

CBD: Multimodal management for atopy

In the ever-evolving world of veterinary medicine, it's essential for us to stay updated on the latest findings and treatment options for our patients. One area that's been gaining momentum is using plant-based medicine, particularly CBD, in treating various conditions in pets, including skin diseases like canine atopic dermatitis. While it's still early days in our understanding of how medicinal cannabis, specifically CBD, can benefit skin diseases, the information available to us is steadily increasing.

Understanding the endocannabinoid system in skin homeostasis

The skin serves as the body's first line of defense against pathogens, allergens and trauma, and regulates various vital processes such as temperature, water and electrolyte balances. Additionally, the skin has exocrine, endocrine and regenerative functions. Recent research has introduced us to the fascinating world of the c(ut)annabinoid system, which plays a pivotal role in maintaining skin homeostasis.

Cannabinoids and their influence on skin health

Recent dermatology findings have uncovered the significant impact of cannabinoids on skin health. Cannabinoids influence epidermal permeability, hair growth, inflammation, wound healing, itch pain and skin tumors. Endocannabinoids are produced by various skin cell types, including keratinocytes, sebocytes, melanocytes, sweat gland epithelial cells and macrophages. Endocannabinoid receptors have been identified on cutaneous nerve fibres, mast cells, keratinocytes and adnexal tissues. It's understood that endocannabinoids can control mast cell behavior, including the reduction of degranulation and histamine release.

Exploring the mechanisms

Endocannabinoids inhibit primary afferent fibre depolarisation and modulate mast cell degranulation by interacting with various receptors, including CB1, CB2, TRPV1, GPR55, GPR119 and PPAR- α . These interactions lead to reduced nociceptive fibre activity and a decrease in pro-inflammatory and pro-pain mediators, resulting in reduced inflammation and pain. The activation of CB2 receptors on mast cells modulates degranulation. It suppresses pro-inflammatory response, reducing the release of peripheral mediators of nociceptors, such as nerve growth factor (NGF), serotonin, histamine and cytokines. In dogs, nerve growth factor (NGF) has been identified as a key mediator in pruritogenic pathways.

The role of endocannabinoids in canine skin

In atopic skin, endocannabinoids like 2-AG and AEA, as well as other endocannabinoid-like mediators, are found in significantly higher levels compared to non-lesional skin. Ongoing research is exploring cannabinoid and cannabinoid-related receptors in various inflammatory cells, such as

macrophages, dendritic cells, T-lymphocytes and neutrophils. Manipulating these inflammatory cell functions with endocannabinoids and cannabinoids could provide a novel approach to treating atopic dermatitis.

The power of cannabinoid receptor agonists

Studies have shown that cannabinoid receptor agonists can reduce skin inflammation, while receptor antagonists exacerbate it. CBD has been found to inhibit the enzymes FAAH and MAGL, responsible for breaking down endocannabinoids. This inhibition strengthens the endocannabinoid tone, reducing scratching behaviour and skin inflammation. Various studies have highlighted the antipruritic effects of endocannabinoids, demonstrating the benefits of topical and systemic treatments to alleviate itching.

Addressing canine atopic dermatitis

Canine atopic dermatitis is a common and multifactorial allergic skin disease, impacting up to 27 per cent of dogs. Caused by immune and skin barrier dysfunction, atopy often requires a multimodal approach. While several pharmacological and dietary options are available for treatment, CBD offers a promising avenue for regulating the immune system, restoring skin barrier properties and helping manage the atopic dermatitis patient.

Promising research and future considerations

Preliminary research shows promising results. Dr. Andrew Rosenberg DVM DACVD conducted a study demonstrating that CBD can reduce pruritus in dogs with canine atopic dermatitis. Another double-blind, placebo-controlled clinical trial exhibited a significant improvement in CADESI scores for dogs on CBD treatment compared to placebo group.

Dosing considerations

Dosing with CBD remains highly individualised, with the recommendation to start low and gradually increase to find the desired effect. Condition-specific dosing of 0.5-1mg/kg BID has been suggested, though this will vary depending on patient signalment, other medical conditions and other pharmaceutical and nutraceuticals being administered.

CBD use in treating canine atopic dermatitis is a fascinating and evolving field. As veterinarians, it's vital for us to keep an eye on further developments in this area, as it could offer a valuable adjunct to our existing treatment options, especially when dealing with comorbidities or unwanted side effects from other medications. The findings to date highlight the protective role of the endocannabinoid system in skin allergies, with future treatments focusing on cannabinoid receptor agonists to attenuate inflammation and improve skin barrier function.

Reach out to the PetCann team to learn more about the rapidly growing area of plant-based medicine.

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