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ORIGINAL ARTICLE

Efficacy of Narrowband Ultraviolet B Therapy for Management of Patients Presenting with Hand Vitiligo

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ABSTRACT

Aim: To assess the efficacy of Narrowband Ultraviolet B therapy for management of patients presenting with hand vitiligo.
Study design: Descriptive case series.
Place and duration of study: Department of Dermatology Unit-II, Mayo Hospital, Lahore from 15-03-2018 to 5-09-2018.
Methodology: This descriptive case series study was done at Mayo Hospital, Lahore from 15-03-2021 to 05-09-2018. A total of 355 patients were included in this study from 16-60 years of age either gender.
Results: The mean age was 37.79±12.66 years from 16 to 60 years. There were 176(49.6%) male and 179(50.4%) female cases. According to operational definition, 25(70.4%) cases achieved efficacy of treatment.
Conclusion: It is concluded that efficacy of Narrowband Ultraviolet B therapy for the management of patients presenting with hand vitiligo is 70.4%. So, using this treatment method we can improve patient quality of life and can reduce the psychological squeal.
Keywords: Vitiligo, Phototherapy, Treatment, Targeted Narrowband Ultraviolet B Phototherapy, Efficacy.

INTRODUCTION

Vitiligo is an acquired disorder of depigmentation characterized by loss of melanocytes from epidermis. About 0.1-4% of the world's population is affected by vitiligo.[1] It may lead to severe psychological trauma especially when it involves hands, feet and face.[2] Hypotheses regarding aetiopathogenesis of vitiligo include autoimmune processes, cytotoxic effects, oxidative stresses and neurohumoral mechanisms[1]. To assess the severity and response to treatment, different scoring systems are used such as visual assessment, vitligo area scoring index (VASI), digital planimetry, etc[3].

Treatment options for vitiligo are topical steroids, calcineurin inhibitors, ultraviolet light therapies and surgery.[4] Among the many treatment modalities, ultraviolet light based therapies are most effective and include photochemotherapy (psoralens with ultraviolet A), phototherapy (narrowband and broadband ultraviolet B) and targeted phototherapy (excimer laser).[2] The mainstay of vitiligotreatment for a long time but due to side effects like nausea, phototoxic reactions and carcinogenesis, its use became limited.[5] In 1990, broadband ultraviolet B (BB-UVB) was introduced for vitiligo but could not achieve popularity due to lack of effectiveness. The adverse effects of phototherapy are minimal and do not necessitate treatment discontinuation as compared to other therapies[6]. One study showed 77.5% cases achieved efficacy (re-pigmentation ranging from 50% to 100%) treated with NB-UVB[7]. Another study revealed that NB-UVB was effective (≥50 re-pigmentation) in 25(64%) patients of vitilig.

Patients having vitiligo on hands are psychologically more affected as it draws attention of people in social and professional interactions. Vitiligo on hands is mostly recalcitrant.

To date, no study has been conducted in our country to determine the effect of NB-UVB on hand vitiligo. Internationally conducted studies are on small sample size. We conducted this study on a large sample size to get more authentic and reliable results.

PATIENTS AND METHODS

This study was consisted of 355 patients after permission from Institutional Ethical Review Board. An informed and written consent was obtained. On first visit, history was taken and clinical examination was done. The NB-UVB was generated by 100 watt T12 low pressure mercury vapor fluorescent lamp. The light emitted was in UV-B band with primary emission range of 310-315 nm. The UV-B irradiance in the cabin at the surface of patient's skin was between 7 and 8 mW/cm^2. Patients were treated twice weekly, 3 days apart, initially with an irradiation dose of 250 mJ/cm^2 followed by 50mJ/cm^2 increment at each visit until mild erythema or perifollicular pigmentation of the lesion occurred. The same dose was continued for the rest of sessions. Patients were followed up weekly for any evidence of regimentation both clinically as well as by repeated digital photographs. During each visit, side effects like erythema, itching and photosensitivity was noted. NB-UVB was continued for a maximum of 30 sessions or earlier if complete regimentation occurs. Patients was followed up monthly for two months after completion of the treatment and efficacy of treatment was labeled as per operational definition at 4th month[7,8]. Mean±SD for age and duration of vitiligo was calculated. Frequency and percentage was calculated for gender and efficacy. Data was stratified for age and gender, baseline extent of depigmentation, duration of symptoms to deal with effect modifiers. P-value ≤0.05 taken as significant.

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RESULTS

The mean age was 37.79±12.66 years (Table 1). There were 176(49.6%) male and 179(50.4%) female cases (Figure 1). The mean duration of disease was 7.96±4.01 years from 1-15 years (Table 2). According to operational definition, 25(70.4%) cases achieved efficacy of treatment (Figure 2). When data was stratified for age, in age group of 16-40 years and 41-60 years the frequency of efficacy was 138(71.1%) and 112(69.6%) respectively, the frequency of efficacy was statistically same in both age groups (p >0.05) (Table 3). When data was stratified for gender, in male and female cases the frequency of efficacy was 125(71%) and 125(69.8%) respectively the frequency of efficacy was statistically same in both gender (p >0.05) (Table 4). When data was stratified for duration of disease, in cases with duration of <5 years had efficacy as 78.8% and those who had duration of disease as 5-15 years had efficacy as 67.2%, the frequency of efficacy was statistically higher in cases with duration of disease as <5 years (p <0.05) (Table 5). When data was stratified for baseline extant of depigmentation, in 50-75% group 142(90.4%) and in >75% group 108(54.5%) cases had efficacy of treatment, the frequency of efficacy was statistically higher in cases with who had 50-75% baseline extant of depigmentation (p <0.05) (Table 6).

Table 1: Age distribution of patients (n=355)

	Age (years)
Mean	37.79
S.D	12.66
Minimum	16.00
Maximum	60.00
Range	44.00

Fig. 1: Gender distribution of cases

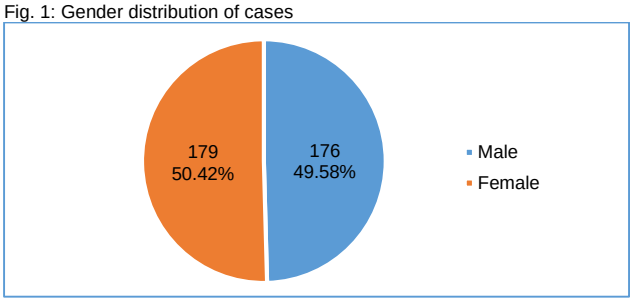

Table 2: Descriptive statistics of duration of disease

	Duration (years)
Mean	7.96
S.D	4.01
Minimum	1.00
Maximum	15.00
Range	14.00

Fig. 2: Distribution of efficacy of treatment hart

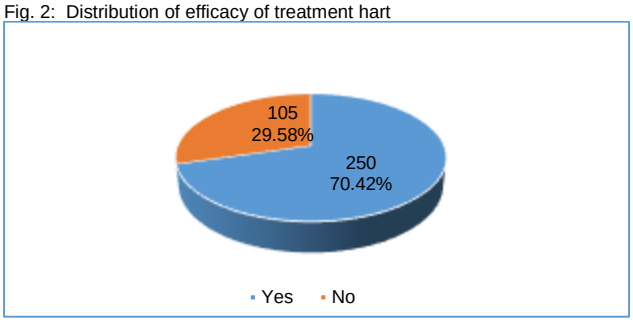

Table 3: Comparison of efficacy of treatment in both age groups

Age groups (years)	Efficacy		Total
	Yes	No	
16-40	138(71.1%)	56(28.9%)	194(100.0%)
41-60	112(69.6%)	49(30.4%)	161(100.0%)
Total	250(70.4%)	105(29.6%)	355(100.0%)

P=0.74

Table 4: Comparison of efficacy of treatment in both genders

Gender	Efficacy		Total
	Yes	No	
Male	125(71%)	51(29%)	176(100%)
Female	125(69.8%)	54(30.2%)	179(100%)
Total	250(70.4%)	105(29.6%)	355(100%)

P = 0.81

Table 5: Comparison of efficacy of treatment with respect to duration of disease

Duration	Efficacy		Total
	Yes	No	
< 5 years	78(78.8%)	21(21.2%)	99(100.0%)
5-15 years	172(67.2%)	84(32.8%)	256(100.0%)
Total	250(70.4%)	105(29.6%)	355(100.0%)

P = 0.032

Table 6: Comparison of efficacy of treatment with respect to baseline extant of depigmentation

Baseline extant of depigmentation	Efficacy		Total
	Yes	No	
50-75%	142(90.4%)	15(9.6%)	157(100.0%)
>75%	108(54.5%)	90(45.5%)	198(100.0%)
Total	250(70.4%)	105(29.6%)	355(100.0%)

P <0.001

DISCUSSION

Vitiligo is an acquired disorder of skin pigmentation. It remains a difficult disease to treat, various non-surgical and surgical treatment modalities[9]. For the decade, conventional oral psoralene along with UVA (ultraviolet A) were used for the treatment of vitiligo (PUVA therapy). Topical & systemic steroids were the other modalities of treatment in progressive vitiligo.[10] Narrowband ultraviolet B (NBUVB) therapy came in lime light since 4 to 5 years in India for the treatment of vitiligo. Narrowband ultraviolet B (NBUVB) is an emerging, effective and safe therapy for vitiligo[11]. It is as effective as PUVA, without side effects. NBUVB therapy has also been reported to be safe in childhood vitiligo[12].

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. The treatment can be administered only twice a week or even once a week and each treatment session lasts for second only[13]. Earlier reported studies were mostly in the western population and its experience in the darker race, including Indians, is limited[14].

The mean age was 37.79±12.66 years. There were 176(49.6%) male and 179(50.4%) female cases. One study was done with similar objective on cases having a mean age of 26.5 years[15]. In a study, there were 45% males and 55% females[16], we also that female were slightly more than male. In current study 25(70.4%) cases achieved efficacy of treatment. A study showed higher efficacy than our study i.e. 77.5% cases achieved efficacy (re-pigmentation ranging from 50% to 100%) treated with NB-UVB.[7] While another study revealed that NB-UVB was effective (≥ 50 re-pigmentation) in 64% patients of vitiligo (n=25)[8] this was less reported efficacy as we found. Another 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. The re-pigmentation response was correlated with the duration of the disease, site of the involved lesion and age of the patient. The result has showed that 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. Complete re-pigmentation 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% re-pigmentation. 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% re-pigmentation. Hence the study has concluded that NBUVB therapy is an effective and safe modality to treat vitiligo of all age groups with cosmetically acceptable re-pigmentation. Age of the patients or duration of vitiligo was seen to have minimal effect on the re-pigmentation response[15].

Batool et al reported the efficacy of narrowband ultraviolet B therapy with needling in patients of vitiligo. In each patient a patch of 15 to 5cm diameter skin area was selected as a target lesion. Needling was done on the whole patch with a disposable insulin syringe, from the pigmented margins or the islands in the vitiliginous patch. After the procedure, the whole patch was subjected to NBUVB. The re-pigmentation was assessed according to 5-grades scale. The main findings of the study has

illustrated that out of 100 patients of vitiligo, 45% males and 55% females, treated with NBUVB with needling, 58% patients showed grade 4 response i.e. 75% or more re-pigmentation. Thus, Narrowband UVB with needling is an effective, useful and well-tolerated therapy for treatment of vitiligo[16].

A total of 40 patients of vitiligo were treated with a targeted NBUVB device twice-weekly for a maximum of 30 sessions or until 100% re-pigmentation, whichever was reached first. The extent of re-pigmentation achieved was assessed and adverse effects, if any, were also noted down. The result of the study has showed that there were 31 responders (77.5%) who achieved re-pigmentation ranging from 50% to 100%. The onset of re-pigmentation was seen as early as the 3rd dose in some cases and by the 10th dose in all responders. A total of 97 lesions were treated out of which 45 lesions (46.6%) achieved 90-100% re-pigmentation. Lesions showing 75% and 50% re-pigmentation were 14 and 15 respectively. 23 lesions failed to show any significant re-pigmentation at the end of 30 doses. Best response was seen on the face and neck with 20 of the 31 lesions achieving 90-100% re-pigmentation in this area. Duration of vitiligo was seen to have no statistically significant impact on the re-pigmentation achieved[17].

CONCLUSION

It is concluded that efficacy of Narrowband Ultraviolet B therapy for the management of patients presenting with hand vitiligo is 70.4%. So, using this treatment method we can improve patient quality of life and can reduce the psychological squeal.

Conflict of interest: Nil

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