

Research Article

Efficacy of targeted narrowband ultraviolet B therapy in vitiligo: a prospective study

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ABSTRACT

Background: Vitiligo is an acquired disorder of skin pigmentation that is associated with tremendous psychological impact on the affected patients. Narrow-band ultraviolet B (NB-UVB) is an emerging, effective and safe therapy for vitiligo. The objective of the study was to know the efficacy and safety of NB-UVB therapy in 31 vitiligo patients of various age groups.

Methods: This was a prospective and non-randomised study carried out in GMERS Medical College, Gandhinagar, Gujarat during the period of 1st January 2011 to 30th June, 2014. This study was conducted in 31 patients of “stable” vitiligo involving less than 5% body surface area (BSA) after taking verbal and written consent of the patients. Study was done on OPD bases by giving targeted NB-UVB lamp to various age groups of vitiligo patients along with topical mometasone cream at various stage of disease. This all patients were followed up at monthly interval. The repigmentation response was correlated with the duration of the disease, site of the involved lesion and age of the patient. Chi-square test was used for assessing the statistical significance of the results obtained and a $p < 0.05$ was considered as “statistically significant.”

Results: Most of the patients (29/31) enrolled for the study was suffering from “vitiligo vulgaris” and only 2 patients had segmental/focal type of vitiligo in the study group. Duration of vitiligo ranged from 1 year to 16 years with a mean of 4.19 years. The age of the enrolled patients ranged from 13 years to 48 years with a mean of 26.5 years. Complete repigmentation was achieved in 10 patients while 14 patients showed moderate to good improvement. Out of 23 lesions on face and neck, 12 (52.1%) showed 90-100% repigmentation. Out of 18 lesions on trunk, 8 (44.4%) showed 90-100% repigmentation. Out of 14 lesions upper limb, 7 (50%) lesions showed 90-100% repigmentation.

Conclusions: NB-UVB therapy is an effective and safe modality to treat vitiligo of all age groups with cosmetically acceptable repigmentation. Age of the patients or duration of vitiligo was seen to have minimal effect on the repigmentation response.

Keywords: Vitiligo, NB-UVB, Repigmentation, Vitiligo vulgaris, Acral vitiligo

INTRODUCTION

Vitiligo is an acquired disorder of skin pigmentation that is associated with tremendous psychological impact on the affected patients. Vitiligo still remains a difficult disease to treat, although various non-surgical and surgical treatment modalities have been mentioned in the literature.¹⁻³ For the decade, conventional oral psoralene along with UVA (ultraviolet A) were used for the

treatment of vitiligo (PUVA therapy).^{4,5} Its limitations include acute side effects such as nausea and phototoxic reactions and long-term effects such as cataracts and carcinogenesis. Topical & systemic steroids were the other modalities of treatment in progressive vitiligo. Narrow-band ultraviolet B (NB-UVB) therapy came in lime light since 4 to 5 years in India for the treatment of vitiligo. Narrow-band ultraviolet B (NB-UVB) is an emerging, effective and safe therapy for vitiligo.⁵⁻⁷ It is as

effective as PUVA, without side effects.^{8,9} In 1997, Westerhof and Nieuweboer- Krobotova were the first to study the effect of NBUVB in vitiligo.¹⁰ NBUVB therapy has also been reported to be safe in childhood vitiligo.¹¹

Targeted phototherapy is the term used when the phototherapeutic device specifically “targets” the lesional skin through special delivery mechanisms while the rest of the skin remains unexposed. An important advantage of this type of phototherapy is that the uninvolved skin remains protected and thus higher energies can be used to achieve a rapid therapeutic effect.^{12,13} In addition, the treatment can be administered only twice a week or even once a week and each treatment session lasts for seconds only. Therapeutic results obtained are also claimed to be better as there is less contrast between lesional and perilesional skin and the cumulative adverse effects of the whole body irradiation are also avoided.

The clinical experience with targeted NBUVB in vitiligo is limited, with very few reports published in the literature so far. Earlier reported studies were mostly in the western population and its experience in the darker race, including Indians, is limited.^{14,15} In view of the paucity of experience with targeted NBUVB, this study has been undertaken to evaluate the response pattern of targeted NBUVB therapy

METHODS

This was a prospective and non-randomised study carried out in GMERS Medical College, Gandhinagar, Gujarat during the period of 1st January 2011 to 30th June, 2014. This study was conducted in 31 patients of “stable” vitiligo involving less than 5% body surface area (BSA) after taking verbal and written consent of the patients. Study was done on OPD bases by giving targeted NB UVB lamp to various age groups of vitiligo patients along with topical mometasone cream at various stage of disease. This all patients were followed up at monthly interval. For the purpose of the present study “stable vitiligo” was defined as “vitiligo showing no further spread or spontaneous repigmentation over a 3 month period.” Patients who were on any topical treatments were given a washout period of 3 weeks before enrolment into the study. Patients who had received any other form of phototherapy, patients with photosensitive disorders and patients on any immunosuppressant or immunomodulator drugs for vitiligo were excluded from the study. In addition, pregnant patients and patients with acrofacial vitiligo were also excluded. Before conducting the study approval was obtained from institutional ethical committee for human research. Data safety and confidentiality was also given due consideration. The file containing identity related details was kept password protected and the filled Performa were kept in lock with key accessible only to researcher. A complete general and systemic examination was carried out to know the associated systemic diseases. A thorough dermatological examination was carried out. Relevant hematological and

biochemical investigations were carried out in all the patients. A total of 31 patients of vitiligo were treated with a targeted NBUVB device twice weekly for a maximum of 30 sessions or until 100% repigmentation, whichever was reached first. The extent of repigmentation achieved was assessed and adverse effects, if any, were also noted down. The repigmentation response was correlated with the duration of the disease, site of the involved lesion and age of the patient. Chisquare test was used for assessing the statistical significance of the results obtained and a $p < 0.05$ was considered as “statistically significant.”

RESULTS

Most of the patients (29 /31) enrolled for the study was suffering from “vitiligo vulgaris” and only 2 patients had segmental/focal type of vitiligo in the study group. Duration of vitiligo ranged from 1 year to 16 years with a mean of 4.19 years.

The age of the enrolled patients ranged from 13 years to 48 years with a mean of 26.5 years. Majority of the patients in the study belonged to the 2 and 3 decade of life (Table 1).

Table 1: Distribution of the patients according to age group and repigmentation of lesions.

Age	Number of patients	Number of lesions treated	90-100% repigm-entation	50-75% repigm-entation
<18 years	11	25	12	9
18-40 years	12	28	13	8
>40 years	8	16	8	5
Total	31	69	33	22

Complete repigmentation was achieved in 10 patients while 14 patients showed moderate to good improvement (Table 2).

Table 2: Distribution of the patients according to their repigmentation after therapy.

Total patients given NB UVB handy lamp therapy	Compl-ete Repigm-entation	Stoppage of disease activity & moderate to good improvement	No Benefit
31	10	14	07

Out of 23 lesions on face and neck, 12 (52.1%) showed 90-100% repigmentation. Out of 18 lesions on trunk, 8 (44.4%) showed 90-100% repigmentation. Out of 14

lesions upper limb, 7 (50%) lesions showed 90-100% repigmentation (Table 3).

Table 3: Distribution of the patients according to their site of the lesions and repigmentation.

Site of lesions	Number of lesions	90-100% repigm-entation	50-75% repigm-entation	<50% repigm-entation
Face and neck	23	12	7	5
Trunk	18	8	6	4
Upper limbs	14	7	5	3
Lower limbs	14	6	4	2
Total	69	33	22	14

These results were tested for their statistical significance by using Chisquare test and the difference in repigmentation between different sites of the body was found to be not statistically significant (Chi square value of 0.2829 and P <0.99).

DISCUSSION

Targeted NB UVB Lamp therapy is one of the good methods for treatment of vitiligo patients.

As this therapy can be done at home and only monthly follow up to be done at clinic, we found good compliance of the patients. No oral medications were given. As early we start this therapy in course of disease vitiligo better the results.

In 14 patients partial improvement found, reason may be irregular treatment; patients may have taken or may not have taken UVB therapy as explained to them up to minimal erythema dose.

No benefit found in extensive vitiligo and/or acral vitiligo because energy emitted by targeted NB UVB lamp may be insufficient to stimulate to stimulate/activate melanocytes and it is difficult for patients to cover all areas of the body with targeted NB UVB Lamp.

In this particular study, lesser number of exposures was required to achieve 25.75% repigmentation. Similarly, the cumulative dose was also lesser to achieve the same repigmentation, whereas Njoo et al. reported the same repigmentation with more number of exposures (76.3 ± 16.7).¹¹ The same observations were reported in other western studies.^{6,8,11,14,15} Our study and other Indian studies showed that dark skin (Fitzpatrick type IV and V) requires lesser number of exposures and cumulative dose to achieve 25.75% repigmentation when compared with white skin (Fitzpatrick I and II).^{7,12,13}

It has also been observed in our study that with good adherence to therapy and compliance, faster and good response can be achieved. It has been proved statistically that good response is directly associated with more number of exposures, cumulative dose and good compliance. In our study also certain anatomical sites like face, neck, trunk and back responded faster, with better repigmentation to NB UVB therapy, and poor response was observed over the acral areas. The repigmentation achieved in all the cases was cosmetically accepted and matched with the surrounding normal skin, unlike in PUVA therapy. In this way, NB UVB therapy is superior to oral PUVA therapy.

Lahiri et al found that NB UVB therapy was a useful tool in inducing repigmentation after regrafting in punch-grafting failure cases.¹⁷ The same authors also reported successful repigmentation of lip vitiligo with punch grafting combined with NB UVB therapy.¹⁸

No major side/adverse effect were observed in any patients except redness /erythema/ swelling were found in 6 patients because patients may have taken more light than minimal erythema dose as explained to them therapy discontinued in this patients for a week when they develop side effects and again started after one week gap. The adverse effect profile observed in our study was similar to that reported in the literature.^{4-8,11,15} All these studies, including ours, clearly establish the safety profile of NB UVB therapy.

CONCLUSIONS

NB UVB therapy is an effective and safe modality to treat vitiligo of all age groups with cosmetically acceptable repigmentation. Age of the patients or duration of vitiligo was seen to have minimal effect on the repigmentation response.

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