WEST NILE FEVER IN THE UNITED ARAB EMIRATES

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Introduction

The West Nile virus (WNV) was first isolated in the West Nile district of Uganda in 1937 from the blood of a woman suffering from a mild febrile illness. Since then, outbreaks have been reported from all over the world. In 1999 the disease West Nile Fever (WNF) reached the United States, and has spread over the entire USA since then. West Nile Fever (WNF) has also reached the United Arab Emirates (UAE). We report here for the first time the results of a serological survey of WNV in the UAE.

Materials and Methods

Three different antibody tests have been used for the detection of antibodies in equine samples collected from different Emirates of the UAE. These included the WNV-specific IgM and the IgG capture ELISA tests as well as the serum neutralization test (SNT). The first and last tests were carried out on eleven equine samples at the Cornell Veterinary faculty, USA, whereas the IgG capture ELISA test was performed on 750 equine samples at CVRL, Dubai. The IDScreen® West Nile indirect test (IDVet, France, e-mail: idvet.info@id-vet.com).is a competitive ELISA which detects antibodies directed against PrME envelope WNV protein. This test can be used for different animal species.

Results and Discussion

In total 750 equine sera, originating from 6 Emirates (all except Umm Al Quwain) including Al Ain, were tested with the IgG capture ELISA. In total 144 horses (19.2%) had antibodies to WNV. This distribution is shown in Figure 1.

IgM antibodies appear early in the course of an infection and usually do not reappear after further exposure. Therefore a positive IgM response generally indicates a recent infection and the test has been used as a primary assay to identify equine WNV approximately 2-6 weeks after exposure. IgG antibodies are associated with the memory aspect of the immune response and appear after repeated exposure to the infection. They persist in the circulation for a long time, so a positive IgG test generally indicates an infection in the past.

SNT measures the amount of neutralizing antibodies to a particular micro organism in the serum, indicating an exposure to the micro organism. A positive IgM ELISA in combination with a positive SNT result is indicative of a recent infection. A positive SNT result with a negative IgM result would mean exposure to the virus, only.

The reason for this investigation was a horse from Ghantoot (Abu Dhabi) which demonstrated clinical signs consistent with WN encephalitis. This horse had IgM and SNT antibodies to WNV. The horse recovered. From Ghantoot area 69 sera were then tested of which 58 (84%) showed antibodies to WNV. However, when 11 of these horses were tested with the IgM and SNT in Cornell, only the SNT showed positive results indicating that the horses had been exposed to the virus sometime over 6 weeks prior to the sampling. Also blood samples from 3 feral pigeons from Ghantoot tested positive with the IgG capture ELISA. Efforts are currently being made to isolate the virus from mosquitoes and birds.

For the diagnosis of WNV, the following samples from any animal species should be submitted to CVRL (Steele et al., 2000):

for virus isolation: pieces of kidney, frozen or fresh
for PCR: pieces of kidney, frozen or fresh
antibody test: 0.5ml of frozen serum (IgM and/or IgG)
antigen test: frozen mosquitoes

Virus isolation is essential to elucidate if lineage 1 or 2 of WNV circulates in the UAE. Lineage 2 comprises viruses that have only been found to circulate in enzootic cycles in birds in Africa with hardly any disease (Castillo-Olivares and Wood, 2004). Since only one horse with CNS signs has been reported so far, we believe that a very mild strain of WNF circulates in the UAE.

Migrating birds carrying WNV in their blood have a significant impact on the spread of WNV. More or less any bird species can carry the virus but some, like corvids (crow, raven) and robins are very susceptible. WNV surveillance should focus on these species, but should also include any other avian species. It is not known which avian species plays an important role in the UAE. In Ghantoot 3 feral pigeons were positive for WNV antibodies.

Horses and humans are dead-end hosts and can therefore not transmit the virus. Their blood viral load is too low to infect biting mosquitoes. WNV can only be transmitted by mosquitoes, and they become infected when they take a blood meal from a bird carrying WNV.

Summary

West Nile Virus (WNV) has entered the UAE. A serological survey on 750 equines from the UAE showed a prevalence of 20%. The Minis-

try of Environment and Water has allowed the vaccination of horses against WNV.

References

Steele, K.E., M.J. Linne, R.J. Schloepp et al. 2000. Pathology of fatal West Nile virus infections in native and exotic birds during 1999 outbreak in New York City, New York. *Vet. Pathol. 3:* 208-224.

Castillo-Olivares, J. and J. Wood 2004. West Nile virus infection of horses. *Vet. Res. 35:* 467-483

Figure 1. *Serological prevalence of WNV antibodies in horses tested in the UAE.*