Original Article

Efficacy of Therapeutic Needling with Narrow-Band UVB in Patients of Stable Vitiligo

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Abstract

Objective: To determine the efficacy of therapeutic needling with narrow-band UVB in patients of stable vitiligo with type IV skin, which is the most common depigmenting skin disorder, characterized by clearly demarcated discolored patches of various shapes and sizes.

Methodology: This descriptive case series was conducted on one hundred dermal skin patches of stable vitiligo in 20 patients presenting to the outdoor of Dermatology Department, Services Hospital Lahore from January- June 2019. They were subjected to therapeutic needling using 30 G disposable insulin syringe followed immediately by Narrow-Band UVB exposure thrice weekly for 6 months. The efficacy was determined by re-pigmentation of patches using "Five Grade Scale System." Patients were clinically assessed during and after completion of therapy. All the detailed information was collected through a specially designed proforma. Procedures and follow up of all the patients were conducted and SPSS version 23 was used to analyze the collected data. Descriptive and inferential statistics were used for present the results.

Results: Out of 100 dermal patches of stable vitiligo in 20 patients, 58% patches showed grade 4 response i.e 75% or more re-pigmentation, which is therapeutically the first major step of depigmentation in this process, followed by reduction of pigmentation with further therapies.

Conclusion: Therapeutic needling with Narrow-Band UVB is an effective therapy in the treatment of stable vitiligo in patients with type IV skin.

Keywords: Stable vitiligo, Narrow-Band UVB, type IV skin , Therapeutic Needling.

Introducti on

Vitiligo is an acquired dermatosis and presents as sharply demarcated white macules and patches.[1] Regardless of age, sex and race it affects 1-2% of world population.[2] It is primary, circumscribed or generalized pigmentation of skin which might be related to genetic factors, self destruction of melanocytes or oxidative stress. Stable vitiligo is defined as having no new lesions and no progression of existing lesions for at least 2 years. The first and foremost goal for vitiligo surgery is to induce re-pigmentation in depigmented part of skin. Psychological impact is profound in colored races due to stigma attached to it.[3] It has an autoimmune etiology where melanocytes are destroyed by auto-antibodies.[4] The principle of vitiligo treatment is stimulating the existing melanocytes in the affected areas or repopulating it with functioning melanocytes.[5] Medical therapies include steroids, tacrolimus, psoralens, Ultra-Violet A and Narrow Band UVB.[6] In patients refractory to medical treatments various surgical procedures like tattooing, skin grafting and therapeutic wounding are used alone or in combination with medical therapy to treat stable vitiligo.[7]

Therapeutic needling is a new treatment modality in vitiligo in which multiple superficial tiny punctures are made at the periphery of the lesion. These lesions heal with initial inflammatory response followed by epithelization.[8] While narrow band UVB has an Immune modulatory role by depleting langerhan cells in epidermis and dendritic cells in dermis which destroy melanocytes.[9]

The clinical experience with therapeutic needling and narrow band UVB is limited with few reports published in India and Pakistan. From these reports efficacy of therapeutic needling and narrow band UVB is 90% after 6 months of treatment in patients of stable vitiligo.[10]

The treatment of vitiligo remains a serious concern and challenge globally and its treatment options are diverse. This study was planned to introduce therapeutic needling as an adjunct to Narrow Band UVB in non- responding stable vitiligo as it leads to rapid clearance of lesions in short duration of time. There is insufficient literature available on this mode of treatment.

Methodology

This descriptive case series was conducted on one hundred dermal skin patches of stable vitiligo in 20 patients presenting to the outdoor of Dermatology Department, Service Hospital Lahore from January- June 2019. Hospital Ethical Committee approved the Study. Patients' data were included in the study after informed verbal consent.

Inclusion criteria included patients 14 to 60 years of age, either sex, patients having fitzpatrick type IV skin and with stable vitiligo involving less

than or equal to 10% body surface. We did not include those patient who had photo photosensitivity disorders, hepatitis and bleeding disorder. Pregnant and lactating mothers were also excluded from the study. Those patienst who had sensitive areas around involving sensitive areas like eyelids, genitalia and with poor prognostic vitiligo (segmental, lip tip type, mucosal, leukotrichia, scalp and generalized) were excluded from the study.

Demographic data like name, age, sex, address and telephone was obtained. Previous treatment was stopped eight weeks before commencement of new therapy. Patients of stable vitiligo were subjected to therapeutic needling three times weekly using 30G disposable insulin syringes after cleansing the area with alcohol swab and applying topical anesthesia for 30 minutes. Multiple tiny punctures were given intra-dermally one millimeter apart on the periphery of the lesion, making an angle of 10 to 15 degrees with the skin and pushing the needle from the periphery towards the center of the lesion. Followed immediately by Narrow- Band UVB exposure three times weekly for six months. The three series PC and SP full body phototherapy devices (Daavlin, USA) were used for the treatment.

All the protocol of phototherapy was followed. Minimal dose was calculated according to skin type. Initial dose was adjusted on the basis of 70% minimal erythema dose. The dose was increased 10 to 20% at each visit on the percentage of previous dose and erythema response. The efficacy was determined by re-pigmentation of patches using "Five Grade Scale System"(Table-1). The grading was done as, Grade-4 (76-100%) excellent, Grade-3 (51-75%) very good, Grade-2 (26-50%) good, Grade-1 (1-25%) satisfactory, Grade-0 (0%) poor results. Grade 4 signified excellent results after 6 months of treatment. Patients were clinically assessed during and after completion of therapy. The effects of phototherapy was carefuly observed on the deep pigmented patches areas. All the detailed information was collected through a specially designed proforma. Procedures and follow up of all the patients were conducted and SPSS version 23 was used to analyze the collected data. Descriptive and inferential statistics were used to interpret the results.

Results

The mean age of the patients was 19.5 years (SD±6). They included 7 (35%) males and 13 (65%) female patients (Table-2). The mean duration of the disease was 4.54 years (Table-2). In the distribution of patches by efficacy, 58% patches had efficacy of grade-4, 28% patches had efficacy of grade-3, 9% patches had efficacy of grade-2, 3% patches had efficacy of grade-1 and 2% patches had efficacy of grade-0 (Table-3). In the distribution of patches by efficacy after completion of therapy, 95%) patches had efficacy of treatment and 5% patches had no efficacy of treatment.

Table 1. Grades of Repigmentation

Efficacy (Grades)	Percentage	Result
4	76-100	Excellent
3	51-75	Very good
2	26-50	Good
1	1-25	Satisfactory
0	0	Poor

Table 2. Distribution of cases by Age, Sex, Duration of Disease

Age (years)	Patients (no.)	Percentage
Mean	19.5± 6	
11-20	14	70
21-30	5	25
31-40	1	5
Gender		
Male	7	35
Female	13	65
Duration (years)		
Mean	4.54±4.5	
0-4	12	60
5-8	3	15
9-12	4	20
13-16	1	5

Table 3. Efficacy of Treatment using 100 Dermal Patches (n=20)

Grade	Patients(no.)	Percentage	Efficacy
G4	58	58	Yes
G3	28	28	Yes
G2	9	9	Yes
G1	3	3	No
G0	2	2	No

Figure 1. Therapeutic Needling with 30G Insulin Syringe in Type IV skin

Efficiacy is the capacity to produce an effect. it is the therapeutic effect of the treatment under ideal condition. it was observed that 58% of pateins showed grade 4 response, whereas 28% of trye pateinst demonstrated grade 3 respionse to the treatment (Table 3).

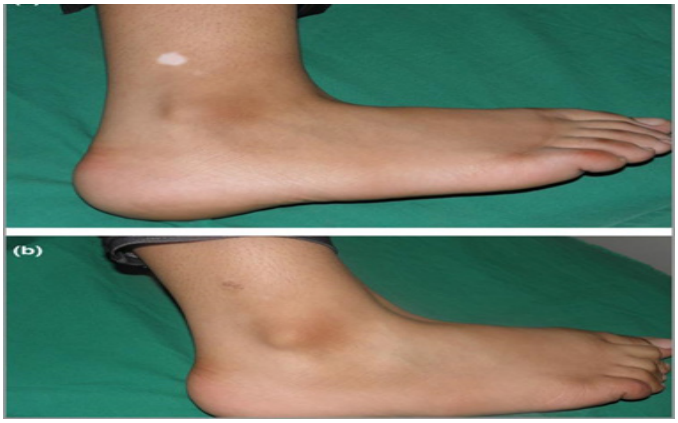

Figure 2. Vitiliginous Patches Before and After Treatment in type IV Skin Showing Grade 3 Response.

Figure 3. Vitiliginous Patches Before and After Treatment in type IV Skin Showing Grade 3 Response.

Discussion

Narrow-Band UVB is one of the first line treatment for vitiligo.[11] New research has shown that Narrow-Band UVB therapy. wounding leads to rapid clearance of stable vitiligo in short duration of time as compared to Narrow Band UVB alone.[12] In our study, 58% patches showed efficacy of grade 4 (excellent), 28% patches had grade 3 (very good), 9% patches had grade-2 (good), 3% patches had grade 1 (satisfactory) and 2% patches had grade 0 (poor). As compared with the study of Ahmad et al10, where 69% patches had efficacy of grade 4 (excellent), 25% patches had grade-3 (very good), 2.4 patches had grade-2 (good), 1.2% patches had grade 1 (satisfactory) and 2.4% patches had grade-0 (poor), which are comparable with our study.

In our study after six months of treatment the efficacy of therapy was found in 95% patches. As compared with the study of Ahmad et al.[10] and Batool et al.[13] where after six months of treatment the efficacy was found in 90% and 91% patch respectively which is comparable with our study. In contrast to our result, Ebadi et al.[14] who used needling once per week and narrow band UVB three times per week, the overall repigmentation was as low as 15.57%. Therefore, they suggested that needling is not recommended treatment for stable vitiligo. In addition, El-Zeftawy et al.[15] conducted a study to compare efficacy of narrow band UVB phototherapy versus combined narrow band UVB phototherapy and micro needling in treatment of vitiligo. In their study, Group A patients treated with narrow band UVB along with micro needling showed 80% efficacy as compared to Group B treated with narrow band UVB alone showed 20% efficacy. Mohaghegh et al.[16] studied the efficacy of narrow band UVB therapy with and without needling by insulin syringe in the treatment of vitiligo. Group B patients with narrow band UVB with needling showed greater improvement in pigmentation with 41.5% efficacy.

In our study, certain anatomical sites like face, neck, trunk and back showed better response while acral parts showed poor response of re-pigmentation. These findings agreed with Sheikh et al.[17] who conducted a study to evaluate the efficacy of combination of needling and narrow band UVB for treatment of vitiligo. They reported that best results were on the face 70%, trunk area 60% and arms 50% re-pigmentation after 12 weeks of treatment. It has been observed that young responded faster with good re-pigmentation (>75%), with lesser number of exposures and cumulative dose of NBUVB. Similarly dark skin (Fitzpatrick type IV and V) required lesser number of exposures and cumulative dose to achieve 25-75% re-pigmentation when compared with white skin (Fitzpatrick type I and II).[15 16 17] In the light of present study it is recommended that the simpler therapeutic needling technique should be used on a larger scale in future in combination with Narrow-Band UVB in the management of stable vitiligo in type IV skin as it results in a significantly higher percentage of de-pigmentation in short duration of time. Adjuvant therapy is better as both work with different mechanisms, therapeutic needling pushes the melanocytes from the pigmented areas of the skin towards the depigmented areas and causes pigmentation of skin while Narrow-band UVB destroys the Langerhan's cells which kills the melanocytes. So both modalities together enhance the clearance of vitiligo lesions in shorter duration of time with less side effects.

Conclusion

It is concluded from this study that therapeutic needling with Narrow- band UVB is an effective therapy in the treatment of stable vitiligo with type IV skin.

Limitations

The sample size included only 20 patients and thus the results obtained from the treatment cannot be generalized and applied to the entire population. There was also lack of access to scientific literature as few studies were conducted on this topic locally as well as internationally.

Authors' Contribution

SA conceptualised the project and wrote the manuscript. UA and ANC did data collection and literature search. AAS co ducted statistical analysis. SA helped with literature search. MAB did the drafting and revisions.

Conflict of interest: All authors declare no conflict of interest.

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