TÜBİTAK

Turkish Journal of Medical Sciences

http://journals.tubitak.gov.tr/medical/

Research Article

Turk J Med Sci
(2017) 47: 381-384
© TÜBİTAK
doi:10.3906/sag-1512-59

The efficacy of narrowband UVB treatment in pediatric vitiligo: a retrospective analysis of 26 cases

Serkan YAZİCİ*, Berrin GÜNAY, Emel BÜLBÜL BAŞKAN, Kenan AYDOĞAN, Hayriye SARICAOĞLU, Şükran TUNALI
Department of Dermatology and Venereology, Faculty of Medicine, Uludağ University, Bursa, Turkey

Received: 10.12.2015 • **Accepted/Published Online:** 10.03.2016 • **Final Version:** 18.04.2017

Background/aim: Narrowband UVB (Nb UVB) treatment is commonly used for the management of psoriasis and atopic dermatitis, and is less often used for vitiligo in children. The aim of this study was to evaluate the efficacy and short-term safety of Nb UVB phototherapy in children diagnosed with vitiligo retrospectively

Materials and methods: A total of 26 patients younger than 18 years with the diagnosis of vitiligo and managed with Nb UVB phototherapy as documented in archive records were evaluated. Clinical response was assessed according to repigmentation of the lesions: good response when there was more than 75% repigmentation, moderate response when there was 25%–74% repigmentation, poor response when repigmentation was less than 24%, and unresponsive when there was no pigmentation and new lesions occurred.

Results: A total of 26 patients received Nb UVB treatment; 14 were girls and 12 were boys. The age at onset of the disease varied between 2 and 18 years, with a mean age of onset of 10.07 ± 4.53 years. Repigmentation rate of >75% was detected in 45.4% of cases.

Conclusion: Nb UVB phototherapy seems to be a well-tolerated effective and safe treatment option in children, especially those unresponsive to topical treatment and those with widespread lesions. However, long-term risks such as photocarcinogenesis and photoaging should kept in mind.

Key words: Pediatric, narrowband UVB, phototherapy, vitiligo

1. Introduction

Vitiligo is an idiopathic and autoinflammatory disease of the skin affecting 1% of the population, characterized by depigmented macules and patches. The disorder generally manifests in childhood and young adulthood with almost half of the patients reported to be less than 20 years of age (1). Although various topical and systemic agents have been used in the treatment of the disease, no consensus has been reached and as of yet there is no curative type of treatment. Phototherapy has been used in many diffuse dermatological diseases unresponsive to topical treatment agents as an alternative to systemic treatment methods, while its use is limited specifically in children due to early skin aging and potential skin cancer risks. Narrowband UVB (Nb UVB) treatment is commonly and successfully used in childhood for the treatment of psoriasis and atopic dermatitis and less frequently in the treatment of vitiligo (2–4). The purpose of this study was to retrospectively evaluate the efficacy and short-term safety of Nb UVB in children diagnosed with vitiligo.

* Correspondence: serkanyazici@uludag.edu.tr

2. Materials and methods

2.1. Patients

Medical records of a total of 26 patients with an age of <18 years who were treated with Nb UVB phototherapy for vitiligo between January 2009 and January 2014 at our clinic were evaluated retrospectively. Age, sex, duration of the disease, presence of family history, comorbidities, skin type, vitiligo subtype, topical treatment the patient had used, duration of Nb UVB treatment, total number of sessions, total cumulative dose, response to treatment, and adverse effects secondary to the treatment were recorded. Lesions were grouped as generalized, focal, and acrofacial according to the Fitzpatrick classification (5).

2.2. Phototherapy protocol

Written informed consent was obtained from all parents and standard phototherapy precautions were taken in all cases; eyes were covered and the genitals were protected. A Daavlin cabin (Daavlin, Bryan, OH, USA) with a Philips TL-01/100W fluorescent light (Philips Company, Eindhoven, the Netherlands) was used as the phototherapy source. The Nb UVB treatment was administered twice

weekly. The initial irradiation dose was defined according to skin type (1: 75 mJ/cm^2; 2: 100 mJ/cm^2; 3: 150 mJ/cm^2) and was increased by 10% in each session according to the erythema response; the total number of sessions was determined according to the clinical response.

2.3. Treatment response

Clinical response was evaluated according to the repigmentation in the lesions. The response was accepted to be good, intermediate, and weak when the percentage of repigmentation was ≥75%, 25%–74%, and <24%, respectively. Patients with no pigmentation despite treatment and those with newly arising lesions were accepted as unresponsive (6).

2.4. Statistical analysis

SPSS 20.0 for Windows was used for statistical analysis. Data were summarized and organized into tables and analyzed using descriptive statistics, given as mean ± standard deviation, median, minimum, maximum, and percentages.

3. Results

Clinical demographic properties of the patients and parameters of the treatment are summarized in Table 1. The 26 children included 14 females and 12 males who received Nb UVB treatment. The age when the disorder started varied between 2 and 18 years with a mean age at onset of 10.07 ± 4.53 years. The duration of the disease prior to Nb UVB varied between 6 months and 10 years with a mean length of 3.15 ± 2.86 years. According to the Fitzpatrick classification, 20 patients had skin type 2 (76.9%), four had skin type 1, and three had skin type 3. The most commonly seen subtype of vitiligo was generalized vitiligo in 16 (61.5%) of the cases, and the remaining subtypes were focal vitiligo in four and acrofacial vitiligo in six cases. There was no patient with segmental vitiligo. Three of the 26 patients had presence of the thyroid antibody alone, and three had thyroid hormone disorder. Twenty patients had no thyroid disease. Folic acid deficiency, vitamin B12 deficiency, low hemoglobin, and ferritin deficiency accompanied the diagnoses in two, one, three, and two cases, respectively. All patients had used topical treatment agents prior to Nb UVB phototherapy. Topical steroids alone; topical steroids and topical calcipotriol; topical steroids and topical immunomodulator treatment; topical steroids, topical calcipotriol, and topical immunomodulator treatment; and cosmetic creams were used in six, three, six, four, and seven cases, respectively. Five of 26 patients dropped out of the treatment of their own will, while 19 completed the treatment according to the response and two patients are still continuing the treatment course. The number of sessions of the 19 patients who completed the treatment course varied between 13 and 163 with a mean number of sessions of 83.36 ± 47.6. The lowest, greatest, and mean cumulative dose was 5.21 J/cm^2, 100.52 J/cm^2, and 34.66 ± 28.13 J/cm^2. Nine of the patients responded well (47.36%), while four responded intermediately and four weakly. Two patients were accepted as unresponsive. No serious adverse effects were detected in all but one patient, who had mild erythema.

4. Discussion

Many types of noncurative treatment have been used in the management of vitiligo. Topical steroids are inexpensive, easy to apply, and may be effective in cases of limited involvement; however long-term use of steroids is not recommended due to the risk of skin atrophy (7,8). Topical calcipotriol, on the other hand, has been suggested as an alternative to potent steroids, rather than its solo use (8). Oral psoralen plus ultraviolet A (PUVA) treatment is not recommended in children under 12 years of age due to its phototoxicity risk (9). Topical PUVA may be used in children with an involvement of less than 20% of the body surface and is a safe method of treatment (10).

Use of Nb UVB phototherapy was first reported in the management of vitiligo in 1997 and it was found to be superior to topical PUVA treatment (11). Njoo et al. reported Nb UVB use in children to be an efficient and safe method (12). Later on, in 2005, Kanwar et al. (13) and Brazzelli et al. (6) reported their experiences with Nb UVB use in pediatric patients with vitiligo, and Ersoy-Evans et al. (2) and Sen et al. (3) from Turkey reported their own experiences with the use of Nb UVB phototherapy in pediatric patients. A comparison of our results with the results of other studies is given in Table 2. The rate of repigmentation of 75% (47.36%) was compatible with the rates of repigmentation reported in the studies of Njoo et al. (12) and Brazzelli et al. (6). The repigmentation rate was found to be higher in the present study in spite of the lower cumulative dose, different from the results in the study by Percivalle et al., who found a repigmentation rate of 14.3% in spite of a higher cumulative dose (14). Although the duration of treatment was long, the reason for the lower cumulative dose may be due to continuous dose reduction and thus inadequate dose increases were secondary to the incompatibility of the patients to treatment. In the literature, complete and good response rates (>75% repigmentation) in pediatric cases with vitiligo have been reported to vary between 14.3% and 75%. This rate was found to be 47.36% in the present case series. No side effects were observed, except in one patient who had reversible erythema of the chin.

In conclusion, our study suggests that Nb UVB phototherapy seems to be a well-tolerated, effective, and safe method of treatment in the short term for pediatric patients, especially patients unresponsive to topical agents or with diffuse lesions. However, its long-term potential risks, such as photocarcinogenesis and photoaging, should be kept in mind while planning treatment.

Table 1. Clinical demographics of the patients and parameters of treatment.

Parameter	n, %
n, total	26
♀/♂	14/12
Age at onset of disease (years)	
Mean ± SD	10.07 ± 4.53
Duration of disease prior to Nb UVB (years) Mean ± SD	 3.15 ± 2.86
Skin type	
1	4
2	20, 76.9
3	3
Vitiligo type	
Generalized	16, 61.5
Focal	4
Segmental	-
Acrofacial	6
Thyroid function disorder	
Hashimoto thyroiditis	3
Hyperthyroidism	3
Hematological disorder None	 20
Folate deficiency	2
Low hemoglobin Vitamin B12 deficiency	3 1
Low ferritin	2
Prior treatment	
TS + calcipotriol TS	3 6
TS + TI + calcipotriol TS + TI	4 6
Cream with vitamin content	7
Nb UVB treatment	
Completed treatment Receiving treatment	19 2
Dropped out Number of Nb UVB sessions (patients completing the treatment = 19) Mean ± SD Median; min, max	5 83.36 ± 47.6 87.0; 13, 163
Cumulative dose (J/cm^2)	
Mean ± SD	34.66 ± 28.13
Median; min, max	30.90 ± 5.2, 100
Clinical response (n = 11) Good response (≥75)	 9, 47.36
Intermediate response	4
No response Poor response	2 4

TS, Topical steroids; TI, topical immunomodulator; SD, standard deviation.

Table 2. Literature search of Nb UVB treatments in pediatric cases of vitiligo.

Characteristics	Njoo et al. (12)	Kanwar and Dogra (13)	Brazzelli et al. (6)	Ersoy-Evans et al. (2)	Percivalle et al. (14)	Sen et al. (3)	This study
Year	2000	2005	2005	2008	2008	2015	2016
n	51	20	10	9	28	36	26
Sex, F/M	31/20	13/7	4/6	?	20/8	20/16	14/12
Mean age (min to max)	9.9 (4 to 16)	(5 to 14)	9.7 (6 to 14)	10.6 ± 3.3	10.1 (3 to 15)	12.5 ± 3.5	10.07 ± 4.53
Duration of disease	4	1.63	3.15	-	2.96	-	3.15
Sessions/week	2	3	2	3	2	3	2
Duration of treatment	11.1 ± 2.0	12	5.6	8.5 ± 5.8	10 ± 3.4	-	14.26 ± 8.78
Number of sessions	78.3 ± 19.9	-	49.33	14 (9 to 107)	62.5 ± 20	125.4 ± 59.5	83.36 ± 47.6
Cumulative dose (J/cm^2)	91.3 ± 46.6	39.7 ± 12.3	51.6	70 (9–301)	156.1 ± 79.4	231.9 ± 140.1	34.66 ± 28.13
Repigmentation (>75%)	27 (53%)	15 (75%)	5 (50%)	4 (50%)*	4 (14.3%)	16 (44.5%)	9 (47.36%)

*Repigmentation of >50%.

References

1. Halder RM. Childhood vitiligo. Clin Dermatol 1997; 15: 899-906.
2. Ersoy-Evans S, Altaykan A, Şahin S, Kölemen F. Phototherapy in childhood. Pediatr Dermatol 2008; 25: 599-605.
3. Sen BB, Rifaioglu EN, Ekiz O, Sen T, Celik E, Dogramaci AC. Narrow-band ultraviolet B phototherapy in childhood. Cutan Ocul Toxicol 2014; 33: 189-191.
4. Tan E, Lim D, Rademaker M. Narrowband UVB phototherapy in children: a New Zealand experience. Australas J Dermatol 2010; 51: 268-273.
5. Ezzedine K, Lim HW, Suzuki T, Katayama I, Hamzavi I, Lan CC, Goh BK, Anbar T, Silva de Castro C, Lee AY, et al. Vitiligo Global Issue Consensus Conference Panelists. Revised classification/nomenclature of vitiligo and related issues: the Vitiligo Global Issues Consensus Conference. Pigment Cell Melanoma Res 2012; 25: E1-13.
6. Brazzelli V, Prestinari F, Castello M, Bellani E, Roveda E, Barbagallo T, Borroni G. Useful treatment of vitiligo in 10 children with UVB narrowband (311 nm). Pediatr Dermatol 2005; 22: 257-261.
7. Lerner AB. Vitiligo. J Invest Dermatol 1959; 32: 285.
8. Gawkrodger DJ, Ormerod AD, Shaw L, Mauri-Sole I, Whitton ME, Watts MJ, Anstey AV, Ingham J, Young K; Therapy Guidelines and Audit Subcommittee et al. Guideline for the diagnosis and management of vitiligo. Br J Dermatol 2008; 159: 1051-1076.
9. Drake LA, Dinehart SM, Farmer ER, Goltz RW, Graham GF, Hordinsky MK, Lewis CW, Pariser DM, Skouge JW, Turner ML et al. Guidelines of care for vitiligo. J Am Acad Dermatol 1996; 35: 620-626.
10. Halder RM. Topical PUVA therapy for vitiligo. Dermatol Nursing 1991; 3: 178-180.
11. Westerhof W, Nieuweboer-Krobotova L. Treatment of vitiligo with UVB radiation versus topical psoralen plus UVA. Arch Dermatol 1997; 133: 1525-1528.
12. Njoo MD, Bos JD, Westerhof W. Treatment of generalized vitiligo in children with narrowband (TL-01) UVB radiation therapy. J Am Acad Dermatol 2000; 42: 245-253.
13. Kanwar AJ, Dogra S. Narrowband UVB for the treatment of generalized vitiligo in children. Clin Exp Dermatol 2005: 30; 332-336.
14. Percivalle S, Piccino R, Caccialanza M, Forti S. Narrowband UVB phototherapy in vitiligo: evaluation of results in 53 patients. G Ital Dermatol Venereol 2008; 143: 9-14.