

*Research Article***Effect of NB-UVB on Stable Vitiligo****Reem A. Hawas, Hamza A. Mohamed and Sahar S. Boreiy**

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**Abstract**

Vitiligo is a chronic cutaneous disease characterized by milky white depigmented patches that leave psychological impact on the patient's life. New treatment modalities have been developed to shorten the duration of treatment with the least side effects. **Objective:** To evaluate the efficacy of NB-UVB in treatment of stable vitiligo. **Patients and methods:** This study included 20 patients with stable vitiligo. They were treated by NB-UVB (2 sessions weekly) for 6 months. **Results:** The studied patients reported clinical improvements as follow: marked response in 20%, good response in 10% and poor response in 60%. No side effects were reported. **Conclusion:** The present study augmented the efficacy of NB-UVB phototherapy in vitiligo.

**Keywords:** Vitiligo, chronic cutaneous disease, side effects**Introduction**

Vitiligo is an acquired chronic depigmenting disorder characterized by white macules or patches corresponding histologically to a substantial loss of functioning epidermal pigment cells, of hair follicle melanocytes, with an estimated prevalence of 0.5% of the general population (Boniface et al., 2018).

The exact etiology of vitiligo is not well known, it is complex and involves the interplay of multiple factors and theories (Arora and Kumaran, 2017). Multiple mechanisms, including metabolic abnormalities, oxidative stress, generation of inflammatory mediators, cell detachment and autoimmune responses, might contribute to the pathogenesis (Maresca et al., 2015).

Vitiligo continues to be a major dermatologic challenge, despite availability of large therapeutic modalities. Therapeutic strategies for vitiligo include nonsurgical and surgical methods (Bacigalupi et al., 2012).

Phototherapy has been used as the main treatment modality for patients with vitiligo. Different forms of phototherapy for vitiligo include broadband UVB (BB-UVB), narrow-band UVB (NB-UVB), excimer light and excimer laser, and psoralen plus UVA (PUVA) (Esmat et al., 2017). When comparing UVB and PUVA carcinogenic risk, a single PUVA

increase risk 7 times more than a single UVB treatment (Lim and Stern, 2005).

Light induces activation, proliferation and migration of inactive melanocyte stem cells in the outer root sheath of hair follicles and perilesional skin. Proliferation is induced by release of melanocyte growth factors such as basic fibroblast growth factor (bFGF) and endothelin-1 from keratinocytes. NB-UVB also induces tyrosinase to produce melanin (Yazdani Abyaneh et al., 2014).

**Aim of the work**

The aim of our work was to evaluate the efficacy of NB-UVB as monotherapy of stable vitiligo.

**Patients and methods**

The current study was a randomized study, throughout the period from December 2018 till March 2021. It was conducted on 20 patients attending the dermatology outpatient clinic of Minia University Hospital who were presented with stable vitiligo.

**Phototherapy**

All patients were treated with NB-UVB phototherapy twice a week with a total of 48 sessions (6 months).

**Follow up of patients**

All vitiliginous areas were carefully monitored

and photographed before and after treatment. The outcome was visually scored as the percentage of repigmentation of the depigmented lesions. Repigmentation was scored as poor (1–25%), fair (26–50%), good (51–75%), very good (76–90%) and excellent to complete (91–100) response depending on the extent of repigmentation.

**Statistically analysis**

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp). Qualitative data were described using number and percent. The Kolmogorov-Smirnov test was used to

verify the normality of distribution Quantitative data were described using range (minimum and maximum), mean, standard deviation, median and interquartile range (IQR). Significance of the obtained results was judged at the 5% level.

**Results**

**Regarding the age, sex of the patients and disease duration:**

Our study was conducted on 20 patients, of whom 3 (15%) were males and 17 (85%) were females. The age of patients ranged from 6 to 55 years with a mean ±SD of 34.23 ± 11.26. Disease duration ranged from 1 year to 3 years with a mean ±SD of 2.09 ± 0.83 (**Tab 1**).

<b>Group I</b>	
<b>Age (years)</b>	
Range	6 – 55
Mean± SD	34.23 ± 11.26
<b>Duration (years)</b>	
Range	1– 3
Mean± SD	2.09 ± 0.83
<b>Sex</b>	
Male	3 (15%)
Female	17 (85%)

**Response to treatment:**

It was assessed using clinical assessment before treatment and after 6 months of treatment. Marked repigmentation > 75% was achieved in

20% of cases. Good response (51- 75%) in 10% of cases. Mild response (1 – 25%) in 60% of cases. No response in 10% of cases (**Tab 2**).

**Table (2): Clinical response grading after 6 months of NB-UVB**

<b>Response grading</b>	<b>No.</b>
No response (0%)	2 (10%)
Poor response (<25%)	12 (60%)
Fair response (26-50%)	0 (0.0%)
Good response (51-75%)	2 (10%)
Very good (76-90%)	4 (20%)
Excellent response (91-99%)	0 (0.0%)
Complete repigmentation	0 (0.0%)

The percentage of repigmentation ranged from 0.0 – 80.0% with a mean ± SD of 24.65 ± 31.80 (**Tab 3**).

**Table (3): Clinical response after 6 months of NB-UVB.**

<b>Response (%)</b>	
Range	0.0 – 80.0
Mean ± SD.	24.65 ± 31.80

Reactivation was noticed in 5 cases (25%) and all cases repigment again 6 months after treatment except 1 case (5%) which failed to repigment till end of treatment. No adverse side effects were reported in cases treated with NB-UVB.

## Discussion

Vitiligo is characterized by milky white macules, well defined, round, oval or linear in shape, often with scalloped margin (Behl et al., 2003).

Vitiligo affects approximately 1% of the world population of all skin types (Ezzedine et al., 2015). It is a multifactorial disorder. The psychological impacts of vitiligo are completely evident (Mohaghegh et al., 2012).

The amelanotic macules in vitiligo are found particularly in areas of repeated friction, chronic pressure or trauma, for example the hips, dorsa of the hands/fingers, feet, elbows, knees and ankles (van Geel et al., 2011).

The role of autoimmunity is more prominent in generalized vitiligo (GV), which is considered a complex disorder involving combined pathogenic effects of multiple susceptibility genes and unknown environmental factors that lead to autoimmune destruction of melanocytes (Spritz, 2010).

The management of vitiligo becomes challenging considering its complex etiopathogenesis. There is no definite cure available for vitiligo (Taieb, 2012).

Phototherapy, including psoralen-UVA (PUVA) and narrowband UV-B (NB-UVB) therapy, constitutes the principal treatment modality for generalized vitiligo, whereas excimer laser therapy and various topical agents are used to treat localized disease (Bae et al., 2017).

Phototherapy especially NB-UVB has emerged as one of the safest and most effective therapy for this condition. Although PUVA phototherapy is effective, it has several limitations, including phototoxic effects, nausea, and potential risk for skin cancer (Kishan Kumar et al., 2009).

Westerhof et al., 1997 first reported the use of narrowband UVB phototherapy for the treatment of vitiligo. In their comparative study of twice-weekly topical PUVA to twice-weekly narrow-band UVB phototherapy, 67% of the patients undergoing narrow-band UVB phototherapy showed repigmentation compared with 46% of the patients receiving topical

PUVA after 4 months of therapy. Authors concluded that NB-UVB was slightly but not significantly more effective than topical PUVA.

NB-UVB seems to inhibit the effect of cytotoxic T lymphocytes and stimulate melanocyte migration and proliferation (Esfandiarpour et al., 2009).

The present study included 20 patients with vitiligo who were subjected to NB-UVB phototherapy sessions twice weekly for six months as a monotherapy modality.

The age of total vitiligo patients ranged from 6-55 years with a mean of  $34.23 \pm 11.26$  years, 15% males and 85% females (Table 1). Disease duration ranged from 1 year to 3 years with a mean  $\pm$ SD of  $2.09 \pm 0.83$ . The difference of the percentages between our study and the others (Arca et al., 2006; El-Zeftawy et al., 2019) regarding the age, sex, disease duration may be attributed to different number, races and genetics of the patients, also different environmental factors, and may be since vitiligo varies considerably among different geographical regions and ethnic groups.

In our study, repigmentation > 75% was achieved in 20% of cases. Good response (51-75%) in 10% of cases. Mild response (1 – 25%) in 60% of cases.

Arca et al., 2006 in their study, they assessed efficacy of NB-UVB as a monotherapy and in combination of topical calcipotriol. They achieved marked/ complete response (50-100%) in 41.67%, moderate response (25-49%) in 37.5% and 20.83% were minimal response (0-24%) in NB-UVB group. That was higher than our results.

Goktas et al., 2006 also evaluated the efficacy of NB-UVB alone versus its combination with topical calcipotriol. They achieved good response (51-75%) in 25% of cases. Moderate response (26-50%) in 45.8% while none achieved excellent response (76-100%). That was lower than our results as we attained marked repigmentation in 13.6%.

Klahan and Asawanonda, 2009 assessed efficacy of NB-UVB versus NB-UVB and topical tacrolimus. They recorded repigmentation > 50% in 15% of patients received only

NB-UVB for 12 weeks. That was lower than our result, this might be due to their shorter duration of therapy being only 3 months.

Bae et al., 2017 evaluated efficacy of phototherapy in vitiligo. Comparing between NB-UVB and PUVA, they revealed that 37.4% of patients achieved an at least moderate response ( $\geq 50\%$  repigmentation) within 6 months of NB-UVB phototherapy that was closer to our results. 25.8% and 25.0% of patients did not achieve a mild response ( $\geq 25\%$  repigmentation) within 6 or 12 months. They verified that phototherapy requires at least 1 year to achieve a maximal treatment response.

Parsad et al., 2006 in their comparative study between NB-UVB and PUVA, showed marked to complete repigmentation in 41.9%. Moderate improvement in 32.2% and the remaining patients showed no to mild repigmentation in NB-UVB group. They receive three sessions per week for six months.

In conclusion, our findings support the previous observations that narrow-band UVB is an effective and well-tolerated treatment option for patients with vitiligo.

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