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Nurse

Canine Cognitive Dysfunction

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Introduction

Interest in studying the aging process in dogs has increased significantly. One factor that has been most studied is that of the aging of the brain and behavioral changes associated with age.

Dementia is referred to, in human medicine, as a variety of clinical syndromes characterized by a loss of intellectual ability which incapacitate the person who suffers it to perform common tasks of daily living. The most common variety of dementia in the elderly is Alzheimer's disease, often called senile dementia of Alzheimer type and age is their main risk factor.

A clinical definition of dementia in dogs has not yet been stated in dogs. However, similar symptoms in dogs to those of human dementia has long been identified. The cognitive dysfunction syndrome in dogs also called "canine Alzheimer's disease" is characterized by disorientation, impairment of activity and sleep, changes in learned behaviour and alterations in interaction with family members. It is important to stress that this is a diagnosis of exclusion, being that it is necessary to rule out other disorders that the animal could endure, and it is highly advisable to refer the case to a specialist in veterinary neurology before beginning any treatment.

The aged canine brain presents a number of morphological changes seen in humans, although neural fibers networks of tau protein, which are a diagnostic feature in the human Alzheimer's disease, have not been found in dogs. The accumulation of senile plaques containing beta-amyloid protein is also a typical feature of Alzheimer's disease in humans. Amyloid deposits may occur in the brain of geriatric dogs however typical canine plaques are diffuse and do not present a neuritic halo with a prominent nucleus, and therefore do not meet the criteria of the classic human plaques.

Recognition of the problem. Symptomatology

The symptoms of an aging brain may be difficult to diagnose during a routine consultation; these signs can be very subtle but progressive and are unfortunately often ignored or accepted by the owners of dogs as part of the animal's natural aging process. We must bear in mind that only 10% - 20% of senior animals are regarded as such by their owners.

Moreover, it is known that large and giant breeds can show changes in the brain tissue from 5 years of age or even earlier.

Recent studies show that changes in behavior, present in 75% of dogs seven years old and up, are due to premature aging of the brain. These are not signs of the brain normal aging process and can be fought against with appropriate treatment.

The set of symptoms that appear most frequently in the canine cognitive dysfunction are included in the DISH System (Disorientation, Interacts less, Sleep pattern disturbed, House training lost)

DISORIENTATION

- Has trouble moving around within the house
- Has trouble moving around within the house
- Seems lost in family environments
- Fails to sometimes recognize individuals or familiar environments

- Lower alertness and possessive behavior
- Reduction in its ability to be alert - walks aimlessly
- Stares at the wall or into space

INTERACTS LESS

- Lack of interest in being petted or to receive affection
- Doesn't seek attention
- Doesn't greet family members warmly sometimes
- Not interested in being greeted
- Spends less time playing with family members or with other dogs
- Ignores when being disturbed

SLEEP PATTERN DISTURBED

- Sleeps more or less at night
- Wanders round the house at night
- Barks continuously during the night

HOUSE TRAINING LOST

- Doesn't ask to go out
- frequent accidents at home
- Loss of sphincter control

Nearly 50% of all dogs of eight or more years of age suffer from one or more of these behavioral changes associated with the brain ageing

DISH signs are progressive according to the different stages of the disease. Its appearance is subtle and gradually worsens, becoming clearer and more consistent with time. The dog may end up not responding when its attention is required and may even fail to recognize family members.

As we have said, it is important to remember that these symptoms are often ignored or attributed by the owners to the dog ageing and thus not paying any attention to it. Only 12% of dog owners inform their veterinarian about these signs

Diagnosis

The only certainty in diagnosis is based on the pathological study of a brain sample, from which the presence of microscopic accumulation of beta-amyloid protein can be confirmed.

The diagnosis in a live animal is presumptive. When a consultation to a veterinarian takes place on a dog with possible dementia, a cognitive dysfunction test must be carried out in the first place.

The test usually assesses behavioural changes that mainly affect six categories of conduct:

- 1) Confusion, consciousness, orientation in space
- 2) Relationships-social behaviour
- 3) Activity - increase / repetitiveness
- 4) Anxiety - irritability increase
- 5) sleep-wake-inverted day cycle / night routine
- 6) Learning and memory

Each section includes multiple rapid response questions (affirmative / negative)

Once it is determined that the symptoms observed are related to the cognitive dysfunction syndrome, test interpretation is quite simple.

We classify patients into three categories: PRE-DEMENTIA, DEMENTIA AND ADVANCED DEMENTIA.

- Pre-demented animal is one that shows one or more symptoms associated with any of the categories of the above sections, being on one section only.
- Dementia is confirmed if an animal is positive to 2 or 3 sections of the test questions (even if there are one or more affirmative answers).
- Advanced dementia is classified as so when there are symptoms in all categories.

In all cases if there are any symptoms at all there must be a temporal relationship between them meaning that the appearance of these symptoms has been sequential in time. The signs are insidious and progressive. The signs are subtle at the onset of illness, but as the disease progresses the signs are more obvious and the dog will gradually deteriorate

It is important to stress that this is a diagnosis of exclusion meaning that it is necessary to conduct a complete clinical examination with CBC and biochemistry tests to rule out diseases that can show any of the related symptoms. Ultimately the veterinarian has to exclude any other pathologies that are producing similar symptoms and that can lead to a misdiagnosis.

Differential diagnosis

It is important to bear in mind as the main differential diagnosis:

- Alteration of the sense organs
- Alteration of the locomotor apparatus
- Diseases of the urinary tract
- Hormonal and / or metabolic disorders
- Neurologic disorders or brain tumors
- Poisonings
- Parasitosis

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