DOI : 10.5958/2277-8934.2017.00049.2 *Vol 24 No 3, p 291-293*

SEROPREVALENCE OF BLUETONGUE IN DROMEDARIES

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ABSTRACT

Bluetongue (BT) is an infectious, non-contagious, arthropod-borne viral disease, mainly of sheep but many domestic and wild animals are also affected by this disease. A serological study was aimed at the detection of BTV antibodies by Agar Gel Immunodiffusion test (BT-AGID) and competitive Enzyme Linked Immunosorbent Assay (c-ELISA) in dromedaries of North Gujarat and Kachchh regions. Out of 533 serum samples, the BT-AGID test detected antibodies against BTV in 83 cases (15.57%) while c-ELISA test was positive in 136 cases (25.51%).

Key words: Bluetongue, BT-AGID, camels, c-ELISA, seroprevalence

Bluetongue (BT) is an infectious and non-contagious arthropod borne viral disease of domestic and wild ruminants mainly sheep, goat, cattle, camels, deer and antelopes (Molalegne *et al*, 2013). It is transmitted by arthropods of the genus *Culicoides* and mostly prevalent in tropical, semitropical and temperate regions of the world (Tabachnick, 2004). It is a notifiable disease and is listed with those diseases that can spread rapidly and that have a considerable impact on the health of livestock (Mozaffari *et al,* 2013). The economic losses due to BT is around 3 billion US$ per year in the world (Sperlova and Zendulkova, 2011). Direct losses are caused by death, abortions, weight loss, reduced milk and meat productions. Indirect losses are through export restrictions of live animals, semen and foetal calf serum (Bitew *et al*, 2013). The diagnosis of a BT infection relies primarily on assays detecting antibodies to a group-specific antigen. Agar Gel Immunodiffusion (AGID) test is the most widely used assay for this purpose (Khimaniya *et al,* 2013). Although, the AGID test is simple and rapid to perform, however, it gives cross-reactions with other orbiviruses, e.g. epizootic haemorrhagic disease virus. To overcome this problem, monoclonal antibody based competitive ELISA (c-ELISA) is a highly specific as well as sensitive test for detection of BTV antibodies (OIE, 2016).

Materials and Methods

Test samples

A total of 533 sera were collected from dromedaries of North Gujarat (363) and Kachchh (170) regions of Gujarat state including 2 different breed Kachchhi (436) and Marwari (97). Agewise sera were collected from three different group of age 3 to 5 years old (55), 5 to 7 years old (153) and more then 7 years old (325) dromedaries. Approximately 10 ml of blood were collected from individual animals aseptically from the jugular vein using plain BD Vacutainer. The vacutainer tubes were kept in slanting position at room temperature for 2 hours and centrifuged at 3000 rpm for 10 minutes. The separated serum was collected in screw capped plastic vial and heat inactivated at 56°C for 30 minutes. The sera were held at –20°C temperature until tested.

All 533 dromedary sera were tested with commercially available AGID and cELISA. The test methods used followed strictly the kit manufacturer's description and the protocol of Pearson and Jochim (1979) and Afshar *et al* (1987).

The performance of c-ELISA and BT-AGID tests for the detection of BTV group specific antibodies in camel sera was compared with each other on 533 dromedary sera. Considering c-ELISA as reference test, cross tabulation of c-ELISA and BT-AGID was recorded as per the method described by Martin (1977) to determine relative sensitivity and specificity of BT versus AGID by the following formula:

$$\text{Sensitivity (\%)} = \frac{\text{(c-ELISA and BT-AGID positives)}}{\text{c-ELISA positives}} \times 100$$

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$$\text{Specificity (\%)} = \frac{\text{c-ELISA and BT-AGID negatives}}{\text{c-ELISA negatives}} \times 100$$

Results and Discussion

Seroepidemiological studies are important tool for the epidemiology of BT (Mehrotra and Shukla, 1990) and serological surveys are used to analyse the infection status of ruminants in an area (Sreenivasulu and Subba Rao, 1999). Eighty three sera (15.57%) were positive by BT-AGID, while 136 (25.51%) were positive by c-ELISA. Khimaniya *et al* (2013) reported BTV antibodies of 14.30% and 24.35% by AGID and cELISA tests, respectively. Mohamed *et al* (2012) reported a 25.70% seroprevelance of BT in camels in Iran by cELISA. In contrast to our findings, a lower rate of BTV antibodies were reported by Chandel and Kher (1999) in Gujarat and Mallik *et al* (2002) in Rajasthan by AGID test, while Chauhan *et al* (2004) reported higher rates of seroprevalence in camels by AGID and c-ELISA tests. An overview of BT seroprevalence in camelids were also given by Wernery *et al* (2014).

In North Gujarat, overall seroprevalence found was 16.25% and 27.27% by AGID and cELISA, respectively while in Kachchh region, the seroprevalence found was 14.11% by AGID and 21.76% by cELISA.

Comparing the seroprevalence of the 2 different dromedary breeds tested, the results showed that Marwari breed showed a higher prevalence over Kachchi breed (19.6% and 32% to 14.7% and 24.1%).

Sera were collected from different age group of camels. The highest seroprevalence was reported in the old age group while in case of the young age group, it was lowest both, by AGID and c-ELISA.

$$\text{Overall agreement (\%)} = \frac{\text{c-ELISA and BT-AGID positives + c-ELISA and BT-AGID negatives}}{\text{c-ELISA positives + c-ELISA negatives}} \times 100$$

Out of 533 sera tested, 136 sera were found positive and 397 sera were found negative by both the tests, while 53 samples detected positive by c-ELISA were negative in BT-AGID test. Relative to c-ELISA results, the sensitivity of BT-AGID was 61.02% and specificity was 100.00%. Overall agreement between both the tests was 90.05%.

Acknowledgement

The Bluetongue virus (BTV) antibody test kits AGID and c-ELISA were made available by Dr. M. M. Jochim, Veterinary Diagnostic Technology Incorporation, U S A.

Thanks are extended to the Project Coordintor for All India Network Project on Bluetongue and to the Dean, College of Veterinary Science and A.H., SDAU, Sardarkrushinagar for providing the necessary facilities where this study was conducted. We also gratefully acknowledge the help of field veterinarians for collecting the blood samples.

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Special session on camels in 11th International Veterinary Congress at Berlin, Germany

Special session on camels with a theme "Camel Research: Challenges and Opportunities" will take place in 11th International Veterinary Congress at Berlin, Germany scheduled on 2-3 July 2018.

There will be limited participants in this special session and their deliberations will be of great value to the participants. Desirous participants are requested to submit their abstracts at an earliest.

Dr. T.K. Gahlot is the Organising Secretary for the special session and he can be contacted on email tkcamelvet@yahoo.com

Note: Please find Registration fees of this conference at https://veterinary.conferenceseries.com//registration.php

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Camel Conference held at Inner Mongolia, China

The international conference "The Belt and Road: Camel Science, Industry and Culture" was held on 22-26th September 2017 at Alxa League, Inner Mongolia, China.

The main topics discussed were Camel Genetics and Genomics, Camel Products: camel milk, meat, hair, camel blood, leather & bones, Camel Reproduction and Management, Camel Nutrition and Metabolism, Camel Health and Diseases and Camel Culture and Tourism. It was attended by more than 200 delegates from China and other countries. The conference included important visits to various places of camels and camel products. The opening ceremony of Bactrian camel festival was also witnessed by the delegates. The cooperative camel breeder society, machine milking of she camels, market of camel products and good cultural programmes were seen by the delegates in and around inner Mongolia.

Glimpses of International Camel Conference, Inner Mongolia, China

Delegates of International Camel Conference, Inner Mongolia

Delegates tasting Bactrian camel milk products