



COGNITIVE DYSFUNCTION IN DOGS



Canine cognitive dysfunction (CCD) or 'doggie-dementia' is a behavioural syndrome that affects senior dogs.

CCD normally presents in dogs older than 9 years old, but this can be variable between breeds (i.e. some large breed dogs tend to develop age-related issues quicker than smaller dogs). This condition has been related to Alzheimer's in people as some of the features are similar between syndromes and, additionally, dogs have been used to study Alzheimer's disease.

As in Alzheimer's, the disease is progressive and, initially, the signs can be mild and mainly occur at night.

Why does my dog have CCD?

CCD is caused by gradual and degenerative age-related changes in the brain. The main cells of the brain are neurons which transmit essential information through the body. These neurons also regulate mental, physical and emotional interactions. In some older dogs, neurons start a process which involves changes in the environment inside and the accumulation of certain products. One of the degenerative changes that occurs is the build-up of a protein called beta-amyloid, which creates toxic conditions for neurons. Other changes occur in the brain of these dogs, such as small bleedings, increased thickness of the meninges of the brain, and reduction of the brain size (as a consequence of cells getting smaller and dying at the end of the process).

Consequently, the brain will start to fail in its normal function and, therefore, the behavioural changes will occur.

What are the most common clinical signs?

Although the clinical signs can occur at any point of the day, the dogs might be normal during the day but display the clinical signs during the night, especially in the initial phases. The most common signs include:

- + Disorientation — Getting lost in familiar places, stuck in corners, staring into space, decreased ability to distinguish familiar people or places, difficulties performing a previously learnt task.
- + Interaction changes — Suddenly clingy or avoidant, less affectionate towards familiar people, increased irritability or aggression, less tolerant to be left alone.
- + Sleep pattern changes — Wandering the house at night, sleeping more during the day, sleeping less during the night, vocalisation overnight.
- + House-soiling — Urinating or defecating indoors when they were previously house-trained, or evacuating in unusual areas at home.
- + Activity level changes — Decreased interest in playing or doing other activities, restlessness, pacing (especially overnight)

- + Anxiety — Increased anxiety, new phobias, irritability, aggression.
- + Learning changes — No longer responding to previously known commands or struggling to learn new ones.

How can CCD be diagnosed?

The initial steps involve performing a complete physical and neurological examination. Dogs with CCD display a normal physical and neurological examination unless there are other diseases associated to the behavioural changes (i.e. brain strokes or tumours).

- + Blood examination: Other systemic diseases could be causing your dog to have behavioural changes. In older dogs, liver, kidney and thyroid diseases could be causing behavioural and interaction problems. Please, check with your vet about performing complete bloodworks and urinalysis.
- + Brain imaging: MRI could show changes within the brain such as reduced size, brightness in some areas due to protein accumulation and increased ventricular areas (increased fluid inside the brain).
- + Cognitive tests: some cognitive tests could be performed at specific institutions. On the other hand, some tests with punctuation can be used at home, giving an objective measure of the level of CCD of your dog, and keeping track of the changes over time.

Can CCD be treated?

There is no one treatment or cure for CCD, and research is ongoing in this area. Any concurrent health conditions should be treated to diminish the clinical signs. That includes liver or kidney problems, arthritis, or obesity.

Treatment may include a combination of the following:

- + Diet: Certain prescription diets are rich in antioxidants, fatty acids and other important nutrients that help support the brain. Some new diets are rich in MCT oils which are a different source of energy for the brain.
- + Enrichment: Interacting with your dog regularly through play, varied or interactive toys, regular exercise and socialising with other pets might help to reduce the signs of CCD.
- + Medications: Some medications in the market might reduce the clinical signs. Selegiline is a medication that increases the dopamine and catecholamine levels in the brain but it can take up to a month to start causing effect. Propentofylline improves cerebral blood flow. Some anxiolytics can be used to reduce anxiety such as fluoxetine.
- + Supplements: A myriad of supplements, such as Akitvait, may help with CCD when combined with the tactics above.

Outcome

CCD is a slowly progressive disease that many elderly dogs experience. Early intervention with diet, enrichment and medications can help slow the progression of CCD and improve their quality of life. Dogs who are severely affected with CCD or who have other compounding medical problems often have a worse prognosis and may not respond well to therapies. Unfortunately, it is expected that the disease will progress over time but with the above measures, we can extend their quality of life.

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