Herdt *et al.*[7]. But, differs from that obtained by Claudio *et al.*[3] who found no significant differences of prevalence of infection between different breeding periods indicating infection at an earlier age. The same authors also indicated that some birds in their third breeding periods became seronegative due to lack of antigenic stimulation[8]. In our work, all of the non-vaccinated breeder flocks examined were found to be infected with 100% of the hens tested presenting CAV antibodies indicating continuous field challenge. In addition 70% of these hens had ELISA titers 8661 which are considered high enough to protect their progeny against infection. Claudio *et al.*[3] established that in breeder hens, ELISA titers higher than 5000 could completely protect progeny against clinical disease during the critical period of life. Moreover, the occurrence of serum negative breeder hens at all periods of their life is a cause of concern because they are susceptible to infection and can vertically transmit CAV virus to their progeny[3] resulting in disease. The high titers of CAV antibodies reported here in may explain absence of clinical disease in Sudan or other wise, the disease may have gone undiagnosed because of its novelity in this country.

CONCLUSIONS

The present communication showed widespread sero-conversion indicating presence of CAV infection in Sudan. This is represent the first report of CAV infections in the Sudan.

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