Cannabidiol (CBD) in Canine Epilepsy

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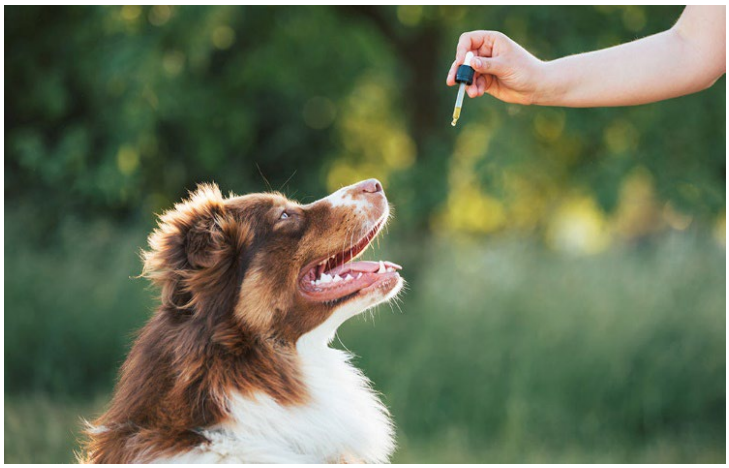
Idiopathic epilepsy is the most common neurologic condition in dogs. Despite the countless advancements in veterinary neurology, from neuroimaging to surgical procedures, treatment options for refractory epileptics remain limited. Cannabis-based therapies have gained considerable recognition over the last decade due to their use in human medicine to treat and manage various conditions, including epilepsy. Until recently, little was known about the safety, efficacy, pharmacokinetics, and side effects of cannabis in dogs. With the emergence of new clinical studies, practitioners can feel more confident in discussions with clients about the potential use of cannabis-based therapies in veterinary patients.

Cannabis sativa is an herbaceous plant native to central Asia. The plant contains over 100 cannabinoids, including tetrahydrocannabinol (THC) and cannabidiol (CBD). Cannabinoids target cell membrane receptors and alter membrane potential and neurotransmitter release, which can increase seizure threshold. Some cannabinoids also target endogenous cannabinoid receptors present in the body, namely CB1 and CB2, and can affect the release of excitatory and inhibitory neurotransmitters. THC, a cannabinoid well-known for its psychoactive properties, has toxic effects on pets and is not recommended for medical treatment in pets. In contrast, CBD is non-psychotropic and has demonstrated neuroprotective, anticonvulsant, and anxiolytic properties, among others, in human medicine. Therefore, CBD has become a focus for continued studies over the last five years about its application to manage canine epilepsy.

CBD is reported to have low bioavailability in humans and dogs and also goes through a high first-past effect in the liver. To address these challenges, CBD is often administered in oil-based formulations. The liver metabolizes CBD and inhibits several cytochrome p450 isoenzymes raising the concern for potential drug interactions. McGrath et al. (2018) initially reported on adverse effects associated with CBD in healthy dogs. In their study, 30 healthy Beagles were placed in three groups and administered CBD in either an oral capsule, transdermal cream, or oral oil suspension at doses of 10 to 20 mg/kg/day over a six-week period. All dogs in the study developed diarrhea, which was resolved with a course of metronidazole therapy. Elevations in alkaline phosphatase enzyme (ALP) were noted in over a 1/3 of the dogs with no evidence of hepatotoxicity based on normal fasting and post-prandial bile acids. The study concluded that CBD was well tolerated in dogs. A follow-up study by McGrath et al. (2019) evaluated the effect of CBD in addition to conventional antiepileptic treatments in refractory epileptic canine patients. In this randomized, controlled clinical trial, 26 client-owned dogs with refractory epilepsy were assigned to either a treatment group or placebo group for 12 weeks. The treatment group received a CBD oil suspension dosed at 2.5 mg/kg twice daily for 12 weeks. Sixteen dogs completed the study. A significant reduction of 33% in monthly seizures was noted in the CBD group, and an increase in ALP. It was also noted that there was a negative correlation between the change in seizure frequency and plasma CBD concentration. This is worth mentioning as it may indicate that higher doses of CBD are needed in canine patients than in humans. Bile acids were not measured in this study; however, serum Phenobarbital and Bromide levels were unchanged in the patients.



More recently, Garcia et al. (2022) evaluated the use of a CBD/CBDA hemp extract in refractory epileptic canine patients. In the six-month randomized double-blinded cross-over design study,14 dogs either received the CBD/CBDA hemp extract or placebo for three months and then switched over with no washout period. The dose administered in the treatment group was 2 mg/kg twice daily. All dogs in the study were on three or more antiepileptic drugs with no recent adjustments in dosing. Notably, six of the 14 dogs in the study showed a >50% reduction in seizure frequency on the CBD/CBDA hemp extract. ALP was again noted to be elevated; however, no differences were observed in serum Zonisamide, Phenobarbital, or Bromide concentrations, suggesting that CBD does not affect the metabolism of antiepileptic drugs. Mild ataxia and somnolence were noted in four dogs and three dogs, respectively, in the treatment group though this was not significantly different from the placebo group.

Based on the studies above, CBD appears to have a clear antiepileptic effect and is a reasonable and safe treatment option in conjunction with conventional antiepileptic medications for managing idiopathic epilepsy, particularly in refractory cases. Additional studies are warranted to evaluate optimal dosing further and assess efficacy in patients with various types of seizure disorders, but the current literature is promising. Obtaining CBD can be challenging as most formulations are only available online for purchase, and the quality of the product can vary considerably, so clients should use caution and seek out reputable brands.

Reference

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