

# Efficacy and Safety of Narrow Band UVB in the Treatment of Chronic Plaque Psoriasis

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**Background:** Narrow band UVB (TL-01 lamp) has been proved more successful than broad band UVB in the treatment of chronic plaque psoriasis. It is equally effective but more safe than that of psoralen ultraviolet A (PUVA).

**Study Design:** Interventional study.

**Aims and Objectives:** To evaluate the success rate and safety of narrowband UVB in chronic plaque psoriasis in type IV skin.

**Material and methods:** It is an ongoing study of 60 patients. Till date, twenty patients aged between 8-70 years have completed the study. According to the skin type IV, the starting dose was 330 mJ/ cm<sup>2</sup>. All patients were exposed to whole body narrowband UVB chamber thrice a week until clearance or upto maximum of 24 sessions. Patients were assessed according to the PASI (Psoriatic Area and Severity Index) score at the baseline and then at 4<sup>th</sup> and 8<sup>th</sup> week of therapy.

**Results:** Out of a 20 patients, those who have completed the study till date, 18 have been cleared while two cases showed a poor response. None of our patients developed any adverse effect.

**Conclusion:** Narrowband UVB is a safe and effective therapy for chronic plaque psoriasis but long term follow up is needed to determine its carcinogenic effects.

**Key words:** Psoriasis, narrowband UVB, PASI.

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## Introduction

Psoriasis is a common, chronic, disfiguring, inflammatory and proliferative disease of the skin, also affecting nail and joints in which both genetic and environmental factors play a key role. The most characteristic lesion on the skin consist of erythematous, scaly, well defined, indurated plaques, present mainly over extensor surfaces and scalp.<sup>1</sup> It affects 2% of the world's population with 30% patients suffering from psoriasis having a first-degree relative suffering from this disease.<sup>2</sup> Phototherapy, photochemotherapy and systemic immunosuppressive agents are good therapeutic options for chronic plaque psoriasis resistant to topical emollients and keratolytics.<sup>3</sup> In the last few years, the development of phototherapy devices with new emission spectra has led to a widespread role of radiation in the treatment of various skin diseases<sup>4</sup>. Phototherapy can be administered as broadband UVB, narrowband UVB, Excimer laser, UVA1, psoralen-UVA and photodynamic therapy for chronic plaque psoriasis.<sup>5</sup> The use of narrowband UVB offers major advantage over PUVA owing to the fact that it does not depend on the concomitant administration of a photosensitizers.<sup>6</sup> Patients treated with narrow band UVB show faster clearance of skin lesions and longer duration of remission because it depletes skin infiltrating T cells from the epidermis and dermis of psoriatic plaques more efficiently than that of broad band UVB.<sup>7</sup>

Narrow band UVB (TL-01 lamp) has been proved more successful than broad band UVB (BB UVB) in the treat-

ment of chronic plaque psoriasis. It is equally effective but more safe than that of psoralen ultraviolet A (PUVA).<sup>8,9</sup>

The present study is designed to evaluate the success rate and safety of narrowband UVB in chronic plaque psoriasis in type IV skin.

## Material and Methods

This is a purposive non-probability ongoing study of 60 patients started in December 2009 at the department of dermatology unit II, Mayo Hospital, Lahore. Patients of either sex between 8 to 70 years of age, having a PASI score (table 1) of at least 10, were included in the study.

- (a) Divide the body into four areas: head, arms, trunk to groin, and legs to top of buttocks.
- (b) Generate an average score for the erythema, thickness and scale for each of these areas on a 0-4 scale:  
0 : None  
1 : Slight  
2 : Mild  
3 : Moderate  
4 : Severe
- (c) Sum scores of erythema, thickness and scale for each area.
- (d) Generate a percentage for skin covered with psoriasis for each area and convert that to a 0-6 scale according to following criteria:  
0 : 0 (clear)  
1 : < 10%

2	: 10 - < 30%	(10 – 29%)
3	: 30 - < 50%	(30 – 49%)
4	: 50 - < 70%	(50 – 69%)
5	: 70 - < 90%	(70 – 89%)
6	: 90 - < 100%	(90 – 100%)

(e) Multiply score of item (c) and item (d) above for each site and multiply that by area multiplier (0.1,0.2,0.3,and 0.4 for head, arms, trunk, and legs, respectively).

Add these score to get the PASI score.

Exclusion criteria included previous skin malignancy, phototherapy in the preceding 3 months or more than 150 sessions in the patient's lifetime, administration of a drug known to frequently cause photosensitization, topical anti-psoriatic treatment in the previous 4 weeks or systemic anti-psoriatic therapy in the previous 3 months.

Diagnosis was made on the basis of history and relevant clinical examination. After taking informed consent, patients were exposed to whole body narrowband UVB radiation chamber, consist of 24 Philips 100 – W fluorescent tubes emitting radiation of a wavelength 311 – 313 nm thrice a week. The narrowband UV-B radiation in its chamber at the surface of the patient's skin was 7 mW/ cm.<sup>2</sup> The radiation intensity was measured monthly. The dose was given according to skin type. Starting dose in all the patients was 240 mj/cm<sup>2</sup> (skin type IV). The dose increment was 15% of starting dose on subsequent visits till the disappearance of lesions which was defined by reduction in PASI score to 3 or less. During the exposure, eyes and genitals were protected by goggles and plastic shields. Treatment was stopped after 24 exposure.

## Results

Out of 20 patients who have completed this study till date, 18 showed remarkable improvement. Only 2 patients did not show significant improvement in their disease. No side effects were seen in our patients up till now.

**Table 1: Results.**

No. of patients	20
Cleared	18
Average No. of treatments required	20
Mean initial dose, J/ cm <sup>2</sup>	0.24
Mean final dose, J/ cm <sup>2</sup>	1.7
Mean cumulative dose required for clearance (J /cm <sup>2</sup> )	34
Mean PASI score at baseline	19.9
Final mean PASI score	3

## Discussion

The development of TL-01 lamp with a higher therapeutic potential than conventional broadband UVB sources as well

as the increasing awareness of carcinogenic risk associated with PUVA therapy have led to continuously increasing use of narrowband UVB (NB-UVB) phototherapy in psoriasis<sup>8</sup>. Expression of psoriatic skin lesions is considered to be due to inflammation of the skin accompanied by hyperproliferation of keratinocytes and dermal infiltration by lymphocytes consisting mainly of helper T- cells (CD4+) and cytotoxic T-cells (CD8+).

UVB affect the synthesis of proteins and nucleic acid which decreases the proliferation of epidermal keratinocytes. It also down regulate the number of Langerhan's cells, thus preventing the capacity of dendritic cell to present an antigen because of the damaged to the cell membrane and thus reduces the expression molecules present on the surface and also changes the secretion of cytokines in the macrophages. It also decreases subset of T-cells, Th 17 cell, which is the cell, playing a key role in the immunopathogenesis of psoriasis.<sup>10</sup> The results of our study showed 90% success rate in 20 patients with a mean cumulative dose of 34 J/cm<sup>2</sup> in 20 treatment sessions. Various studies have revealed that efficacy of PUVA and NB UVB in patients with chronic plaque psoriasis is comparable<sup>11</sup>. Similar results were seen in studies carried out in our department using PUVA and PUVB in patients of chronic plaque psoriasis in previous years.<sup>12</sup> However, side effects have been seen with ultraviolet therapies using psoralens.<sup>11,12</sup> Narrowband UVB therapy in chronic plaque psoriasis has been proved more effective than that of broad band UVB (BB UVB) in many studies conducted in the past.<sup>13</sup>

A study carried out by Green C *et al* concluded that patients who were treated with NBUVB had better remission rates than that of those who were exposed to BB UVB.<sup>14</sup>

Shams *et al* also showed comparable success rate of NB UVB with our study in chronic plaque psoriasis (type IV skin) but their patients required more mean cumulative dose than that of our patients.<sup>15</sup> It might be due to difference in the number of lamps within the chamber. Our cabin contained 24 lamps compare to 8 used in Shams *et al* study.

Hearn *et al* recently reviewed 3867 patients, in whom the median number of sessions was 29 and 352 patients had received more than 100 sessions. During mean follow up period of 5.5 years, insignificant association has been found with basal cell carcinoma, squamous cell carcinoma or melanoma.<sup>16</sup>

Till date, only 20 of our patients have completed the study. We did not see any short or long term undesirable effect with NBUVB. We need a larger sample for conclusive evidence of efficacy and safety with NBUVB.

## Conclusion

Narrowband UVB is a safe and effective therapy for chronic plaque psoriasis but long term follow up is needed to determine its carcinogenic effects.

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