

Cannabinoid Toxins as a Pharmaco-Therapeutic Treatment Option for Pro Fungal Infections

Robert Henry Richards*

Institute of Pharmacology and Toxicology, Rostock University Medical Centre, Schillingallee 70, D-18057 Rostock, Germany

Corresponding author:

Robert Henry Richards

✉ grace6vanathim@gmail.com

Institute of Pharmacology and Toxicology, Rostock University Medical Centre, Schillingallee 70, D-18057 Rostock, Germany

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Abstract

It has been demonstrated that the endocannabinoid system is involved in a variety of skin functions, including melanogenesis, the maintenance of redox balance in UV-exposed skin cells, barrier functions, sebaceous gland activity, wound healing, and the immune response of the skin. Cannabinoid compounds and derivatives are intriguing as potential systemic and topical treatments for a variety of inflammatory, fibrotic, and pruritic skin conditions in addition to their potential use in the treatment and prevention of skin cancer. Androgenetic alopecia, atopic and seborrhoeic dermatitis, dermatomyositis, asteatotic and atopic eczema, uraemic pruritis, scalp psoriasis, systemic sclerosis, and venous leg ulcers have all been successfully treated with cannabinoid compounds. The current body of research on cannabinoid compounds as potential treatments for skin diseases is examined in this review.

Keywords: Cannabinoids; Receptors For cannabinoids; Dermatitis atopy; Dermatomyositis; Fibrosis; Inflammation; Pruritus; Psoriasis; Sclerosis systemic; Healing of wounds

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Introduction

Patients may gain from using cannabinoids to treat skin conditions, according to numerous studies. We highlighted the effects of cannabinoids on skin cancers like melanoma and squamous cell carcinoma in a recent review paper [1]. Cannabinoids may also be useful for patients as systemic and topical applications in inflammatory, allergic, fibrotic, and pruritic skin diseases as well as skin care, according to numerous publications in recent years. Dermatologists may therefore be particularly concerned about these effects. With growing commercial interest, the application of cannabinoids to skin diseases has continued to gain attention [2].

In a 2007 comprehensive study, cannabinoid receptors had a significant impact on the pathogenesis of allergic contact dermatitis, demonstrating the importance of the endocannabinoid system in skin homeostasis [3]. Cannabinoid-triggered receptor regulation in pathophysiological skin conditions, as well as the possibility of testing cannabinoid-based drugs for a variety of skin diseases, has all been the subject of numerous publications since this groundbreaking study's publication. In the meantime, the endocannabinoid system has been linked to a number of skin physiological processes, including melanogenesis, the

maintenance of redox balance in response to ultraviolet (UV) radiation, wound healing, the functions of the barrier, the control of immunological sensitivity, the functions of the sebaceous gland, and hair growth.

Discussion

The aim of the present review is to summarise the currently available knowledge on the effect of cannabinoids on the pathogenesis of various selected skin diseases in the context of the respective existing pharmacotherapy. The presentations of the pharmacotherapeutic options currently used for the individual indications provide an insight into the drugs competing with cannabinoids and are intended to further identify potential combination partners in cannabinoid therapy that may be able to achieve synergistic effects in upcoming clinical trials [4]. To this end, the components of the endocannabinoid system are first described in general terms, and then their distribution and function in the skin and their regulation under pathophysiological conditions are outlined. Finally, the individual preclinical and clinical results of the meanwhile numerous studies on the effects of cannabinoids in skin diseases are presented.

Atopic dermatitis treatment with PEA and adelmidrol was the subject of two 2007 studies [5]. A study with 25 children and 18 adults found that a cream with PEA sped up the healing of a neurodermatitis flare-up on the side of the body being treated and extended the time before another flare occurred [6]. Another pilot study of 20 patients with mild atopic dermatitis found that treatment with 2% adelmidrol improved erythema and psoriasis in 60% of patients after 10–15 days, with complete resolution in 80% of patients after 4 weeks [7]. CBD failed to meet the primary endpoints of a recent study on the effects of CBD (BTX 1204) on atopic dermatitis. JW-100, a novel CBD and aspartame formulation, showed significant improvements in atopic dermatitis after 14 days of topical application [8]. A more recent investigation confirmed the lack of effect of CBD.

Half of those who received treatment for mild-to-moderate atopic dermatitis did not experience any symptoms at all. The effects that had been observed in a pilot study with a smaller number of patients were confirmed by the authors here.

In the most recent study, 67% of the 16 patients who completed it reported less itchiness, and 50% said their eczema had improved by more than 60%. Patients with atopic dermatitis reported a decrease in skin dryness and itching as well as a reduction in the use of skin medication after using hemp seed oil in another study [9]. However, the authors of this study came to the conclusion that this effect was caused by hemp seed oil's high content of polyunsaturated fatty acids rather than specific cannabinoid

effects. The CB2 receptor agonist S-777469 is additionally being researched for the treatment of atopic dermatitis [10]. S-777469's safety, tolerability, pharmacokinetics, and pharmacodynamics were examined in patients with mild-to-moderate atopic dermatitis in this randomised, placebo-controlled, double-blind, multiple-dose study. A potential anti-inflammatory and anti-pruritic effect was evaluated as a secondary outcome. However, the study's findings have not yet been made public. In a single-blind clinical trial with 20 healthy volunteers, a potential anti-inflammatory effect of CBG in a model of contact dermatitis caused by sodium lauryl sulfate skin irritation was investigated. Here, transepidermal water loss and redness were reduced by CBG better than by placebo.

Conclusion

Finally, the possibility of intervening pharmacotherapeutically with active substances in systems whose target structures contribute to a natural homeostasis of skin functions is of great interest for the therapy of skin diseases. The endocannabinoid system clearly belongs to these systems.

Acknowledgement

None

Conflict of Interest

None

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