Observations on African horse sickness in Saudi Arabia

A.I. Al-Afaleq (1), E.M.E. Abu Elzein (1) & M.M. Hassanein (2)

(1) College of Veterinary Medicine, P.O. Box 1757, King Faisal University, Al-Ahsa 31982, Saudi Arabia
(2) Serum and Vaccine Institute, P.O. Box 131, Cairo, Egypt

Summary
The present epidemiological status of African horse sickness in Saudi Arabia, as shown by seroconversion, virus isolation and clinical observation of sentinel horses is described. No African horse sickness virus activity was detected throughout the duration of the study (from November 1992 to March 1995). These findings support previous reports that African horse sickness is not endemic in Saudi Arabia.

Keywords

Introduction
African horse sickness (AHS) is an acute or subacute, febrile, seasonal, infectious, non-contagious disease of solipeds caused by an orbivirus of the family Reoviridae. Nine serotypes have been identified to date.

Only Equidae are naturally infected by the virus. The horse is not only the most susceptible animal but also suffers the highest mortality (9). The Middle Eastern donkey has been found less susceptible than mules but more susceptible than the African donkey, which was reported to be quite resistant (1, 2). African horse sickness was reported many centuries ago in South Africa, and was recorded in an Arabic document between 1327 and 1328 (11). However, the disease only appeared in the recent literature at the beginning of the 20th Century (6, 8). The disease was then reported in other parts of Africa and southern Europe, among other places.

In the Middle East, by the early 1960s, a pandemic of AHS had swept through Turkey, Iran, Iraq, Syria, Lebanon and Jordan, causing the death of an estimated 300,000 Equidae (9, 14). An outbreak in India during the same period was fatal for 90% of the Equidae involved (16).

In the south-western part of the country. On this occasion, type 9 virus was identified by the Pirbright Laboratory, United Kingdom (UK).

Since the occurrence of the 1989 AHS outbreak in Saudi Arabia, the authorities have ensured constant surveillance of any further outbreaks of the disease.

In this connection, the authors have conducted the present study to obtain information on the status of AHS in Saudi Arabia, with particular emphasis on the Abha district, which constitutes the first barrier against the south-westerly winds from Africa which are believed to transport the infected midges to Saudi Arabia.

Materials and methods
Establishing a sentinel horse herd
A horse herd was identified in Khamis Mushait, in the Abha district of the Aseer region, composed of just over one hundred horses of different age groups. Twelve horses which had given negative results to serological tests were chosen as sentinel animals. From each of these, whole blood was collected monthly, in ethylenediamine tetra-acetic acid (EDTA), for virus isolation and serum separation, in order to monitor seroconversion for a one-year period (November 1992 to October 1993).
All the sentinel horses and their herd mates were placed under close clinical observation for signs of AHS infection between 1992 and 1995.

**Links with other horse-keeping farms in Saudi Arabia**

Contact was made with veterinary authorities in the various parts of the country where horses are kept for racing or other purposes, to keep track of any clinical signs of AHS infection in these herds.

**Attempts to isolate the virus from sentinel horses**

Whole blood in EDTA was processed for virus isolation as described by Mellor et al. (10). Chicken egg embryos were inoculated via the yolk sac; two- to three-day-old mice were inoculated intracerebrally, and baby hamster kidney 21 (BHK-21) cells and Vero cells were also inoculated (10). The results of the tests were read as described by Mellor et al. (10).

**Testing the sera collected monthly from the sentinel horses for antibodies**

Agar gel immunodiffusion (AGID) tests were conducted on standard microscope glass slides coated with 1.2% Noble agar, in borate buffer pH 8.6, as described by Abu Elzein et al. (1). Six-well rosettes around a central well were cut on the agar. Soluble AHS antigen, kindly provided by the Pirbright Laboratory, was placed in the central well. Positive reference antiserum and the test sera were added to alternate wells of the rosette. Non-infected BHK-21 cell cultures were used as negative antigen controls. The slides were placed in a humid chamber and left at room temperature (22°C-25°C), and results were read the next day. A final reading was taken 72 hours later.

**Seroconversion**

There was no seroconversion in any of the sentinel horses at any stage during the twelve months of surveillance.

**Virus isolation**

No AHS virus was recovered from any of the sentinel horses.

**Discussion**

Clinical observations of the sentinel herd of horses in Abha revealed no signs of AHS virus infection from November 1992 to March 1995. Furthermore, the Annual Reports of the Ministry of Agriculture and Water of Saudi Arabia indicated that there was no AHS infection in the country during this period.

The attempts to isolate the virus and the seroconversion study conducted on the sentinel herd in Abha were refractory, indicating an absence of AHS virus activity.

Although reports in 1989 and 1990 (3, 10) indicated the presence of AHS virus infection in horses in Abha, it seems likely that the virus was not endemic in that region and that infection was due to infected midges being wind-driven under favourable weather conditions from the horn of Africa. Similar situations have been described elsewhere (15).

The present study supports the belief that AHS has never been endemic in Saudi Arabia. This can be seen from the sporadic nature of the disease over the years. For example, the first recorded outbreak occurred almost thirty years ago (13), and the second in 1989 (3, 10), which was confined to the Abha district.

It is thought that several epidemiological factors may play a role in the AHS situation in Saudi Arabia. A salient point is that since there is no influx of horses or other Equidae to Saudi Arabia from AHS-endemic countries, the most probable source of infection is infected midges being blown into the country from surrounding countries in which AHS occurs. However, attention should be drawn to the importance of controlling the importation of zebra from AHS-endemic regions. Such animals must be well screened for AHS virus and antibodies before being introduced into the country (4, 7).

Since the number of horses in Saudi Arabia is small, and since all animals are kept in good conditions, and are properly managed, on farms and in stables, the authors suggest that stablets must be protected by insect-proof wire mesh and that horses must be kept stabled during dusk and dawn to avoid being bitten by midges. Furthermore, regular application of fly-repellents and insecticides around the stables reduces the number of Culicoides spp. to a minimum (12; M.A. Hilali and colleagues, unpublished findings).
Several Culicoides spp. have been caught in various places in Saudi Arabia. Information on the seasonality and abundance of this species, together with the results of arbovirus isolation attempts will be published shortly (M.A. Hilali and colleagues, unpublished findings). However, no AHS virus has been isolated from this species.

Historically, and until the present time, AHS has never been endemic in Saudi Arabia. Only two sporadic cases could be traced to 1959 (13) and 1989 (3, 10). In view of this situation, the authors would like to claim that AHS is not endemic in Saudi Arabia.

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Résumé

Mots-clés

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Resumen
Los autores describen la situación actual de la peste equina en Arabia Saudí, a partir de ensayos de titulación de anticuerpos, aislamiento del virus y observaciones clínicas en caballos centinelas. El virus de la peste equina no mostró ninguna actividad durante el período de estudio (desde noviembre de 1992 hasta marzo de 1995). Estos datos confirman, haciéndose eco de pasados informes, que la peste equina no es endémica en Arabia Saudí.

Palabras clave
References


