FOCUS ARTICLE: West Nile Virus in horses (Dr Javier Castillo-Olivares, Centre for Preventive Medicine, Animal Health Trust)

In the last decade, WNV has re-emerged as an important pathogen of humans and horses, with more frequent outbreaks with increased proportion of neurological disease cases being reported. Outbreaks in Romania and Morocco in 1996, Tunisia in 1997, Italy in 1998, Russia, United States and Israel in 1999, and France, United States and Israel in 2000 presented either an increase in the number of severe human cases, an increase in the severity of neurological disease in horses or high bird mortality. In some instances all three features were present, as was the case in the US outbreaks. In Europe, WNV activity was again reported in September 2004 from the Camargue region of France where 37 suspected equine WNV infections were identified, of which 14 were laboratory confirmed. Furthermore, in the summer of 2005, in the Volgograd and Astrakhan regions of Russia, 151 people fell ill with WNV infection with 35 deaths.

West Nile Virus in horses is a notifiable disease and this, as with other notifiable diseases, is a key component of disease surveillance. As yet no cases have been diagnosed in the UK.

To date there are no reports of UK horses becoming infected with WNV during travel to affected areas, however the risk of this is apparent from confirmation that two Irish people diagnosed with WNV infection had contracted the disease while on holiday in the Algarve, Portugal. It is believed that migratory birds, originating from Africa and other areas where WNV is endemic, provide a potential source of WNV infection in the UK. Furthermore, serological investigations in birds suggest that WNV or a WN-like virus has been circulating amongst UK non-migratory bird populations. The Animal Health Trust has developed basic diagnostic capabilities for equine WNV but further work is necessary. Currently, there are no seroprevalence data to indicate whether WNV has been circulating within the UK horse population. However, it would be important to establish the WNV transmission baseline to analyse the spread of WNV by serological means should an outbreak of WNV neurological disease occur in Britain.

Serological testing is a key component of surveillance strategies for WNV and essential to conduct epidemiological studies to determine the prevalence of the infection within a population. Detection of WNV specific antibodies in serum for laboratory diagnosis and epidemiological studies...
of WNV infection in horses is made by virus neutralisation and WNV-specific IgM and IgG ELISA tests. The interpretation of serological data is not always straightforward due to cross-reactivity of antibodies and/or use of WNV vaccines.

The rapid spread of WNV across North America and its impact on equine health (over 17000 clinically affected horses) triggered the development of equine WNV vaccines. Two vaccines are currently available commercially against WNV in the US. A whole virus inactivated vaccine appeared in 2003 and has been used widely since. More recently, a recombinant pox-virus vectored WNV vaccine has also been released. All vaccines have been shown to induce virus neutralising antibodies, as occurs during natural WNV infection. Therefore, serum samples obtained during a serosurvey that produce a positive result by the virus neutralisation, IgM or IgG tests may be the result of vaccination rather than infection. However, as recombinant vaccines are unable to stimulate immune responses against non-structural proteins (NS1), it should be possible to determine whether a vaccinated animal has been naturally exposed to WNV by testing serum for the presence of anti-NS1 specific antibodies. An epitope blocking ELISA test has been developed but awaits validation in equine sera.

WNV is a re-emerging disease that has spread very rapidly across the entire North American continent in a relatively short space of time and continues to cause disease in horses and humans both in Europe and America. Its control depends on appropriate surveillance strategies for which adoption of accurate and validated diagnostic procedures is key.

Further reading


