

Phytocannabinoids in the Treatment of Acne Vulgaris

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ABSTRACT

Objective: This clinical review examines the physiological effects of various non-psychoactive phytocannabinoids (pCBs) from the cannabis plant and how they may be utilized in the treatment of acne vulgaris at the clinical level.

Methods: Starting in Fall 2018, a keyword search within online databases accessed from The University of Findlay Shafer Library website was conducted to gather data.

Results: The studies evaluated in this review revealed that cannabidiol (CBD) exerts an “anti-acne triad” composed of lipostasis, anti-proliferation and anti-inflammation.⁶

Discussion: Phytocannabinoids such as CBD and tetrahydrocannabinol (THCV) are promising pCBs for topical treatment of acne vulgaris and could be used in place of current treatment options available. Future clinical trials of CBD and THCV topical preparations could lead to significant changes in the way acne is treated in the U.S.

INTRODUCTION

Acne vulgaris is one of the most common dermatologic conditions and affects up to 85% of adolescents in their lifetime.^{1,2} There are four main components of the pathogenicity of acne vulgaris, which include inflammation, *Propionibacterium* acne colonization, follicular hyper-keratinization and excess sebum production.¹ With adverse skin reactions to current treatment options and growing bacterial resistance to antibiotics, it is essential to find new treatment options that are equal to or even more effective than current treatments.

Cannabidiol (CBD) is one of hundreds of phytocannabinoids produced by the cannabis (*Cannabis sativa*) plant, also known as marijuana.³⁻⁵ CBD is not psychoactive like its counterpart tetrahydrocannabinol (THC) and has become a promising chemical in modern medicine since the approval of various CBD-containing drugs by the FDA.² The use of cannabis remains controversial among healthcare providers and government agencies in the United States, but quality research and education could help healthcare providers decide if CBD is a viable drug for the treatment of acne vulgaris.



RESULTS

CBD normalized lipid synthesis of human sebocytes by inhibiting the lipogenic actions of arachidonic acid, linoleic acid and testosterone.⁶ CBD also decreased sebocyte proliferation.⁶ CBD prevented gram negative and positive infections from elevating TNFA expression/signaling and showed anti-inflammatory effects.⁶

Other non-psychoactive pCBs similar to CBD were examined to determine their effectiveness in the treatment of skin conditions such as acne vulgaris.⁷ Cellular sebocyte viability seemed to change in a dose dependent manner in regard to the concentration of pCB administered.⁷

The pCBs such as CBC, CBDV and THCV greatly reduced lipogenesis (acted as lipostatic agents) by reducing the action of arachidonic acid (AA).⁷ The other pCBs such as CBG and CBGV were found to increase the actions of AA and had pro-lipogenic effects.⁷ Out of the pCBs that induced lipostasis, THCV was the most effective at suppressing sebocyte proliferation and also contributed to reducing inflammation.⁷

Applying 3% Cannabis seed extract cream to the right cheek resulted in decreased sebum levels and erythema in comparison to the control (left cheek).⁸

By week 12, there was an approximate -35.00% change in skin sebum values for the cannabis treated side and there was an approximate -10.00% change in skin erythema values for the cannabis treated side.⁸

CONCLUSIONS

CBD exerts an “anti-acne trinity” composed of lipostasis, anti-proliferation and anti-inflammation.⁶ By controlling these characteristics, CBD can put a stop to the continuous cycle that characterizes acne vulgaris development.

Another pCB, THCV, is described as “CBD-like.” THCV was able to decrease sebocyte proliferation without affecting cell viability and also reduce inflammation.⁷

Not all the pCBs examined were lipostatic. In fact, CBG and CBGV were both pro-lipogenic and “endocannabinoid-like.”⁷ This shows that pCBs may also have clinical promise in treating dry skin conditions as well, such as atopic dermatitis.⁷

Topical administration is the most rational method of delivery due to the fact that CBD as well as other pCBs are highly lipophilic compounds.^{6,7}

Multiple studies have previously proven the safety of using CBD, and it has already been used clinically in medications such as Sativex and Epidiolex without any significant side effects.⁶

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