Clothes-on PUVA in psoriasis: Single blind randomized comparative trial on 21 patients

Sachin Varma, Sathish Pai Ballambat, Chandrashekar Balachandran, Shruthakirthi Shenoi, Smitha Prabhu
Department of Skin and STD, Kasturba Medical College, Manipal, India.

ABSTRACT

Background: PUVASOL therapy has an inherent drawback of patient compliance in that Indian female patients with psoriasis lesions on covered parts of the body are reluctant to expose themselves. In this study we tried to evaluate a new method of administering PUVA therapy wearing a fabric. Aim: To compare the efficacy and safety of PUVA administration with and without wearing clothes in psoriasis. Method: We first found the UV transmissibility of plain woven, lightweight cream colored cotton fabric with 30 x 30 threads per square cm. area and calculated its sun protection factor (SPF). A single blind, randomized, comparative, clinical trial was then conducted on 21 patients with psoriasis vulgaris who were treated with bath PUVA. The study group received ultraviolet light while wearing a gown made up of the above cotton fabric and the control group received ultraviolet light without wearing the gown. The study group was given an UV dose higher in proportion to the SPF of the worn fabric so that blockage caused by cloth could be neutralized. The cloth-uncovered areas were covered with a sunscreen. UVA from artificial light source was used for better patient monitoring. Results: After 12 PUVA treatments both the treatments were found to be equally effective, and there were no differences in the side effects. Conclusion: Thus we conclude that PUVA can be given wearing a fabric provided the UV dosage is increased proportional to the SPF of the fabric. The same fabric may be used for PUVASOL therapy.

Key Words: Psoriasis, PUVA, Textile, Sun protection factor

INTRODUCTION

Psoralen photochemotherapy is known to mankind since ancient times. It can be either given in the form of PUVA, using an artificial UV light source, or in the form of PUVASOL, with sunlight as the UV source. PUVA therapy, though precise and accurate, is expensive, requires a break from the work schedule, and is commonly available at referral centers only. PUVASOL is an age-old alternative. It is natural, convenient and is easily available in India. Hence PUVASOL still remains the most widely prescribed mode of psoralen photochemotherapy in India. PUVASOL has less acceptability in the general population as patients, especially females, with lesions on covered parts of the body are reluctant to expose these areas to sunlight. We evaluated a new method of administering PUVA therapy to patients with psoriasis wearing a fabric, with an increase in the UV dose in proportion to the sun protective factor of the worn fabric, so as to neutralize...
the blockage in UV dosage caused by the fabric. The results of this study could be extrapolated to PUVASOL therapy.

METHODS

SPF of the fabric
A lightweight, cream colored, plain woven, cotton fabric with 30 x 30 threads per square cm. area was chosen for the study and its UV light transmissibility was determined as follows. First, the UVA emitted by a Waldmann’s phototherapy unit was recorded using Waldmann’s photometer model LMA 302. The UV sensor of the photometer was then covered with the cloth and UVA emitted by the same chamber was recorded. This value was the UV rays transmitted through the fabric, and when divided by the first value and multiplied by 100 gave the percentage of UV rays transmitted by the fabric. The sun protective factor of the fabric was then calculated using the formula SPF = 1/t where t is the transmissibility.

Design
A single blind randomized comparative study was conducted. A simple full sleeve gown was tailored to suit the patients. Care was taken to see that the cloth was not doubled at any site and no inner lining was attached.

Subjects
Twenty-one patients with psoriasis vulgaris were randomly divided into two groups. The study group received bath PUVA therapy wearing the fabric and the control group without the fabric. The exclusion criteria were: pregnant female, age less than 12 years, plaque type of psoriasis involving less than 20% of body surface area, systemic therapy within the last 6 weeks, history of light sensitive disease and immunocompromised patients. Informed consent was obtained from all the participants.

Equipment
The equipment used for treatment was Waldmann PUVA 1000 unit equipped with 26 UVA lamps of 6 feet length. These lamps feature a radiation spectrum of 315 nm to 400 nm with a maximum at 355 nm, and an output of 10 mw/cm². The measurements were performed with a calibrated Waldmann’s photometer model LMA 302.

Treatment procedure
All the patients received 8-methoxypsoralen (8-MOP) bath water PUVA. Fifty milliliters of 0.75% 8-MOP was dissolved in 100 liters of water in a bathtub to give a final concentration of 3.75 mg/liters. The patients soaked themselves below the neck for 20 minutes. Immediately after wiping dry, the patients in the study group wore a gown and were then exposed to UVA light. Controls received UVA without gown. However in patients wearing the gown the UV dose was increased proportional to the SPF of the fabric so as to neutralize the blockage of UV rays by the cloth. The cloth-uncovered areas in these patients were protected using an opaque sunscreen to prevent any adverse effect due to a high UV dosage. The eyes were protected in both the groups by using UV protective goggles. Patients in the study group were given an initial dose of 4 Jcm² x SPF of the fabric. An increment of 0.5 Jcm² was used in both the groups.

Treatment was given four times per week. All patients received a maximum of 12 PUVA treatments; however if they showed complete or near complete improvement before completion of 12 treatments their treatment was discontinued. Patients were allowed to use liquid paraffin and/or antihistamines during the study.

Assessment
Patients were assessed on entry and then at weekly intervals till the end of the study using the PASI scoring system and global score index. Statistical analysis was done by t-test for paired data with the two groups, selecting the PASI score at weekly intervals as variables. T-test was also done separately for global score index using weekly analysis by the patient as the variables. The improvement was graded as follows: complete remission: more than 90% reduction in the PASI score; partial remission: 50-90% (average 65%) reduction in the PASI score; and treatment failure: less than 50% reduction in the PASI score.
RESULTS

The intensity of light in the Waldmann’s phototherapy unit was 10 milliwatts/cm² and after covering the sensor with the chosen cloth the output decreased to 3 milliwatts/cm², implying that the UV transmissibility of the cloth was 30%. Since the sun protective factor of a fabric is $1/T$, the SPF of the cloth = $1/30\%$, i.e. 100/30, which is 3.33. Therefore the UV dosage in the study group was increased by 3.33 times to neutralize the blockage caused by the cloth.

Of the 14 patients in the study group, 10 showed complete remission (6 after 10 PUVA treatments and 4 after 12 treatments), and 4 showed partial improvement (Table 1). The PASI score decreased from a median of 24.7 (range, 17.1-43.0) to 2.1 (range, 1.5-9.1) (Table 2). The global score index of the patients increased from 0 at the beginning of treatment to a median of 3 at the end of treatment, indicating that the patients were very satisfied with the treatment ($p < 0.005$) (Table 3).

Of the 7 patients in the control group, 5 showed complete remission (Table 1, 3) after 10 PUVA treatments and 2 after 12 treatments. The median PASI score decreased from 25.30 to 3.30 (Table 2). The global score index of the patients increased from 0 at the beginning of treatment to a median of 3 at the end of treatment (Table 3).

There was no significant difference between the PASI score of the two groups both initially and the end of the treatment period (Table 4). This indicated that the severity of disease was well matched between the two groups before starting the study and that both the treatments were equally effective.

DISCUSSION

We evaluated a new method of administering PUVA...
therapy, by clothing patients in a thin, cream colored, plain woven, light weight cotton fabric (which offers high UV transmissibility and little transparency) and increasing the UV dose in proportion to the sun protective factor of the fabric (so as to neutralize the blockage in UV dosage caused by the fabric). In our single blind, randomized, comparative trial, one group received PUVA wearing the fabric and the other without it. We found both treatments to be equally effective when the UV dose in patients wearing the fabric was increased proportional to the sun protective factor of the fabric.

As patients with psoriasis require repeated PUVA therapy and the cumulative UV dose is the most important limiting factor, this form of therapy may concern a few people. But as we had covered the entire body with a cloth gown and protected the uncovered areas with a sunscreen, the cumulative UVA dose was comparable to treatment without the gown.

Thus we conclude that PUVA therapy can be given to patients wearing a fabric provided that the UV dosage is increased proportional to the sun protective factor of the fabric and the cloth uncovered areas protected with a sunscreen. Our findings can be extrapolated for PUVASOL therapy where sunlight is the source of UV rays, but since the UV dose is directly proportional to the time of exposure here, the exposure time should be increased proportional to the SPF of the fabric to achieve the desired results.

We recommend that patients wear a plain woven, cream-colored lightweight cotton gown during sun exposure (2 x 2 cotton blouse cloth) for PUVASOL therapy and the time of exposure be increased by 3.33 times.

REFERENCES