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Serosurveillance Study on Avian Infectious Bronchitis Virus in Sudan

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Abstract: Serum samples were collected from commercial layer and broiler flocks 3 to 63 weeks old at four areas from Sudan. All flocks were not previously vaccinated against infectious bronchitis (IB) virus. Sera were tested using haemagglutination inhibition (HI) test for IB virus antibodies. 689(71%) out of the 957 samples examined had an HI titer ranging from 6 to 11 (log_2). High incidence (90%) of IB virus infection was detected among layer flocks at Khartoum State and 46.8% of the samples had an HI titer > 10(log_2). Low HI titer (<4 log_2) was detected among samples collected from layer flocks at Sennar (Central Sudan). The results obtained indicated widespread and distribution of IB virus infection in Sudan.

Key word : Avian, infectious, bronchitis, serosurveillance

INTRODUCTION

Infectious bronchitis (IB) was first recorded in the USA in 1930 as a new respiratory disease of baby chicks[1]. IB can be devasting disease to any poultry operation. It affects chickens of all ages, types and breeds. The disease is caused by a corona virus which is known to have a high mutation rate. Thus, many serotypes (and subtypes) exist throughout the world [2]. IB is a highly contagious respiratory disease that causes significant economic losses in broiler and layer chickens. The acute respiratory disease is commonly followed by secondary bacterial infections particularly in broilers. Layers and breeders are highly susceptible to variant IB virus and egg production problems due to the infections are common particularly on farms with multiple-age flocks[3,4].

In Sudan, IB was isolated for the first time in Eastern Sudan, from an outbreak of a respiratory disease in chickens that occurred during the cold dry winter in February 1981[5]. The present work deals with a serosurveillance on infectious bronchitis virus in chicken flocks in Sudan.

A total of 957 serum samples were collected from chickens at different localities of Sudan Khartoum and Gazira (Central Sudan) Nyala (Western Sudan) and Atbara (Northern Sudan). All birds were apparently healthy but a mild respiratory signs and depressed egg production were recorded in some layer flocks at Khartoum and Gazira. Birds were of different breeds (Bovans, Hisex, Hybro lohmann and local). They were raised on an open system of management for meat and eggs production. There was no history of IB vaccinations among all flocks examined.

The collected sera were clarified by centrifugation and kept at –20°C until tested for an IB antibody by means of Haemagglutination inhibition (HI) test.

Antigens and antiserum: Reference IB virus antigens and antiserum of Massachusetts strain (M_{41} (HA and HI) obtained from Intervet-Holland, were used.

HI test: For this test, the method described by Alexander *et al.,*[6] was applied in detection of IB antibodies. In brief, a volume of 0.025ml serum, 0.025ml of 4HA units of IB virus antigen and 0.025ml of 1% chicken RBCs were used. Titers were expressed as the reciprocal of the highest dilution of serum causing inhibition to 4 HA units of virus. A titer of > 6 log_2 was considered as positive.

The results of the serosurveillance of IB antibodies are shown in Table 1. 689(71%) of the samples examined had an HI titer ranging from 6 to 11 (log_2). Among layer flocks at Khartoum State 103(46.8%) of the samples had an HI titer >10(log_2). Regarding the local breed (Baladi), high level of IB antibodies were detected among samples collected from Nyala city and about 90(44.7%) of the samples had an HI level ranging from 6 to 11(log_2). Of all samples examined only 15 samples collected from layer flock at Sennar (Gazira) showed low level of IB antibodies (HI titer <4 Log_2).

In the present work the standard technique for HI test developed by Alexander *et al*[1] was used for monitoring the IB virus antibodies. The HI test is used in this work because; it is sensitive, cheap, reproducible and easy to apply. Comparative studies[7]showed that IB virus antibody was detected earlier by HI test than virus neutralization (VN) test. Thus, establishing the value of HI test for diagnosing IB virus and monitoring the vaccines status of flocks [8,9].

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Table 1:The prevalence of IB virus antibodies in different localities in Sudan as measured by HI test

					HI titer (log2) Titer in between		
Location	No. of sample	Type	breed	Age (weeks)	<4	4-5	6-11
Khartoum	330	Broiler	Foreign	3-5	0	78	252
Khartoum	220	Layer	Foreign	35-63	0	22	198
Gazira	100	Broiler and Layer	Foreign	3-56	15	18	67
Nyala	207	Layer	Local (Baladi)	12-26	0	117	90
Atbara	100	Layer	Local (Baladi)	10-56	0	18	82

The results of the present study indicated widespread distribution of IB infection in chicken flocks in the Sudan. High prevalence of the infection was detected among unvaccinated layer flocks at Khartoum State. Several strains of IB virus were isolated from these flocks (unpublished data) with respiratory symptoms. Chickens of local breed (Baladi) were also susceptible to IB infections as indicated by high prevalence of IB virus antibodies in these apparently healthy birds and high HI titers being recorded in serum sample collected from some chickens at Nyala and Atbara. The results obtained in this study confirmed the previous results[10] which indicated the widespread nature of the disease in chickens from Khartoum, North Kordofan (Western Sudan) Kassala (Eastern Sudan) and Atbara (Northern Sudan) cities.

Finally, the higher prevalence of IB virus antibodies in commercial chickens in the Sudan underscores the importance of isolation and identification of IB virus serotype(s) circulating in the field to allow use of appropriate vaccine strains to control the disease in this country.

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