Original Article

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COMPARATIVE EFFICACY OF TWICE WEEKLY VERSUS THRICE WEEKLY NARROW BAND UVB PHOTOTHERAPY IN THE TREATMENT OF CHRONIC PLAQUE PSORIASIS

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ABSTRACT

Objectives: To compare the efficacy of twice weekly and thrice weekly narrow band UVB phototherapy in terms of Psoriasis Area Severity Index (PASI) scoring in patients with Chronic Plaque Psoriasis (CPP) having skin type III – V.

Methods: It was an experimental study (Randomized controlled trial of 84 patients, divided into two groups comprising 42 patients each). Phototherapy was administered thrice weekly (Monday Wednesday and Thursday) for group I and twice weekly (Tuesday and Saturday) for group II.

Results: Chi-square test was applied for efficacy against number of treatments per week and revealed a *p* value of less than 0.05 i.e statistically increase in efficacy for the thrice weekly group. Hence it was proven that thrice weekly Narrow Band (NB) UVB more effective than thrice weekly therapy for chronic plaque psoriasis.

Conclusion: Narrow band UVB is a safe and effective treatment modality in CPP. Thrice weekly NB UVB is more effective than twice weekly therapy in Asian skin phototype III-V.

Keywords: Psoriasis, Narrow Band UVB [NB UVB].

INTRODUCTION

Psoriasis is a common, genetically determined, immune mediated, inflammatory and proliferative disease of skin, the most characteristic lesions consisting of chronic, sharply demarcated, dull red, scaly plaques particularly on the extensor prominences and in the scalp.

Conventional phototherapy with broadband UV-B and photochemotherapy (psoralen–UV-A [PUVA]) are very efficient and widely used treatment modalities for psoriasis. The choice of treatment depends on the type and severity of psoriasis, the patient's age and general health, and the consideration of treatment-associated long-term risks. Comparative studies have shown that PUVA is therapeutically more effective than broadband UV-B radiation[4]. Conversely, treatment with UV-B is much easier to perform, requires less precautions to prevent acute adverse reactions, and seems to harbour a considerably lower carcinogenic potential than PUVA[5]. Based on these differences, broadband UV-B phototherapy is primarily indicated in patients with mild to moderate psoriasis, whereas for severe forms of psoriasis, PUVA is indicated.

This rough distinction between the use of phototherapy and PUVA for psoriasis had to be reevaluated when in the early 1980s a fluorescent lamp emitting narrowband UV-B between 311 and 313 nm (referred to as the TL-01 lamp) was developed by Philips to improve the efficacy of phototherapy[6]. The rationale for manufacturing such a lamp was derived from action spectra studies for the phototherapy of psoriasis in which longer wavelengths in the UV-B region were indicated to have the best ratio of antipsoriatic to erythemogenic activity[7]. Several authors subsequently investigated the therapeutic effectiveness of narrowband UV-B by either comparing the treatment results for the new lamp with those from previous trials using broadband UV-B[8] or by means of bilateral comparison studies[9]. These investigations confirmed the efficacy of narrowband UV-B treatment and showed that it provides for faster clearing, less burning reactions, and longer periods of remission[8] than conventional broadband UV-B phototherapy. This study was performed to compare efficacy of twice vs thrice weekly NB UVB in chronic plaque psoriasis; since major work on the use of selective UVB phototherapy has been done on skin types I- III therefore this study was designed to target patients with CPP having skin types III-V. No

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such study has been carried out in Pakistan to the best of our knowledge, therefore it's the first of its kind. This study also sought to elucidate the efficacy, frequency, incremental dose requirements, MED (minimum erythema dose) and side effect profile of NB UVB in CPP (in Asian skin).

MATERIALS AND METHODS

This study was carried out in the Department of Dermatology, Military Hospital Rawalpindi. Duration of study was six months. Non probability purposive sampling was adopted for sampling.

The patients between 10-60 years of age of either sex, chronic plaque psoriasis, patients having PASI score of 10 or more, patients who had not used any specific anti-psoriatic treatment for 2 weeks or phototherapy for 4 months before enrollment in the study were included in the study. While patiens having renal, hepatic or cardiac disease, photosensitivity, previous failure or intolerance to phototherapy, patients with ophthalmological disease were not included in the study.

Data Collection Procedure:

After an informed consent, 84 patients of either sex fulfilling the inclusion and exclusion criteria were enrolled in the study. Informed consent from patients recruited in the study and approval from the hospital ethical committee was sought. Patient's personal information was kept confidential. Detailed history and complete clinical examination was carried out. The diagnosis of plaque psoriasis was based on clinical diagnosis by a dermatologist, further confirmed by skin biopsy in doubtful cases.

Chronic was defined as a history of psoriasis recurring or present, for at least 1 year. Those on immunosuppressive therapy or with a history of skin cancer were excluded, as were those who had been treated with UVB, psoralen plus UVA (PUVA) or systemic psoriasis therapies within the past 4 months.

The patients were divided into two groups (I & II). Randomization was done by lottery method. Phototherapy was administered thrice weekly (Monday Wednesday and Thursday) for group I and twice weekly (Tuesday and Saturday) for group II. The total duration of the therapy was three months (12 weeks) i.e. 36 sessions for group I and 24 sessions for group II respectively. Phototherapy was done with Waldmann UV 100L featuring a total of 08 UV B Lamps of Waldmann type F85/100W-01. These lamps have radiation spectrum ranging between 310nm to 315nm. MED was calculated for each and every patient by irradiating the upper back with successively higher doses of nb uvb. The dose (mJ/cm^2) that caused just perceptible erythema 24 hours after irradiation was designated as MED.

Phototherapy was started at 70% of MED. A 20% increment in UV dose was made on each visit. Later on in the study, due to the increasing exposure doses, increment was reduced to 10% of the previous dose; in order to reduce the side effect profile. Genital protection was advised in all cases. The results were assessed using PASI scores which were calculated at the start of the therapy (day 0) and end of therapy (12 weeks). Efficacy was defined as percentage regression in PASI score in an individual patient [2]. This was labeled as very good (70% or more) good (50-69%) satisfactory (30-49%) and poor (less than 30%).

The grade of erythema, pigmentation, pruritis, polymorphic light eruption and any other side effects was recorded on each visit. Erythema was recorded as grade 1 (ill-defined, asymptomatic determined on the basis of patient description), grade 2 (well-demarcated, not painful, often still evident when patient returns for review), grade 3 (painful) and grade 4 (blistering). Patients were allowed to use bland emollients in case of pruritis and were prescribed steroid lotions in case of scalp involvement.

Data Analysis:

Data analysis was performed using SPSS version 10. Mean and standard deviation were calculated for numerical variables i.e. age and duration of psoriasis. Frequency and percentages were presented for all categorical variables i.e. gender and PASI score (Very Good, Good, Satisfactory, Poor), and the data was presented in tabular and graphic forms.

Chi-square test was applied to compare the PASI score in twice and thrice weekly narrow band UVB patients at 0 and 12 weeks. A *p*-value less than 0.05 was considered statistically significant.

RESULTS

In total, 84 patients were recruited out of which 79 completed the study: 68 men and 11 women, skin phototypes III-V, median age 34 years (range 10-60). Five patients were unable to complete the study; one lady got pregnant and favoured topical therapy thereafter. Out of the four male patients' two shifted elsewhere, one developed painful erythema (grade III) and became unwilling for further therapy and one patient developed pustular psoriasis had to be admitted and was subsequently placed on methotrexate. Out of the remaining 79 patients thirty nine were randomized to receive thrice weekly therapy (group I) and forty to twice weekly therapy (group II). The mean duration of CPP was calculated to be 3.38 years in all the 79 patients. Minimum Erytheme Dose (MED) was calculated for each patient. Efficacy, which signified percentage regression in PASI score was found to be very good (70% or more) in 65 patients (39 from group I and 26 from group II) good (69-50%) in 12 (all from group II), satisfactory (49-30%) in 2 patients (group II) and poor in none of the patients. It is therefore obvious that efficacy was much more in group I, where all the patients cleared more than 70% with thrice weekly therapy (Table-1). Generally the side effect profile was low; few patients developed mild pruritis responsive to emollients. Twenty one patients developed grade I erythema which settled on its own while 4 developed grade II erythema, missed one subsequent exposure, and their UVB dose had to be reduced to the previous dose. One patient developed grade III erythema and dropped out of study. None of the patients developed polymorphous light eruption or grade IV (blistering) erythema.

Analysis: Chi-square test was applied for efficacy against number of treatments per week and revealed a *p* value of less 0.05 i.e statistically significant increase in efficacy for thrice weekly group. Hence it was proven that thrice weekly NB UVB is more effective than twice weekly therapy for (Figure).

DISCUSSION

Psoriasis is a common, genetically determined immune mediated inflammatory and proliferative disease of the skin, the most characteristic lesion consisting of chronic, sharply demarcated, dull red, scaly plaques particularly on the extensor prominences and on the scalp.

Phototherapy is a well recognized treatment modality for chronic plaque psoriasis (CPP). Narrowband (NB) UVB phototherapy has been proven to be clearly more effective

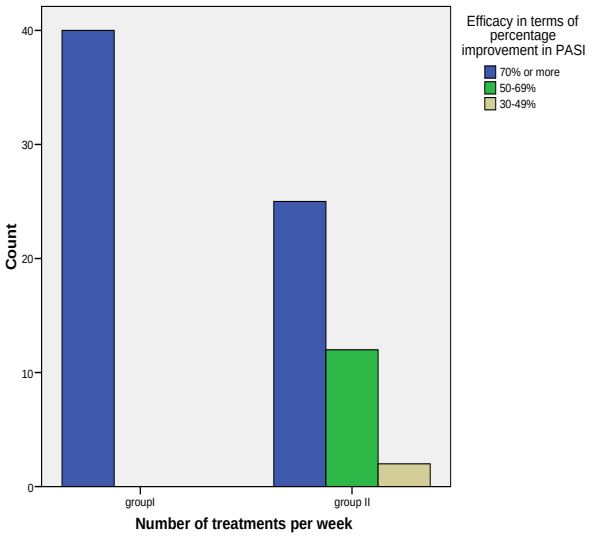

Figure: Graphical representation of Efficacy (which signifies percentage regression in PASI score) in both the treatment groups.
Group I: thrice weekly NB UVB
Group II: twice weekly NB UVB

Table: Number of treatment per week "Efficacy in terms of percentage improvement in PASI" cross tabulation.

	Efficacy in term of percentage improvement in PASI			Total
Number of treatments per week	**30-49 %**	**50-69%**	**70% or more**	
2 (Group II)	2	12	26	40
3 (GroupI)	0	0	39	39
Total	**2**	**12**	**65**	**79**

than broadband UVB and safer and/or more practicable than psoralen-UVA in the management of psoriasis[1]. For more than a decade now, narrowband UV-B phototherapy emitting light in the 311-313 nm spectra has been used successfully for the treatment of psoriasis. This is associated with more effective clearing of psoriasis compared with conventional broadband UV-B[2].

Phototherapies are generally hospital based treatment for which patients need to attend specialized dermatology units[10]. The published literature in this modality of treatment indicates that at least three sessions per week are mandatory to have optimum therapeutic effect[2]. Since major work on the use of selective UVB phototherapy has been done on skin types I-III, therefore this study is designed to compare the efficacy of thrice weekly versus twice weekly therapy with NBUVB in patients with CPP having skin types III-V. The standard NBUBV regimen for psoriasis involves a starting dose based on a percentage of the individual patient's MED, followed by three times weekly therapy adhering to a low incremental dosage regimen. Avoiding problems, such as uncomfortable erythema episodes, can occur if treatment regimens are applied too inflexibly. It is therefore worth emphasizing that the low (20% reducing to 10%) incremental dose regimen was adjusted to take into consideration each individual patients' erythemal response. Our study has clearly proven that thrice weekly narrow band UVB is more effective in clearing psoriasis as compared to twice weekly therapy.

Recently, Vichit *et al* compared phototherapy two times and four times a week with low doses of NBUVB in 69 Asian patients with psoriasis[12]. No significant difference was found between the two regimens in the PASI score at the end of treatment, in the proportion of patients whose skin cleared during treatment and in the time to clearance (8 weeks).

In 2005, Bari *et al* evaluated the efficacy of UVB and PUVA therapy in moderate plaque psoriasis[10]. Fifty patients were randomly divided in two equal groups and given 12, thrice weekly sessions of PUVA and UVB respectively. Both PUVA and UVB phototherapy were found effective in moderate plaque psoriasis (p>0.05). However, the authors recommended that, UVB phototherapy having lesser short term adverse reactions, should be the first choice phototherapy (where facilities exist)

Tahir and Mujtaba compared PUVA with NB UVB. Forty patients with chronic plaque type psoriasis were included in the study[13], divided into two equal groups. It was concluded that when given thrice weekly, PUVA was more effective treatment for psoriasis than narrowband UVB phototherapy.

The results of our study are consistent with those of Cameron *et al*[14] who proved that three times weekly NB-UVB cleared pasoriasis significantly faster than twice weekly treatment, and therefore was preferable for most patients. However, their study population consisted of patients with skin phototype I-III.

A relatively small sample size, absence of double-blinded approach and lack of long term follow up are the limitations of our study.

However, to the best of our knowledge, this is the first study where NB UVB therapy has been evaluated in terms of efficacy, frequency, incremental dose requirements, MED and side effect profile in Pakistan. Further studies are required especially to elucidate the long term side effects including UV-induced skin cancer in these patients[15].

CONCLUSION

Narrow band UVB is a safe and effective treatment modality in CPP. Moreover it has the advantage of being used as home therapy. Thrice weekly NB UVB is more effective than twice weekly therapy in Asian skin phototype III-V as well. However, regarding its higher cumulative doses a more meticulous long term follow up is required in order to assess risk of skin cancer in these patients.

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