



West Nile Virus: What is happening in Europe?

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West Nile virus is one of the most widespread arboviruses in the world, causing epidemic outbreaks of great virulence. In the virus cycle, the main hosts are mosquitoes and birds, although both humans and equids can be accidental hosts of the virus. In the case of horses, the infection can range from asymptomatic status to a picture of neurological symptoms; among which are symptoms such as weakness, ataxia, abnormal mental status, fever, muscular fasciculations, cranial nerve deficit, anorexia or teeth grinding, among others until it produces the death of the animal.

The fever / encephalitis caused by this virus can have serious health repercussions, and the fact that it can spread internationally quickly makes it one of the diseases included in the International Health Regulations of the World Health Organization (WHO, www.who.int), as well as on the list of mandatory reporting diseases of the World Organization for Animal Health (OIE, www.oie.int). According to the ECDC, 2018 was the year with the highest number of registered cases in the entire historical series. In total, in the EU during the last year 1503 human cases were declared, with a total of 181 deaths. In the case of horses, 285 outbreaks have been reported in 2018, including the 9 cases reported in Spain.

In total, in the EU during 2018, 1503 human cases have been reported, highlighting the 576 in Italy, 311 in Greece, 277 in Romania or the 215 in Hungary. Unfortunately, in 2018, 181 human deaths were reported in the EU due to this virus, with Greece being the country with the most deaths (47), followed by Italy (46) and Romania (43). For its part, horses reported 285 outbreaks in 2018 in the EU, excluding 149 in Italy, 91 in Hungary or 15 in Greece. In Spain, 9 cases were officially reported in 2018. These data reveal a great difference in the official declaration of cases in equids between countries such as Spain and Italy, when they show a very similar climatology and surveillance data in mosquitoes.

According to the Epidemiological Report of the West Nile Fever carried out by the Ministry of Agriculture, Fisheries and Food in 2018, mosquitoes with the capacity to act as vectors in the transmission of this disease are distributed throughout the Spanish territory, which due to its characteristics climatic conditions and geographic location of migratory birds to Africa, meets the ideal conditions for the transmission of this disease. However, the number of cases officially declared in the last ten years has been decreasing, circumscribing mainly Andalusia and sporadically Extremadura and some other region. As the results of this study reveal, the prevalence of antibodies among horses in our study is quite high, so we suspect that the prevalence of the virus has not really decreased in recent years, but that what has occurred is a decrease in the number of declared cases of the disease by veterinarians. This situation puts at risk not only the horse herd but also the people, since it is a public health problem. Knowing the cases of disease that occur in horses through the official declaration to the competent authorities, as well as monitoring the epidemiological situation of horses without clinical symptoms, we can identify the risk areas and thus put the necessary measures to prevent transmission, the susceptible equidae, as well as the people, the other susceptible host. In humans, the main measure of prevention would be the fight against culicid vectors, lacking a vaccine against the disease. In the case of equidae, in addition to the control and fight against vectors, it is also recommended to vaccinate those populations of equidae that are in areas of high risk of WNV transmission, such as those that present stagnant water that may represent real breeding sites of mosquitoes. It is also recommended to vaccinate equidae that are in open-air housing where the prevalence of WNV is high or that have an allergy to the bite of culicids.

Clinical signs

- Ataxia (72%)
- Weakness (94%)
- Abnormal mentation (67%) (Fig.1)
- Muscle fasciculations (61%)
- Cranial nerve deficits (44%)
- Fever (65%)
- Anorexia (57%)
- Teeth-grinding (20%)

Diagnosis

- Serology
 - ELISA
 - Fixation of the complement
 - Inhibition of haemagglutination ****
- RT-PCR and immunohistochemistry of nervous tissue (Fig 2)



Treatment

There is no specific treatment against West Nile virus. The treatment is based on the support (fluid, antiinflammatory) and prevent the horse self-injury. It is necessary to avoid ulcer by decubitus in recumbent horses and provide water and food. The use of corticosteroids is controversial. Tranquilizers such as acepromazine can also be used in those horses that are difficult to handle. Drugs that increase the degree of ataxia should be avoided.

Prevention

- Decrease vector insect load
- Vaccination programs

Given the implications in Public Health, it is absolutely necessary to warn the competent Authorities before the suspicion of equines with symptoms compatible with the WNV.

RECOMMENDED READINGS

- Enger et al. European surveillance for West Nile virus in mosquito populations. *Int J Environ Res Public Health*. 2013 Oct 11;10(10):4869-95.
- <https://ecdc.europa.eu/en/publications-data/west-nile-fever-europe-2018-human-cases-compared-previous-seasons-updated-16>
- Porter et al. West Nile virus encephalomyelitis in horses: 46 cases (2001). *J Am Vet Med Assoc*. 2003 May 1;222(9):1241-7.
- Rizzo et al. West Nile virus transmission: results from the integrated surveillance system in Italy, 2008 to 2015. *Euro Surveill*. 2016 Sep 15;21(37)



Figure 1. Frisian horse affected with West Nile Virus showing abnormal mental status.



Figure 2. Focal hemorrhages in the cerebral hemispheres and cerebellum in a horse severely affected with West Nile Virus