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NARROWBAND UVB THERAPY VS NARROWBAND UVB AND PIMECROLIMUS IN CHILDHOOD VITILIGO: A RANDOMISED CONTROLLED STUDY

Dermatology

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ABSTRACT

Background: Narrow-band ultraviolet B (NB-UVB) and pimecrolimus are proven safe options in childhood vitiligo.
Aims: To compare efficacy of NB-UVB with pimecrolimus vs only NB-UVB in childhood vitiligo.
Methods: Eighty patients were randomized into two groups and treated with NB-UVB in group A and NB-UVB with pimecrolimus in group B for 6 months. Tri-weekly radiation was started at 280 mJ/cm², with 10% increments for each subsequent treatment until minimal erythema dose was reached. Photodocumentation was done in each visit and follow-up was done for 6 months to detect any relapse.
Results: Good to excellent response in the face and neck lesions was 95% in Group B vs 50%in Group A ($p<0.05$). There was no statistically significant difference in the repigmentation rate on other body areas. No significant side effects were observed in both groups.
Conclusion: NB-UVB works better if combined with pimecrolimus 1% cream over face and neck lesions.

KEYWORDS

narrowband UVB, pimecrolimus, childhood vitiligo

INTRODUCTION:

Vitiligo is the most frequent depigmenting disorder, affecting 0.3%–0.5% of the world population.[1] Although multiple modalities are available in the therapeutic armamentarium for vitiligo, not all can be used in children with safety. Narrow-band ultraviolet B (NB-UVB) and topical immunomodulators like pimecrolimus are proven safe and effective options. The aim of our study was to compare efficacy and side effect profile of NB-UVB and pimecrolimus combination vs only narrowband therapy in childhood vitiligo. The above combination has been studied in mixed population of both adults and children, but there are no studies in literature dealing with only children.[2]

Methods:

This is a randomised control study conducted on patients attending Skin &VD OPD in a tertiary care centre. Period of study was 1 year (July2015-June16). The inclusion criteria were all vitiligo patients aged between 2 to 16 years who were not under any treatment for 8weeks. The exclusion criteria were genital and periorbital vitiligo, past history of cutaneous malignancies and photosensitivity. Formal consent and ethical clearance was obtained. Multi-utility phototherapy unit from dermaindia was used.

Eighty patients were randomized into two groups, NB-UVB was administered in group A and NB-UVB plus pimecrolimus 1% cream twice daily was administered in group B.[3] Tri-weekly radiation was started at 280 mJ/cm^2 with 10% increments in each visit until minimal erythema dose (MED) was attained. Further treatment was maintained at MED till lesion clearance or for a period of 6 months. Lesional photographs were taken at baseline and thereafter monthly to document repigmentation. Follow up was done for 6 months to observe the stability of repigmentation.

Response to treatment was measured as percentage of repigmentation. For example, on initial visit, total area of face and neck was taken as 100% by hypothetically dividing this into 4 quadrants measuring 25% each by using visual analogue scale. Now the percentage of involvement in each quadrant were taken, then by adding all four values, the percentage of depigmentation was calculated and taken as baseline. On subsequent visits, the percentage of depigmentation was reassessed in the same manner and then percentage of repigmentation was calculated by the formula: % repigmentation = 100-{(Present % depigmentation ÷ Baseline % depigmentation)}x 100. The results were scored as excellent (>75%repigmentation), good (50-75%repigmentation), moderate (25-49%repigmentation) and poor (< 25%repigmentation).

Statistical analysis:

The groups were compared & data was analyzed using SPSS version 17. The groups were compared using chi-square test for proportions and t-test for means. Statistical significance was considered with a 'p' value of less than 0.05.

RESULTS:

Out of 80 children, 60 (30 in eachgroup) completed the 1 year treatment course. Twenty patients dropped out of the study because of poor compliance due to lengthy treatment. The two groups were well matched for the demographic profile [Table 1]. After 6 months of treatment, a good to excellent clinical response (repigmentation ≥50%) was observed on facial and neck lesions in 95% of the patients in group B (NB-UVB plus pimecrolimus) compared with 50% in group A (NB-UVB alone), which was statistically significant (p= 0.011) [Figure 1]. On the trunk, 72% of the patients achieved a good clinical response in group B versus 67% in group A. On the arms, 69% of the patients in group B showed a good clinical response compared with 56% of the patients in group A. A total of 61% of the patients in group B and 55% of those in group A had a good clinical response on the legs. Repigmentation ≥50% on the hands and feet was poor (19%) in both groups [Figures 2A- 5B].The response between the groups on the extra-facial areas was not statistically significant (p>0.05). No significant side effects were reported. Only 3 (10%) patients in group A and 4 (13%) patients in group B showed side effects in the form of erythema, burning and pruritus which were self limiting or just controlled with emollients. One patient (3%) in group A developed depigmentation during 6 months follow-up.

Table 1: Epidemiological data

Total patients n=60	Group A (n=30)	Group B (n=30)
Age, years: mean ± SD	9.10 ± 4.05	9.20 ± 4.31
Sex: Male Female	16 (53.3%) 14 (46.7%)	13 (43.3%) 17 (56.7%)
Duration, years: mean ± SD	2.55 ± 1.92	2.55 ± 1.69

Family h/o	4 (13.3%)	6 (20%)
Leukotrichia	7 (23.3%)	5 (16.7%)
Types: Generalised	15 (50%)	16 (53.3%)
Localised	7 (23.3%)	6 (20%)
Acrofacial	6 (20%)	7 (23.3%)
Segmental	2 (6.7%)	1 (3.3%)
Distribution: Face & Neck	18	19
Trunk	18	18
Arms	16	16
Legs	20	18
Hands & Feet	21	21

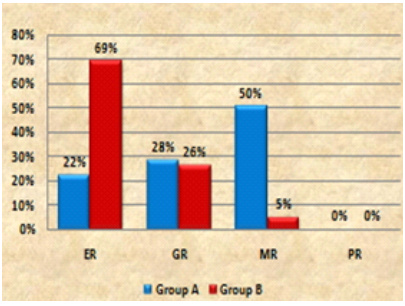

Figure 1: 6 months treatment response graph between the groups (Face and neck)

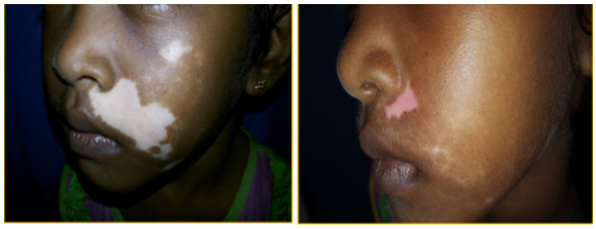

Figure 2A: Before treatment with NB-UVB (Group A). B: Excellent response after 6 months

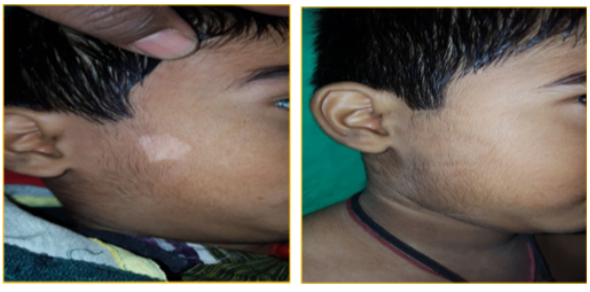

Figure 3A: Before treatment with NB-UVB+pimecrolimus (Group B). B: Excellent response after 6 months

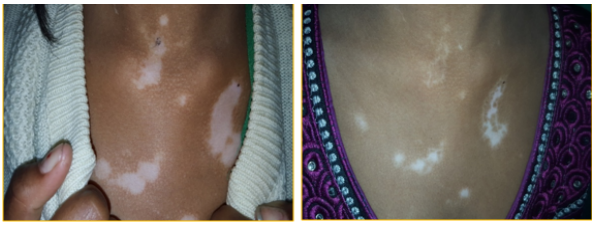

Figure 4A: Before treatment with NB-UVB (Group A). B: Good response after 6 months

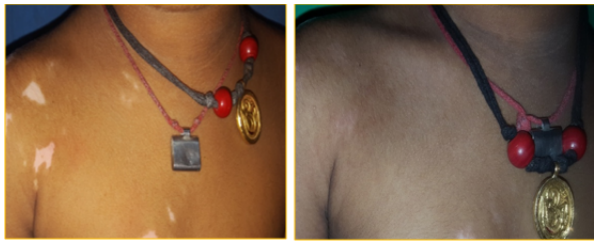

Figure 5A: Before treatment with NB-UVB+ pimecrolimus (Group B). B: Excellent response after 6 months

DISCUSSION:

Narrow band UVB (TL01, 312 ± 2 nm) has proven to be efficacious vitiligo. In children with vitiligo affecting ≥ 20% of body surface area, nbUVB has proved to be a safe and effective option.[4] In 1997, Westerhof first reported the use of NBUVB phototherapy for the treatment of vitiligo and concluded the treatment of patients with vitiligo with 311nmUVB radiation is as efficient as with topical PUVA and has fewer adverse effects. The proposed mechanism of action of NBUVB is immunomodulatory effects, thereby halting the progress of the disease and stimulating the residual outer hair root sheath melanocytes.[5]

Topical calcineurin inhibitors (TCI) have emerged as an important therapeutic modality in the treatment of childhood vitiligo, having lesser side effects when compared to long term topical steroids usage. Two common TCI used are tacrolimus and pimecrolimus. The mechanism of action involves binding of the drug to the immunophilin binding protein, thus blocking the calcineurin dephosphorylative activation of the nuclear factor of activated T cells, which translocates to nucleus initiating cytokine gene expression. Pimecrolimus has a similar mechanism of action but less potent in comparison to tacrolimus because of its decreased protein binding capacity.[2]

Combination phototherapy and topical immunomodulators might act synergistically through activation of pathways influencing the process of melanocyte mitogenesis, melanocyte migration and melanogenesis, thereby increasing the quality of repigmentation and/or hasten response times in patients with this disorder.[6]

In a double-blind, placebo-controlled clinical trial conducted by Esfandiarpour *et al*[3], after 12 weeks of treatment, a clinical response (repigmentation ≥50%) was observed on facial lesions in 64.3% of the patients in group 1 (pimecrolimus plus NB-UVB) compared with 25.1% in group 2 (placebo plus NB-UVB), which was statistically significant (p <0.05%). On the trunk, 42.8% of the patients achieved a clinical response in group 1 versus 47.4% in group 2. On the arms, 33.3% of the patients in group 1 showed a clinical response compared with 40% of the patients in group 2. A total of 25% of the patients in group 1 and 28.6% of those in group 2 had a clinical response on the legs. The repigmentation rate in the two groups on the extra-facial areas was not statistically significant. The clinical response on the hands and feet was poor, in both groups. Our study also showed similar type results in comparison to the above study. Dawid *et al.* compared the efficacy of pimecrolimus cream versus a simple vehicle for symmetrical vitiligo lesions of skin areas except on the face, showing no differences of repigmentation rates between the two types of treatment.[7] In a randomized, placebo-controlled, double-blind study, NB-UVB therapy combined with tacrolimus 0.1% ointment was compared with NB-UVB alone in nine patients with generalized vitiligo. Eight patients completed the study. The targeted lesions were located on the trunk and limbs. The result of this study suggests that tacrolimus does not exert any significant benefit over NB-UVB alone.[8] However, there was no facial lesion in this study.

Side effects were minimal and comparable in both groups in our study. In an open-labeled prospective study by Fai *et al*., 9% patients complained of mild and transient burning sensation after application of tacrolimus ointment to the eyelids or periocular area. In 5 % patients, phototherapy caused symptomatic erythema, which required a transient interruption of NB-UVB treatments for 1–2 weeks resulting in complete remission. Side effects were self-limiting or easily controlled with emollients.[9]

In a study by Kumar*et al*, all the patients had good stability of repigmentation with only 1 (2.8%) patient who developed depigmentation of repigmented sites during the followup period of 12 months, which was similar to our study .[10]

Our study has the limitations of having smaller sample size and is not double blinded.

To conclude, NB-UVB works better if combined with pimecrolimus 1% cream over face and neck lesions. The combination is safer in children with good stability of repigmentation.

REFERENCES:

1. Das SK, Majumder PP, Chakraborty R, Majumdar TK, Haldar B. Studies on vitiligo. I. Epidemiological profile in Calcutta, India. Genet Epidemiol 1985;2:71-8.
2. Kanwar AJ, Kumaran MS. Childhood vitiligo: treatment paradigms. Indian J Dermatol

2012 Nov;57:466-74.
3. Esfandiarpour I, Ekhlasi A, Farajzadeh S, Shamsadini S. The efficacy of pimecrolimus 1% cream plus narrowband ultraviolet B in the treatment of vitiligo: A double blind, placebo controlled clinical trial. JDermatolog Treat 2009;20:14–8.
4. Kanwar AJ, Dogra S. Narrowband UVB for the treatment of generalized vitiligo in children. ClinExpDermatol 2005;30:332–6.
5. Fitzpatrick TB. Mechanisms of phototherapy in vitiligo. Arch Dermatol 1997;133:1591–2.
6. Kawalek A Z, Spencer JM, Phelps RJ. Combined excimer laser and topical tacrolimus for the treatment of vitiligo: A pilot study. DermatolSurg 2004;30:130–5 .
7. Dawid M, Veensalu M, Grassberger M, Wolff K. Efficacy and safety of pimecrolimus cream 1% in adult patients with vitiligo: results of a randomized, double-blind, vehicle-controlled study. J DtschDermatolGes 2006;4:942-6.
8. Mehrabi D, Pandya AG. A randomized, placebo-controlled, double blind trial comparing narrow-band UV-B plus placebo in the treatment of generalized vitiligo. Arch Dermatol 2006;142:927–9.
9. Fai D, Cassano N, Vena GA. Narrow-band UVB phototherapy combined with tacrolimus ointment in vitiligo: A review of 110 patients. J EurAcadDermatolVenereol 2007;1:916–20.
10. Kumar Y H, Rao G R. Narrow-band ultraviolet B in childhood vitiligo: An open prospective uncontrolled study in 28 children of South India. Indian J PaediatrDermatol 2015;16:17-22.