Viral diseases in horses

There are many viral diseases that affect horses, and even some of them have been known for several centuries. This is the case of the equine infectious anaemia, reported for the first time in France in 1843.

Today, several of them have a negative impact around the world in the sport horse industry, causing substantial economic losses, especially as they are related with the restriction of the movement of horses that compete in sporting events (e.g. African horse sickness and the Olympic Games in 1992). The European Union has established guidelines and decisions to take into account, which we indicate on the slide.

The viruses that can infect horses are grouped into 16 different families. Most of them are enveloped and have RNA genome. Several families include viruses that cause very important diseases, both for their severity and their ability to disseminate, and thus they are included in the list of notifiable diseases to the World Organisation for Animal Health (OIE). Others produce zoonoses.

The most relevant equine viruses are those affecting:

The respiratory tract: eight different species are involved, including, the rhinopneumonitis virus and the equine viral arteritis virus, both of them notifiable diseases, and influenza and parainfluenza 3 viruses, because they are zoonotic.

We must also highlight the group of viruses that affect the central nervous system. Among them there are six species of virus that may affect humans, causing encephalomyelitis in both species and that are notifiable.

We will describe two important viruses in horses and we will focus on the diseases that they produce. These viruses are:

- Equine arteritis virus, which belongs to the family *Arteriviridae* and
- West Nile fever virus, which belongs to the family *Flaviviridae*.

Both viruses contain a genome of single-stranded RNA of positive sense. They are enveloped and, therefore, they are labile to the action of environmental conditions. They also coincide in that they cause notifiable disease.

First of all we will talk about the **equine viral arteritis**.

It is a disease of worldwide distribution, with the exception of Japan, Iceland and New Zealand. It affects the equine reproductive and respiratory systems.

The most important routes of transmission are the respiratory secretions from infected animals and the semen of stallions that are unapparent carriers of the virus. The first route is frequent when horses concentrate on the racetracks, in sales, exhibitions and other events. We must comment that, it can also be transmitted between individuals by fomites and vertically from mother to foetus.

The prevalence of equine viral arteritis virus varies significantly between the breeds of horses. In Europe, the highest seroprevalence occurs in riding horses.

In general, the clinical signs include fever, loss of appetite, depression, leukopenia and nasal mucous discharges. The infection often goes unnoticed and it rarely causes the death of the animal. However, abortions occur in pregnant females and in neonates the infection causes interstitial pneumonia, which is fulminant and severe.

With regard to the prevention and control we must comment that in Europe there is an inactivated vaccine legalized for its use in England, Ireland, France, Hungary and Denmark. Without a doubt, the best control is:

- To identify the stallions which are unapparent carriers and that act as reservoirs of the disease.
- And to protect the pregnant mares that must be separated from the other horses in small groups, according with the expected date of delivery.

The second disease that we want to highlight is **West Nile Fever**.

It is a disease that affects humans, horses and some birds. It is native to the African continent and that has currently spread to North America, Asia, Australia and Europe. In the majority of the affected individuals there are few clinical signs, but some develop a serious and fatal neurological disease.

The birds are the reservoir of the virus. The circulation cycle occurs when a mosquito bites an infected bird, by which it acquires the infection, acting thereafter as a carrier or vector, spreading the virus from one bird to the other, or to other animals, thus amplifying the transmission cycle. As a curiosity we comment that crows are the most sensitive birds to infection, and therefore, monitoring programmes usually include the detection of dead crows.

In horses and humans the virus is directly transmitted only by mosquitoes (not from horse to horse, or from horses to humans or between humans), since fortunately, although clinical signs occur the amount of virus in blood is small and so contagions do not occur. However, it must be taken into account that during the mosquito season horses and humans may be at risk.

In horses, the clinical signs of the neurologic disease may include lack of appetite, depression, tripping, muscle contraction, partial paralysis, decreased vision, head pressure, teeth grinding, unsteady gait, convulsions, circling and inability to swallow. Finally, it can cause coma and death.

There is no specific treatment for the disease, prevention being the best control. In such prevention it is essential to control the mosquito populations, aiming at identifying the local species and destroying their breeding grounds. Individual protection is also important through the use of insect repellents, as well as avoiding outdoor activities during dusk and dawn, when mosquitoes are most active.

There is a vaccine for horses, but not for humans.

An Arab proverb says: "The air of heaven is that which blows between a horse’s ears"

Thank you very much for your attention!