Abstract: Background: Vitiligo is an acquired depigmentation disorder of great cosmetic importance, affecting 1% of the general population. There are multiple modalities of treatment and photochemotherapy is the most commonly used treatment modality in extensive vitiligo, but is associated with many short- and long-term side-effects. Recently, narrow-band ultraviolet B (NBUVB) therapy has been reported to be an effective and safe therapeutic option in patients with vitiligo. We have evaluated the efficacy and safety of NBUVB (311 nm) therapy in Indian patients with generalized vitiligo.

Methods: Fourteen patients (six males and eight females), aged 5-45 years, with generalized vitiligo, were treated thrice weekly with NBUVB radiation therapy for a maximum period of 1 year.

Results: At the end of 1 year, 10 patients (71.42%) had marked to complete re-pigmentation and two each (14.3%) had moderate or mild re-pigmentation. The response to therapy was correlated with the sites of involvement, duration of disease, age of patient and type of re-pigmentation to therapy. Adverse events were limited and transient.

Conclusion: NBUVB therapy is effective and safe in Indian patients with non-segmental vitiligo. Long-term follow up is required, however, to establish the stability of re-pigmentation.

Keywords: NBUVB, Non-segmental vitiligo, peri- follicular pigmentation

Introduction:
Vitiligo, an acquired pigmentary disorder of unknown origin, is the most frequent cause of de-pigmentation worldwide, with an estimated prevalence of 1%. The disorder can be psychologically devastating, traumatizing and stigmatising, especially in dark skinned individuals which is clinically characterized by the development of white macules due to the loss of functioning melanocytes in the skin or hair, or both. Two forms of the disease are well recognized: segmental and non-segmental vitiligo (the commonest form).\(^{(1)}\)

Vitiligo is clearly more noticeable in darker races and can be a source of considerable psychologic distress and social isolation. In some cultures, such as ours, there is marked stigma associated with vitiligo, thus challenging the dermatologist for effective management.\(^{(2)}\)

The exact etiology of vitiligo is not known but genetic predisposition, neural theory, the autoimmune hypothesis, the reactive oxygen species model, zinc-?-2-glycoprotein deficiency hypothesis, viral theory, intrinsic theory and biochemical, molecular and cellular alterations accounting for loss of functioning melanocytes in vitiligo. It’s a multifactorial disease involving the interplay of several factors.\(^{(3)}\)

Various surgical and non-surgical modalities have been described for treatment of vitiligo. Non-surgical modalities are used as first choice, includes corticosteroids (topical, oral, intralesional), psoralen (topical, oral) alone or with combination with sunlight or ultraviolet A light.\(^{(4)}\)

Narrow band ultraviolet B (NBUVB) is a new treatment modality for vitiligo with limited clinical experience in India so we present our experience of NBUVB monotherapy for treatment of non-segmental vitiligo.

Materials and Methods:
After institutional ethical committee clearance, eighteen patients with non-segmental vitiligo were recruited. Whole procedure, schedule of phototherapy and need of regularity were explained and informed consent was taken. Patients on photoallergic and phototoxic drugs, patients with photo aggrevating dermatosis like phorphyria, systemic lupus erythematosus, xeroderma pigmentosa, atypical nevi, mental illness and phobia to closed chamber were excluded from the study. For patients using any local or systemic immunosuppressive therapy, a washout period of at least 6 weeks was required. A complete general and systemic examination was carried out. A thorough dermatological examination was carried out and approximate percentage of body surface area involvement was calculated by using "Rule of Nine". All patients were treated with NBUVB as a monotherapy in phototherapy unit. Therapy was administered three times
per week on nonconsecutive days. A standard initial dose of 0.25J/cm² (250 mj/cm²) was started in all patients. During each treatment, only affected parts were exposed with protection of genitals and shielding of eyes. The irradiation dose was increased by 20% for each subsequent visit till the optimal constant dose was achieved when minimal erythema occurred in the lesions.

If symptomatic erythema (burning, pain) or blistering developed, the irradiation dose was omitted till erythema or blistering subsides and after recovery phototherapy was again started with 50% of the previous dose. Patients were advised to apply sunscreen on exposed areas and to protect their skin from excessive sun exposure. Once 75% repigmentation had been achieved, the frequency of treatment was tapered to twice weekly until 100% repigmentation was achieved or the 12-month treatment period was complete, whichever was earlier. If there was no repigmentation even after six months of therapy, NBUVB was discontinued. All patients were examined by the same dermatologist at four-week intervals. Photography of the lesions was performed in a standard pose at baseline and at four-monthly intervals thereafter to document the pattern and extent of repigmentation. Response to treatment was assessed by comparing the area of repigmentation of lesions at the end of a course of therapy. The patients were followed up for six months. Based on the area of repigmentation, the treatment outcome was classified as marked to complete (>75%), moderate (50-75%), or mild (<50%) repigmentation. All the patients were followed-up for 6 months after termination of therapy to observe the stability of repigmentation.

Results: Out of 18 patients recruited, four patients were lost to follow-up because of inability to attend thrice-weekly visits at clinic. Fourteen patients completed at least one year therapy or were continuously to receive therapy subsequently. There were eight females and six males aged between five and 45 years. (figure1) All patients were of skin prototype V. The duration of disease ranged from three months to 14 years. Disease stability was noted in six (42.85%) patients while eight (57.14%) patients were having progressive disease.

At the commencement of therapy for one year, 10 (71.42%) patients showed almost complete repigmentation, two (14.28%) patients showed moderate and two (14.28%) patients showed mild pigmentation. By Linear discriminate analysis, the mean duration of disease to show marked complete pigmentation was nine months and the mean duration was 13 years (156 months) for mild re-pigmentation i.e., early disease responded better to NBUVB phototherapy than chronic disease. Linear discriminate analysis also showed that younger patients showed more marked-complete than the older one, the mean age of patient to show re-pigmentation was 15 years, compared to 40 years in mild re-pigmentation. Body parts such as face and neck responded better than hands, feet, areas over bony prominences like elbow and areas with low density of hairs. The most common type of repigmentation was perifollicular which was seen in nine (64.28%) patients, three (21.42%) patients showed diffuse and marginal re-pigmentation was seen in two (14.28%) patients. It shows that hair follicles might be predominant source of pigmentation. (Table1). The re-pigmentation noticed after phototherapy had better match with surrounding skin though. On follow-up four patients developed de-pigmented macules which were treated in similar way that of older lesions.

The adverse side effects were xerosis four (28.57%), pruritus four (28.57%), burning three (21.4%) and these were minimal and managed with topical application of emollient. One patient developed blister formation which was managed by reduction of dose therapy and therapy was well tolerated after resolution of symptoms.

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<th>Table No.1. Types of repigmentation</th>
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<td>Diffuse</td>
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<tr>
<td>Marginal</td>
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<th>Table 2: Side effects of NBUVB</th>
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<td>Blister</td>
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<td>None</td>
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<td>Pruritus</td>
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Fig. 1 Age distribution of vitiligo
Discussion:
Phototherapy with NBUV is safe and effective treatment modality for a continuously increasing number of skin diseases including vitiligo. It is low erythemogenic with high therapeutic efficacy. It's safe modality to treat vitiligo not only in all age group but It's safe even in childhood vitiligo with good stability of repigmentation. Westerhof and Nieuweboer-Krobotova reported in their comparative study between NBUVB and PUVA , 67% patients treated with NBUVB showed repigmentation while 46% patient treated with PUVA showed re-pigmentation after 4 months of phototherapy. Scherschum et al. retrospectively analyzed patients treated with thrice a week NBUVB for 1 year. 5 of 7 patients showed more than 75% re-pigmentation whereas remaining two patients showed 50% and 40% respectively.

In our study patient with long standing disease showed less re-pigmentation i.e., duration of disease had inverse relation with extent of repigmentation which was also seen in study by Scherschum et al. Our study also showed that re-pigmentation was achieved better in younger patient than older patient. Some areas responded better than others. The face and neck showed better repigmentation than hands, feet, areas over bony prominences like elbow and areas with low density of hairs and similar finding has been reported in previous studies in vitiligo by scherschum et al, Kishan Kumar YH et al, Girish et al. The most common type of repigmentation was perifollicular which was seen in 10 (71.42%) patients followed by diffuse and marginal repigmentation was seen in two patients in each group, this finding was also reported by Kishan Kumar YH et al. No correlation could be found between sex and extent of repigmentation, similar result was seen in study by Girish et al.

The adverse effects like xerosis, burning, pruritus were developed which were also reported in study by Kishan Kumar YH et al. Side effect like blister which was developed in single patient, such blistering side effect was also reported in study by Girish et al.

Conclusion:
NBUVB is an effective and safe modality of treatment in all age group with cosmetically better repigmentation and minimal side effects.

References:

This article received on 25/09/2015; accepted on 23/11/2015

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