ORIGINAL ARTICLE

Comparative Study of PUVA Vs NB-UVB Vs P-NBUVB for Treatment in Patients with Non-Segmental Vitiligo

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Abstract

Objective: *To evaluate and compare the efficacy of NB-UVB vs P-NBUVB vs PUVA therapies in patients with non-segmental vitiligo. To study the evaluation parameters and calculate the extent of repigmentation in response to these therapies on the basis of improvement in VASI scoring.* ***Methods:*** *60 cases of previously untreated patients presenting with non-segmental vitiligo and having more than 5% body surface area involvement were randomly allocated to receive either NB-UVB or P-NBUVB or PUVA with twenty patients in each group and response to therapy was compared in NB-UVB, P-NBUVB and PUVA groups with reference to percentage change in VASI scores. Therapeutic response was also done using type and colour of repigmentation and patient tolerance to therapies.* ***Result:*** *The dominant repigmentation seen in study is perifollicular. The percentage of improvement is greater in patients with vitiligo vulgaris in NB-UVB. Good colour match is observed in all patients on NB-UVB and The percentage change in repigmentation for patients treated with NB-UVB after completion of 80 sessions of therapy is 63.15%, for P-NBUVB therapy is 61.83% and for PUVA therapy is 64.69% (P=<0.0001).*
Conclusion: *No statistically significant difference is reported in percentage of repigmentation after completion of 80 sessions of therapy by all the three treatment modalities. The best color match is observed in the group on NB-UVB exposure. Side effects worsened progressively from NB-UVB to P-NBUVB and PUVA in that NBUVB was best tolerated.*

Keywords*: Vitiligo, Repigmentation, PUVA Therapy*

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Introduction

Vitiligo, the most common depigmentation disorder, has great cosmetic significance. It is characterized by selective destruction of functional melanocytes causing depigmentation of the skin, hair and mucosal surfaces. It affects approximately 1 to 2% of the world's population, with no predilection for age, gender, or ethnic background [(1)]. The exact pathogenesis of vitiligo is not known. The most favored theory states vitiligo to be familial disease of autoimmune etiology. Vitiligo causes considerable psychosocial distress particularly among the affected individuals of appearing color. There are numerous medical and surgical interventions available to treat vitiligo, but currently, most practiced therapies for vitiligo are systemic or topical corticosteroids, UV radiation therapy (phototherapy and photochemotherapy), calcineurin inhibitors, topical vitamin D derivatives, pseudocatalase, laser therapy and surgical treatment[(2)]. Among all therapeutic agents used for the treatment of vitiligo, none is clearly a definitive cure. Of all the treatment modalities available for vitiligo, those using light–in particular ultraviolet (UV) light – are considered gold standard[(2)].

Materials & Methods

This comparative study was conducted at the Department of Dermatology, Venereology and

Leprology, Dr. D.Y. Patil hospital and research centre, Pimpri, Pune from July 2014 to September 2016. A total sixty cases of previously untreated non-segmental vitiligo of ages ranging from thirteen to seventy years and having more than 5% body surface area (BSA) involvement were included in the study and were randomly allocated to receive either NB-UVB or P-NBUVB or PUVA with twenty patients in each group. One patient from P-NBUVB group and 3 patients from PUVA group dropped out of the study. Patients with a history of previous skin malignancy, lupus erythematosus, intolerance to phototherapy or photochemotherapy, taking photosensitizing drugs and pregnant or lactating females were excluded from the study. A written and informed consent was taken from all individuals participating in the study after explaining the benefits and due risks of the study in the language they understood best. Dermatological examination regarding extent and severity of vitiligo was done according to VASI score.

These patients were prescribed phototherapy or photochemotherapy in the form of NB-UVB or P-NBUVB or PUVA for 80 sessions. Therapy was administered thrice a week on non-consecutive days. The standard initial dose of 250mJ/cm^2 was started and increased by 50mJ/cm^2 increments after 3 subsequent visits depending on the maximum erythema observed in the previous session. Patients were not started on any other modality of treatment. Patients in NBUVB and P-NBUVB groups were treated in a full body phototherapy unit machine (Derma India, Spiegel series) consisting of 24 Philips Holland tubes (100W). Patients in PUVA and P-NBUVB group were advised to take oral 8-methoxypsoralen at a dose of 0.6 mg/kg body weight, rounded off to the nearest 10 mg, 2 hour prior to each treatment session. No psoralen was given to patients in NB-UVB group. Patients in PUVA group received UVA therapy through full body phototherapy unit machine (Derma India, Spiegel series) consisting of 36 Phillips Holland tubes (100W). In case of symptomatic erythema, burning pain or blistering, the irradiation dose was decreased by 20%. Response to therapy was compared in NB-UVB, P-NBUVB and PUVA groups with reference to percentage change in VASI scores. Comparison of therapeutic response was also done using type and colour of repigmentation and patient tolerance to therapies. No photo testing was performed as all the patients were of skin type IV and V. Those patients who failed to show any repigmentation even after 3 months of regular and adequate treatment were labelled as treatment failure/non-responders and their further treatment was stopped. In case of responsive patients the treatment was planned for a maximum period of 2 years.

Results

The dominant repigmentation seen in our study was perifollicular which was seen in all the patients from NB-UVB, P-NBUVB and PUVA groups, out of which 6 (30%), 5 (26.31%) and 8 (47.05%) patients also had associated marginal repigmentation (Table-1). Good colour match was observed in all patients on treatment with NB-UVB and P-NBUVB whereas colour match was darker in comparison to adjacent normal skin in 7 (45%) patients on PUVA therapy (Table- 2). Patients on NB-UVB showed side effects like erythema (40%) and pruritus (5%), those on P-NBUVB showed side effects like nausea (50%), erythema (35%), dizziness (25%), headache (20%) and pruritus (15%). Patients on PUVA therapy showed side effects like headache (50%), nausea (40%), vesiculation (30%), erythema (10%), dizziness (25%) and pruritus (5%).

Table 1: Type of repigmentation-wise distribution of cases in study groups

Type	NB-UVB (%)	P-NBUVB (%)	PUVA (%)	Total (%)
Perifollicular	20 (100)	19 (100)	17 (100)	56 (100)
Marginal	6 (30)	5 (26.31)	8 (47.05)	19 (33.92)
Both	6 (30)	5 (26.31)	8 (47.05)	19 (33.92)
Total	20 (100)	19 (100)	17 (100)	56 100)

Chi-square =1.95, P=0.38

The percentage change in repigmentation for patients treated with NB-UVB after completion of 80 sessions of therapy was 63.15%. (P=<0.0001) table-3. The percentage change in

repigmentation for patients treated with P-NBUVB after completion of 80 sessions of therapy was 61.83%. (P=<0.0001) table- 4. The percentage change in repigmentation for patients treated with PUVA after completion of 80 sessions of therapy was 64.69%. (P=<0.0001) table-5.

Table 2: Colour of repigmentation-wise distribution of cases in study groups

Colour	NB-UVB (%)	P-NBUVB (%)	PUVA (%)	Total (%)
Good	20 (100)	19 (100)	7 (45)	46 (82.14)
Dark	0	0	10 (55)	10 (17.86)
Total	20 (100)	19 (100)	17 (100)	56 100)

Chi-square =25.79, P<0.0001

Table 3: Comparison of pre-treatment and post-treatment VASI in NB-UVB group

Parameter	Pre (n=20)		Post (n=20)		Wilcoxon Z Value	P Value
	Mean	SD	Mean	SD		
VASI	16.69	4.96	6.15	2.19	3.92	<0.0001

Percentage change = 63.15%

Table 4: Comparison of pre-treatment and post-treatment VASI in P-NBUVB group

Parameter	Pre (n=19)		Post (n=19)		Wilcoxon Z Value	P Value
	Mean	SD	Mean	SD		
VASI	19.57	8.77	7.47	4.24	3.82	<0.0001

Percentage change = 61.83%

Table 5: Comparison of pre-treatment and post-treatment VASI in PUVA group

Parameter	Pre (n=17)		Post (n=17)		Wilcoxon Z Value	P Value
	Mean	SD	Mean	SD		
VASI	15.21	3.44	5.37	1.67	3.62	<0.0001

Percentage change = 64.69%

Discussion

The most common pattern of repigmentation observed in our study (38; 67%) patients was perifollicular; seen in 14(70%), 14(73%) and 10(58%) patients from NB-UVB, P-NBUVB and PUVA groups respectively. Prasad et al. who assessed pattern of repigmentation in vitiligo also found perifollicular pattern of repigmentation in 83% of their study patients [3]. Similar results were observed in various other studies from India and abroad [4-6]. Yones et al. observed follicular repigmentation in 22 patients (88%) in NB-UVB group and 23 patients (92%) in PUVA group in their study [5]. We observed a good colour match in 18(90%) patients from NB-UVB group, 16(84%) patients from P-NBUVB group whereas colour of the vitiliginous skin was darker in comparison to adjacent normal skin in 7(42%) patients on PUVA and 3(16%) patients on P-NBUVB therapy. Yones et al. in a randomized double blind trial on efficacy of PUVA and NB-UVB in vitiligo also noted darker repigmentation in majority(56%) patients receiving PUVA therapy[5]. Bansal et al. in his study observed hyperpigmentation in 5 (25%) patients in the P-NBUVB group, as compared with 1 (5%) patient in the NBUVB group and concluded that psoralens add their photochemical effect to the melanogenic effect of phototherapy, leading to a greater degree of pigmentation[7].

In our study 43 (70%) patients experienced side effects. The most important side effect observed in our study was nausea and was present in 10 (50%) from P-NBUVB group and 8 (40%) from PUVA group. Similarly Bansal et al.[7] observed nausea and hyperpigmentation more commonly with P-NBUVB after consumption of methoxy psoralen as compared to NB-UVB. Headache and dizziness was seen in 10(50%) and 5(25%) patients in PUVA group and 4(20%) and 5(25%) patients from P-NBUVB group; PUVA group additionally showed vesiculation in 6(30%) patients in our study. SS Yones[5] noticed fewer side effects in NB-UVB therapy as compared to PUVA which was similar to that seen in our study where the only side effects noted with NB-UVB were erythema and

pruritus in 8(40%) and 1(5%) patient respectively.

El Mofty observed erythema in all the patients on P-NB-UVB and PUVA after 30 sessions whereas erythema was observed in only 2(10%) patients from P-NBUVB and PUVA groups in our study[8]. Although NB-UVB has notably fewer adverse effects when compared to PUVA and P-NBUVB therapy, it has been known to cause phototoxic reactions and tanning in Caucasians. In a study by Nicolaidou et al; minimal adverse effects were seen in patients on NB-UVB, 8% patients developed painful erythema that resolved after 2 to 3 days [9]. Westerhof et al.[10] encountered no adverse effects on treatment with narrowband UV-B radiation, contrary to those seen with PUVA. A meta-analysis by Ngoo et al. in 1990 showed that NB-UVB was the safest and most effective treatment for generalized vitiligo, with fewer adverse effects compared to PUVA therapy [11].

At the end of our study, i.e. after 80 sessions, NB-UVB, P-NBUVB and PUVA therapy produced a significant improvement in VASI scores (NB-UVB, $P<0.0001$; P-NBUVB, $P<0.0001$ and PUVA, $P<0.0001$). The percentage of repigmentation by NB-UVB, P-NBUVB and PUVA groups was 63.15%, 61.83% and 64.69% respectively.

Conclusion

It can be concluded that differences does not exist between various treatment modalities as far as repigmentation is concerned. Although greater repigmentation was observed in the study group treated with P-NBUVB, followed by that treated with PUVA and the least in that treated with NB-UVB after 40 sessions. But differences do not exist after all the sessions. Best colour match is with NB-UVB exposure while with it is darker with P-NBUVB and worst colour match is with PUVA. Side effects worsened progressively from NB-UVB to P-NBUVB and PUVA in that NBUVB was best tolerated.

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