

THERAPEUTIC HOTLINE

Management of chronic pruritus with a UV filtering topical cream

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ABSTRACT: Chronic pruritus is a common dermatological condition affecting 10–13% of the general population. UVB phototherapy has been demonstrated to be effective in relieving the symptoms of pruritus. However, phototherapy is rarely administered because the treatment is time-consuming and expensive, when compared to other topical drugs. In previous works, it has been reported that a topical cream, which selectively filters solar UVB can be used as a convenient alternative to traditional phototherapy. Here, we report the results of a pilot study aimed at assessing the effectiveness of the cream for treating pruritus. Seven patients with pruritus symptoms were included in the study. After 3 months of treatment (3 sessions per week), all patients noted improvement in pruritus symptoms. These preliminary results demonstrate that the novel topical cream could provide a convenient, low cost treatment for chronic pruritus patients.

KEYWORDS: atopic dermatitis, eczema, phototherapy, pruritus

Introduction

Pruritus is one of the most frequent symptoms reported in dermatology; it can occur in acute or chronic forms. The chronic form (lasting 6 weeks or more) is often intractable and significantly affects the quality of life of patients (1). Recent surveys indicate the point-prevalence of chronic pruritus to be around 13.5% in the general adult population (2). Chronic pruritus can be divided into four subtypes according to its origin: dermatologic, systemic, neuropathic, and psychogenic (3). Due to different underlying etiologies, there is still no widely accepted treatment for managing pruritus. Topical therapies are the most common therapeutic options for mild and localized

pruritus. Antihistamines and topical corticosteroids are used to relieve itch associated with inflammatory skin diseases such as atopic dermatitis and psoriasis. Additionally, moisturizers, emollients, and other topical creams can improve skin barrier function against entry of irritants and itch-causing agents (4,5).

The effectiveness of ultraviolet (UV) phototherapy (e.g., UVA, broad-band UVB, narrow-band UVB, and psoralen plus UVA) is well-documented for the treatment of chronic pruritus of different origins (4–6). Unfortunately, successful treatment with phototherapy is limited by patients' compliance and costs. The sun generates an abundance of free, easily accessible UV radiation. Although, the majority of the UV content of solar radiation is nontherapeutic for skin conditions, this natural source of radiation can be exploited to treat skin disorders if the radiation is biased toward therapeutic wavelengths (7–9). In previous works, we have reported the development of a topical

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Table 1. Patients' self-assessment of pruritus symptoms before and after treatment

Patient #	Sex	DOB	Patient self assessment		Global photographic
			Before treatment	After treatment	Assessment
1	Female	1985	2	0	Noted improvement
2	Female	1985	8	1	Noted improvement
3	Female	1973	10	0–6	Noted improvement
4	Female	1965	5	1	Noted improvement
5	Female	1993	9	3	Noted improvement
6	Female	1957	8	1	Noted improvement
7	Female	1993	10	3–5	Noted improvement

cream, which selectively filters solar UV (10–12). The cream contains a combination of UV-absorbing molecules, which, unlike a sunscreen, biases radiation from the sun toward a therapeutic wavelength of 311 nm (11).

The beneficial effects of filtered UVB radiation for dermatological diseases, was first observed at the Dead Sea in Israel. At the Dead Sea, the extra thickness of the atmosphere (400 m) attenuates the lower range of the UVB spectrum (13). Our topical formulation biases solar radiation in a similar manner; thus, the effective radiation delivered to the skin is comparable to UV at the Dead Sea. In clinical trial, the cream demonstrated results on par with NB-UVB in the treatment of psoriasis and vitiligo (10–12). The aim of this pilot study was to evaluate the safety and the effectiveness of the cream for treating pruritus. Given that traditional phototherapy conducted at a clinic is usually reserved for moderate to severe skin diseases, we hypothesized that the more convenient, at-home option would have greater benefits for patients with pruritus.

Methods

Patients

Seven patients diagnosed with chronic pruritus secondary to atopic dermatitis clearance were selected from the principal investigator's patient population. All patients were women, with average age of 32.3 ± 5.29 years. Each patient was screened for skin malignancies and prior failure to respond to phototherapy. All patients gave informed consent and the privacy of the patient's data was strictly observed. During the course of the study, no other topical medications were used (e.g., topical steroids). Many of the patients had tried other treatments, unsuccessfully. Patients were interviewed before treatment and

asked to rate their level of discomfort from pruritus on a scale from 1 to 10.

Treatment

During the treatment, each patient applied the investigational cream to areas of pruritic skin and a broadband SPF 50 sunscreen to the nonaffected sun-exposed areas. Patients were instructed to apply approximately 2 mg/cm^2 of cream, variations from this amount were expected. During each treatment session, patients were exposed to natural sunlight at home. A phone-based system was developed to calculate exposure times based on current weather, time of day, and global position. Calculated exposure times reported to the patients at each session were based on a standard minimal erythema dose, taking into account skin type of each patient as well as the UV index at the time of treatment. The average treatment time was 32 minutes and the average UV index was 9. Patient's condition was monitored monthly by the principle investigator. At each visit, the patients were asked to rate their level of discomfort on a scale from 1 to 10. Global photographs were taken to track changes in appearance.

Results

Table 1 reports the patient self-assessment of pruritus symptoms before and after the 3-month treatment. All patients showed improvement. Also reported are the physician assessed global photographs taken before and after the pilot. No adverse events were reported during the study and the 30 days follow-up period.

Discussion

Pruritus is an unpleasant sensation of the skin that provokes the urge to scratch. When chronic,

it significantly decreases the quality of life for patients. Pruritus can interfere with work, sleep, and the activities of daily living. Narrowband UVB is the most common form of phototherapy used to treat skin diseases. Its efficacy in pruritus treatment is well-documented (5,14). The exact biochemical events underlying the therapeutic effects of phototherapy are not known. However, the relief of pruritus symptoms could be ascribed to the inhibition of release of chemomediators or a reduction in sensitivity to such mediators. For now, only the modulatory effects of phototherapy on histaminergic system have been reported (15).

Phototherapy treatment is time-consuming (both for the patients and hospital staff) and financially demanding. As such, many pruritus patients are prescribed other treatments and are not often given a phototherapy option (16). To address these problems, we developed a topical treatment that can be used in conjunction with endogenous UV radiation from the sun. Given the at-home feature of this drug, the topical cream could provide a convenient alternative to artificial light phototherapy for patients.

The abundance of the sun combined with the lower cost of the treatment could increase patient's compliance and satisfaction with phototherapy. Phototherapy using the UV biasing cream has been shown to compare favorably to NB-UVB in the treatment of vitiligo and psoriasis (10–12). The results of this pilot study clearly show the safety and the efficacy of this innovative therapeutic approach for the treatment of pruritus. This self-administrable treatment option could be used for patients with other mild skin conditions where traditional phototherapy is not advised due to the aforementioned reasons. A larger study is now underway to further study the safety and efficacy of the novel cream for the treatment of pruritus.

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