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Scientific Report

Serologic evidence of bluetongue infection in one-humped camels (*Camelus dromedarius*) in Kerman province, Iran

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Summary

Herein, we presented the first report on bluetongue (BT) disease in 10 pregnant camels in a herd from Kerman province, Iran. All sera samples were tested serologically (AGID, C-ELISA). We also used the Razi-BK cell line, performed primary culture of ovine kidney and inoculated intravenously the embryonated chicken eggs (ECE) to culture and isolate the BT virus. Efforts to culture and isolation of BT virus have met with very limited success. Following precipitation test (AGID) and C-ELISA, 5 of 10 sera in AGID test, and all in C-ELISA became positive. Further studies are needed on the ecology of camels and vector midges to clarify the reason for infection of the camels in Iran.

Key words: Bluetongue, Serology, ELISA, Camels

Introduction

Bluetongue (BT) is an infectious non-contagious insect-born viral disease of ruminants of variable clinical severity (Akhtar *et al.*, 1996). All ruminants including sheep, goats, cattle, buffaloes, antelopes, deer and camels are susceptible to develop BT (Akhtar *et al.*, 1996). The disease has been described in camels in several countries of the Middle East, but not Iran. In spite of an almost high prevalence of BT antibodies and antigens among sheep, goats and cattle in many provinces of Iran in the past, no virus isolations have been made until recently (Afshar and Keyvanfar, 1995; Mahdavi and Bahonar, 2003). Moreover, to the best of our knowledge, no report has been published on BT disease of camels in Iran.

Herein, we presented the first report of BT as diagnosed by serology in 10 pregnant camels in a herd. Samples of serum were taken from Kerman province of Iran. All samples were tested by serologic examination (AGID, C-ELISA). Moreover, Razi-BK cell line, primary culture of ovine kidney and intravenous inoculation of embryonated chicken eggs (ECE) were used in this study to culture and isolate the BT virus.

Materials and Methods

Animals

In Iran, camels are used for transport, draught power, meat and milk and constitute one of the most important livestock species in eastern and southern provinces.

From 25 November (2004) to 1 December (2004), ten pregnant dromedary camels from Kerman were presented with transient fever, edema of the muzzle, and hyperemia of the eye and oral mucosa. The oral lesions progressed to petechial haemorrhages. Camels were examined carefully.

Virus isolation

Blood samples were collected aseptically and transported under cold chain conditions to the Department of Virology, Razi Institute. Blood samples in EDTA were cultured on Razi-BK cell line, primary ovine

kidney cell and ECE. After inoculating of samples and incubation for 24, 34, 44, 54, 60 hrs at 37°C, they were examined microscopically for evidence of cytopathic effects (CPE) (Clavijo *et al.*, 2000).

Serological tests

Sera were assayed using agar gel immuno-diffusion test (AGID). The antigen used was of type 1 and the antiserum used was of type 1 NE 36-40. The test was performed as described by the protocol of Institute for Animal Health. Moreover, sera were tested with competitive enzyme-linked immunosorbent assay (C-ELISA) (Bluetongue Antibody Test Kit, VMRD, Inc., USA), that has been validated both for domestic and wild animals (Afshar and Keyvanfar, 1995).

Results

Efforts to culture and isolate the BT virus have met with very limited success. Following precipitation test (AGID) and C-ELISA, five of ten sera in AGID test, and all in C-ELISA became positive.

Discussion

The usual range for BT disease is between latitude of 35 °S and 40 °N (Stanley, 1990; Prasad *et al*., 1992; Gorchs and Lager, 2001). Kerman province lies within the above-mentioned range. Iran is immediately adjacent to a BT zone where the situation is unstable (Iraq, Turkey, Afghanistan, Pakistan) (Taylor and Mellor, 1994; Mellor and Wittmann, 2002). Because, vacci-nation programs for BT is not carried out in Iran, a positive test result indicates BT infection in the domestic populations. Kerman agricultural economy is based on pastoralist on its extensive semi-arid rangelands; therefore, sheep, goats, cattle and camels come into contact when grazing (Akhtar *et al*., 1995; Akhtar *et al*., 1996; Gorchs and Lager, 2001). Considering the seasonal movement of different live animals across Kerman province, it is suggested that a risk-based approach be adopted. Vector distribution, abundance, infection rates in sheep and goats, efficiency and host preferences may all be important in infection of the camels (Akhtar *et al*., 1995; Akhtar *et al*., 1996; Joshi *et al*., 1996; Koumbati *et al*., 1999; Kirkland *et al*., 2002). Considering the pregnancy of camels, the occurrence of virus in semen is one of the probable causes for developing BT in camels.

Consequently, appropriate strategies should be established to allow the safe movements of animals (including those that are seropositive either as a result of natural infection or vaccination) and semen from male camels in zones where BT virus infection may occur.

There is scarce information on the natural reservoir of the disease or even whether such a reservoir exists in Kerman province. Although camels and livestock use the same water sources and grazing areas while vectors are active, they may not interact where the vector population are high. Recorded vectors are not known to be present for camels as well as sheep, so a novel vector is likely to be operating (Sreenivgsulu and Rao, 1999; Mellor and Wittmann, 2002). Further studies are therefore needed on the ecology of camels and vector midges to clarify the reason for infection of camels in Iran. Furthermore, research on isolation and identification of BT virus in camels is open to question.

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