Viral diseases of dogs

Welcome. Today we are going to see the viral diseases that may affect dogs.

Humans and dogs have shared for more than 10 thousand years a long history in common. They are not animals for husbandry or production, but they have great value because they protect us, they cooperate in certain jobs, participate in some sports, and above all, because they are a loyal and caring friend.

Obviously the diseases that affect them, and specifically those of viral origin, have a great relevance, both for sentimental and economic reasons, as well as by the possible zoonotic consequences.

We currently know 26 species of virus that may infect dogs. Fortunately not all have clinical relevance. These 26 species are grouped into 15 different families, depending on the type of nucleic acid (DNA or RNA) that they have, and according to whether or not they are enveloped. As you know, the envelope is the outermost element of their structure.

The most numerous group of canine viruses are those with an RNA genome, as it includes 10 viral families. Within these, the enveloped ones. On the contrary, there are only five families with DNA genome.

If we look at the representative drawings of each of the viral families, we can see that they have a varied morphology (rounded, bullet-shaped, filamentous, or icosahedral with projections), as well as different sizes being viruses of the family *Poxviridae* those of larger size, while the parvoviruses are the smallest.

An important feature and inherent to the presence of whether or not they are enveloped, is that naked viruses can remain stable in environmental conditions, while the enveloped viruses are labile.

On the other hand the number of species of viruses that encompass the families varies; there are 8 families that include a single species of canine virus, and 7 families which encompass two or more species. If you want to see which species of virus is included in each family remember to consult the additional material.

Taking into account the great importance of the zoonotic character of some viruses, i.e. their ability to be transmitted to humans, we would like to highlight three families: *Filoviridae*, *Orthomyxoviridae* and *Rhabdoviridae*, being without doubt the family Rhabdoviridae the most important since it includes one of the best-known and problematic species, the **rabies virus**.

Canine viruses are capable of affecting different organs or systems. Only two of them have a single body organ or system as target. Here we include the infections that affect the **heart**, produced by canine parvovirus 2, and infections that affect the **liver**, caused by canine infectious hepatitis virus. We can also highlight the canine coronavirus 1 species pantropical strain as the only species that produces systemic infection.

However, infections affecting the skin, the respiratory and gastrointestinal tracts and the central nervous system, may be produced by different species of canine viruses. In this regard please note that the central nervous system is target of 10 different viral species, being especially important the pathologies relative to infections caused by rabies virus, canine distemper virus, and canine parvovirus type 2.

With respect to the severity of the pathologies that they cause, only three viral species stand out for their morbidity, which is the incidence and prevalence of the disease, and for the lesions

and mortality produced in the affected dogs These are the parvoviruses (which is DNA virus) and the rabies and distemper viruses (both RNA).

As we know, there is no specific drug therapy for viral diseases and therefore, we must control these diseases using programs that prevent infection through the vaccination of animals. These programs depend on various factors related to: age and breed, physiological, and immune status activity, fitness, and geographical area. Here you can see the generic recommendations to be followed in vaccination protocols.

On the next slide we present a table with the recommendations of vaccination programs of the European Union for dogs. The viral diseases included are distemper, Parvovirus, coronavirus infections, infectious hepatitis, canine infectious respiratory disease (that includes parainfluenza and adenovirus) and, finally rabies.

Finally, we want to insist on the recommendation that you make a self-assessment, as well as you know and check a brief list of references, included in the additional material, that will allow you to expand your knowledge.

Thank you very much for your attention!