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Evaluation of Long Term Prognosis in Patients Treated with Narrowband Ultraviolet B: A Retrospective Study for 8 Years

Dar-Band Ultraviyole B ile Tedavi Edilen Hastalarda Uzun Dönem Prognozun Değerlendirilmesi: 8 Yıllık Retrospektif Bir Çalışma

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ABSTRACT Objective: Narrow-band ultraviolet B (NB-UVB) is a proven treatment modality in the management of psoriasis, inflammatory skin diseases and pigmentation disorders. However, recurrence is an important problem both for the patient and the clinician. The long-term effects of narrow-band ultraviolet B treatment on different dermatological indications cause concern. The aim of this study is to evaluate the effectiveness and the recurrence rates of the NB-UVB treatment in several dermatological diseases. **Material and Methods:** A total of 126 patients aged 18 years or older who received narrow-band ultraviolet B treatment due to various indications were included in the study. Treatment response and recurrence rates were retrospectively evaluated and compared in different disease groups. In addition, a statistical comparison was made between the recurrent and non-recurrent groups in terms of some variables that might affect relapse. **Results:** Complete remission, partial remission and unresponsiveness were detected in 74.6%, 13.5% and 11.9% of the patients respectively. The mean follow up period was 27.3±23.8 months. Recurrence was observed in 46.8% of patients with complete remission. Of the patients who developed recurrence, 59.1% had psoriasis, 13.6% mycosis fungoides, 13.6% atopic dermatitis, 6.8% vitiligo and 6.8% idiopathic pruritus. **Conclusion:** Based on our study findings, narrow-band ultraviolet B treatment may reduce the relapse rate in all dermatoses when scheduled in the early period. In addition to its widespread use in the treatment of psoriasis, it would be beneficial to consider narrow-band ultraviolet B as an effective treatment method in patients with idiopathic pruritus in the long-term period.

Keywords: Ultraviolet therapy; recurrence

ÖZET Amaç: Dar band ultraviyole B başta psoriasis, inflamatuvar deri hastalıkları ve pigmentasyon bozukluklarının tedavisinde etkinliği kanıtlanmış bir tedavi yöntemidir. Bununla birlikte hem hasta hem klinisyen için nüks bir sorun olup, farklı dermatolojik endikasyonlarda dar band ultraviyole B tedavisinin uzun dönem etkileri merak konusudur. Bu çalışmanın amacı çeşitli dermatolojik hastalıklarda dar band ultraviyole B tedavisinin etkinliğinin ve nüks oranlarının değerlendirilmesi amaçlanmıştır. **Gereç ve Yöntemler:** Bu çalışmaya kliniğimizde çeşitli tanılarla dar band ultraviyole B tedavisi almış 18 yaş üstü 126 hasta dahil edildi. Tedavi yanıtı ve nüks farklı hastalıklarda retrospektif olarak değerlendirildi ve karşılaştırıldı. Ayrıca nüks olan ve olmayan gruplar arasında nüksü etkileyebilecek bazı değişkenler açısından istatistiksel karşılaştırma yapıldı. **Bulgular:** Hastaların %74,6' ünde komplet remisyon, %13,5'ünde parsiyel remisyon %11,9' unda tedaviye yanıtsızlık saptandı. Ortalama takip süresi 27,29±23,8 aydı. Komplet remisyondaki hastaların %46,8'inde nüks mevcuttu. Nüks gelişen hastaların %59,1'i psoriasis %13,6'sı mikozis fungoides, %13,6'sı atopik dermatit, %6,8'i vitiligo ve %6,8'i idyopatik pruritus idi. **Sonuç:** Çalışma bulgularımız ışığında dar band ultraviyole B tedavisinin tüm dermatozlarda erken dönemde planlanması relaps oranını azaltabilecektir düşüncesindeyiz. Ayrıca psoriasis tedavisinde yaygın kullanımının yanı sıra, dar band ultraviyole B'nin idyopatik prurituslu hastalarda da uzun dönemde etkin bir tedavi ajanı olarak göz önünde bulundurulması faydalı olacaktır.

Anahtar Kelimeler: Ultraviyole tedavisi; nüks

Narrowband ultraviolet B (NB-UVB) has been used for many years as a safe treatment method in the treatment of inflammatory diseases as atopic dermatitis, psoriasis, mycosis fungoides (MF), polymorphous light eruption and pigmentation disorders such as vitiligo.[1] Although its effectiveness in the management of all these dermatoses has been shown

in many studies, the long-term effects of NB-UVB as well as the factors which may affect recurrence and in which dermatoses it can provide persistent remission are still controversial. Its effectiveness in the treatment of psoriasis has been specifically known for a long time. In daily practice, however, most patients experience recurrence. In recent years, studies on the effectiveness of NB-UVB in the treatment of pruritus other than psoriasis have mostly included uremic patients, and there have been limited publications on its effectiveness in patients with idiopathic pruritus.[2,3] In this study, we aimed to evaluate the effectiveness of the DB-UVB treatment retrospectively in patients who have received this treatment in our dermatology outpatient clinic and to evaluate the recurrence rate.

MATERIAL AND METHODS

Ethics committee approval was obtained from Ufuk University Faculty of Medicine (decision date:01/11/2017 and number: 20171101-7) and consent of the patients were obtained prior to the study. This study was conducted in accordance with the Declaration of Helsinki. The medical records of the patients over 18 years of age who had been treated with NB-UVB in WALDMAN® UV 7002 light cabinet (UV therapy System, Herbert Waldmann, Germany) between 2009 and 2017 in our dermatology outpatient clinic were evaluated retrospectively. A total of 400 patients who met inclusion criteria were identified. Complete medical data of 300 patients were available. Among these 300 patients, 126 patients who were evaluated in the outpatient clinic for treatment effectiveness and recurrence during the follow up period were included in our study. The patients who received NB-UVB for at least 4 sessions with the diagnosis of extensive psoriasis unresponsive to topical treatments, extensive vitiligo, MF at stages of 1a/1b according to the National Cancer Institute Classification, generalized pruritus unresponsive to topical treatment agents without any etiologic cause and patients with dermatological diseases having NB-UVB indication were included in the study. Patients with contraindications for the treatment of NB-UVB, patients without available past medical records, those who discontinued treatment or were lost during follow up for recurrence after the treatment were excluded from the study. The demographic characteristics, initial and total cumulative doses and the number of sessions were noted. After approval for treatment had been obtained, all patients underwent a thorough ophthalmologic examination before phototherapy. All patients used ultraviolet protection glasses during the procedure. The initial doses of therapy varied regarding the clinical diagnosis which was determined according to the skin type. The dose was increased by 20% at each session unless erythema developed. In case of mild-to-moderate erythema, the same dose was maintained. In the case of severe erythema, the treatment was interrupted and after the reaction had regressed, the treatment was resumed with the dose reduction by 10%. Patients received NB-UVB treatment 3 times a week intermittently. The treatment effectiveness was considered as "complete remission" with a 75% or more regression in the extent of lesions in vitiligo, atopic dermatitis and psoriasis patients, 50%-to-75% regression was considered as "partial remission", and less than 50% remission was defined as "non-responsive to treatment". Patients with pruritus were considered as "complete remission" if they had no itching for the last week, patients with 50%-to-75% decrease in itching symptom were considered in "partial remission" group and those with less than 50% remission in itching were considered as "unresponsive to treatment". The medical records of the patients who were followed in the outpatient clinic after the end of the treatment were evaluated in terms of recurrence. For all dermatoses, the occurrence of new lesions in more than 50% of the whole body in cleansed areas and the relapse of the generalized pruritus following improvement with a 75% increase pruritus during at least one week compared to baseline itching symptom was defined as "relapse". Treatment effectiveness and recurrence were compared between the disease groups. Also, some variables that could affect recurrence were compared between the recurrent and non-recurrent groups.

STATISTICAL ANALYSIS

Descriptive statistics were given as frequency (%) for categorical variables and as mean ± standard deviation or median (minimum-maximum) for continuous variables. Chi-Square Test or Fisher's Exact Test was used to compare groups regarding categorical variables. We have tested the difference between recurrent and non-recurrent groups in terms of numerical variables with the Mann-Whitney U Test since the data did not fit the normal distribution. We used the Kruskal-Wallis Test for the analysis of the difference between diagnostic groups in terms of numerical variables.

RESULTS

Of the 126 patients included in the study, 70 (55.6%) were male and 56 (44.4%) were female. The mean age of the patients was 49.6±18.3 years. The mean duration of complaints was 13.67±12.93 months. The mean initial dose was 0.20±0.12 J/cm^2, and the mean total cumulative dose was 25.22±36.99 J/cm^2. 66% of the patients had no history of systemic disease. 46% of the patients did not use any other treatment before the NB-UVB while 54% did not benefit from the various past therapies. Demographic and descriptive data of the patients are shown in Table 1. While 63.5% of the patients received NB-UVB treatment alone, 36.5% were receiving combined therapies with NB-UVB (19 of them were using topical corticosteroids, 8 of them used topical corticosteroids & systemic antihistamins, 9 of them used cignolin, and 5 of them used topical calcineurin inhibitor). None of the patients developed side effects that required discontinuation of treatment. Patients who achieved remission did not use maintenance therapy other than emollient after the discontinuation of NB-UVB therapy. When the treatment response of the patients was examined, "complete remission" was detected in 94 patients (74.6%), "partial remission" in 17 patients (13.5%) and "unresponsiveness to treatment" in 15 patients (11.9%). While there was a statistically significant difference in the mean age between the patients in complete remission group, partial remission group and non-responsive group (p=0.01), there was no statistically significant difference between the three groups in terms of symptom duration, number of sessions, total cumulative dose, initial dose, gender, localization of lesion and presence of concomitant treatment (Table 2). Forty four (46.8%) of 94 patients in complete remission group had experienced recurrence. Of 44 patients who had experienced a recurrence, 59.1% had the diagnosis of psoriasis, 13.6% had MF, 13.6% had atopic dermatitis, 6.8% had vitiligo, and 6.8% had idiopathic pruritus (Table 3). There was no recurrence in other diagnostic groups. There was a statistically significant difference between the diagnostic groups in terms of recurrence and treatment response (Table 3). The mean follow

TABLE 1: Demographic characteristics and descriptive data of the patients.

	(%)
Gender	
Male	70 (55.6)
Female	56 (44.4)
Skin type	
1	6 (4.8)
2	46 (36.5)
3	62 (49.2)
4	12 (9.5)
Symptom duration	
<6 months	13 (10.3)
6 months-1 year	17 (13.5)
1 year-5 years	40 (31.8)
>5 years	56 (44.4)
Lesion localization	
Trunk	16 (12.7)
Extremities	24 (19.0)
Trunk+ Extremities	52 (41.2)
Whole body	21 (16.6)
Others	13 (10.5)
Diagnosis	
Psoriasis	45 (35.7)
Vitiligo	11 (8.8)
MF/Parapsoriasis	13 (10.3)
Pruritus	29 (23.0)
Atopic Dermatitis	13 (10.3)
Others (pityriasis rubra pilaris, pityriasis lichenoides chronica, polymorphous light eruption, Darier disease, lichen planus)	15 (11.9)

TABLE 2: Comparison of numerical and categorical variables among complete remission, partial remission and non-responsive groups.

	Mean±SD	Median (Minimum–Maximum)	Mean±SD	Median (Minimum–Maximum)	Mean±SD	Median (Minimum-Maximum)	p
Age (years)	41.65±18.47	39.00 (18.00-71.00)	49.47±17.85	47.00 (18.00-92.00)	59.53±17.52	65.00 (28.00-85.00)	**0.019**
Total number of sessions	40.00±23.76	35.00 (10.00-102.00)	30.61±22.12	27.00 (5.00-137.00)	33.87±18.17	33.00 (4.00-74.00)	0.108
Symptom duration (months)	60.71±79.37	24 (5-300)	77.85±99.21	27 (1-284)	204.53±219.81	(2-588)	0.143
Initial dose	0.19±0.17	0.15 (0.03-0.72)	0.20±0.12	0.15 (0.03-1)	0.17±0.06	0.15 (0.1-0.3)	0.469
Total cumulative dose	31.06±35.72	15.20 (4.11-140.23)	23.56±35.45	11.43 (0.27-224.10)	28.98±48.29	14.34 (1.32-193.33)	0.316
	Partial remission (n=17)		**Complete remission (n=94)**		**Unresponsive (n=15)**		**p**
Gender							0.589
Male		6 (10.7)		42 (75.0)		8 (14.3)	
Female		11 (15.7)		52 (74.3)		7 (10.0)	
Symptom duration <6 ay				11 (84.6)		1 (7.7)	0.347
6 ay-1 yıl		1 (7.7)		14 (82.4)		1 (5.9)	
1 yıl-5 yıl		2 (11.8)		30 (75.0)		2 (5.0)	
>5 yıl		8 (20.0)		39 (69.6)		11 (19.6)	
		6 (10.7)					
Accompanying treatment				48 (68.6)		11 (15.7)	0.195
Yes		11 (15.7)		46 (82.1)		4 (7.1)	
No		6 (10.7)					
Lesion localization				12 (75.0)		1 (6.2)	0.203
Trunk Extremities		3 (18,8)		18 (75.0)		3 (12.5)	
Trunk+extremities		3 (12.5)		39 (75.5)		5 (9.6)	
Total body Other		8 (15.4)		19 (90.5)		2 (9.5)	
		0 (0.0)		6 (46.2)		4 (30.8)	
		3 (23.1)					

SD: Standard deviation.

up duration was 27.3±23.8 months and the mean time to recurrence was 13.7±12.9 months. While there was no statistically significant difference between the diagnostic groups in terms of mean follow up duration and time to recurrence development (p=0.085 and p=0.509, respectively), there was a statistically significant difference in age, symptom duration, initial dose, total cumulative dose, number of sessions and gender (p=0.010, p= 0.001, p <0.001, and p <0.001, respectively) (Table 4). There was no statistically significant difference between the recurrent and non-recurrent groups in terms of age, gender, number of sessions (p= 0.765, p= 0.33, and p= 0.137, respectively) whereas there was a statistically significant difference in terms of symptom duration, initial dose, total cumulative dose and lesion localization between the groups (p<0.001, p= 0.009, p= 0.001, and p= 0.048, respectively) (Table 5). In psoriasis patients, the symptom duration was significantly longer in the recurrent group compared to the non-recurrent group (χ^2, p <0.001).

DISCUSSION

Nowadays, NB-UVB has taken its place as one of the first-choice treatment modalities in the treatment of many dermatoses with its non-specific immunomodulatory effects and a lower side effect profile than other treatment agents.[4] On the other hand, the response to NB-UVB treatment and the duration of remission may vary depending on many factors such as patient age, combination therapies, the duration and severity of the disease. In this study, the mean age of the patients who were "unre-

TABLE 3: Comparison of diagnostic groups in terms of treatment response, recurrence and categorical variables.

	Psoriasis	Vitiligo	Mycosis fungoides/Parapsoriasis	Idiopathic pruritus	Atopic dermatitis	Others	
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	p
Gender							
Male	25 (44.6)	4 (7.1)	8 (14.3)	7 (12.5)	8 (14.3)	4(7.1)	**0.030**
Female	20 (28.6)	7 (10.0)	5 (7.1)	22 (31.4)	5 (7.1)	11(15.7)	
Accompanying treatment							
Yes	27 (38.6)	5 (7.1)	8 (11.4)	15 (21.4)	9 (12.9)	6(8.6)	0.604
No	18 (32.1)	6 (10.7)	5 (8.9)	14 (25.0)	4 (7.1)	9 (16.1)	
Lesion localization							
Trunk	2 (12.5)	3 (18.8)	8 (50.0)	2 (12.5)	0 (0.0)	1 (6.2)	**<0.001**
Extremities	8 (33.3)	3 (12.5)	0 (0.0)	9 (37.5)	1 (4.2)	3 (12.5)	
Trunk+extremities	18 (34.6)	3 (5.8)	5 (9.6)	8 (15.4)	10 (19.2)	8 (15.4)	
Total body	10 (47.6)	0 (0.0)	0 (0.0)	9 (42.9)	0 (0.0)	2 (9.5)	
Other	7 (53.8)	2 (15.4)	0 (0.0)	1 (7.7)	2 (15.4)	1 (7.7)	
Treatment response							
PR	2 (11.8)	6 (35.3)	2 (11.8)	3 (17.6)	3 (17.6)	1 (5.9)	**0.004**
CR	37 (39.3)	5 (5.3)	11 (11.7)	23 (24.5)	9 (9.6)	9 (9.6)	
TF	6 (40.0)	0 (0.0)	0 (0.0)	3 (20.0)	1(6.7)	5 (33.3)	
Recurrence (n=94)							
Yes	26 (59.1)	3 (6.8)	6 (13.6)	3 (6.8)	6 (13.6)	0 (0.0)	**<0.001**
No	11 (22.0)	2 (4.0)	5 (10.0)	20 (40.0)	3 (6.0)	9 (18.0)	

PR: partial remission; CR: complete remission; TF: treatment failure.

sponsive" to NB-UVB treatment was more advanced. Structural and physiological alterations in the skin of elderly patients may be associated with a decrease in treatment response together with decreased photo adaptation and physical and cognitive decline with advanced age.[5] According to our results, the disease duration is longer in patients of recurrent group and recurrence was more frequent in chronic cases. Similarly, in a study conducted with psoriatic patients, the duration of disease was found as the only factor associated with remission.[6] In this respect, we think that early initiation of NB-UVB treatment may reduce the relapse rate in many dermatoses.

Surprisingly, patients with low total cumulative doses had less relapse rate in our study. This finding may be explained by the fact that the cases with recurrence have more severe and resistant disease and require more aggressive treatment. In our study, patients had well-tolerated NB-UVB treatment and clinically responded well. Complete remission was achieved in 74.6% of the patients. However, we observed recurrence in almost half of these patients (44 patients). When we evaluated the diagnoses of the patients who experienced recurrence, the most frequent recurrence was observed in psoriatic patients while the least fre-

TABLE 4: Comparison of diagnostic groups in terms of numerical variables.

	Psoriasis (n=45)		Vitiligo (n=11)		Mycosis fungoides/Parapsoriasis (n=13)		Pruritus (n=29)		Atopik dermatitis (n=13)		Others (n=15)	
	Mean±SD	Median (Min–Max)	Mean±SD	Median (Min–Max)	Mean±SD	Median (Min–Max)	Mean±SD	Median (Min–Max)	Mean±SD	Median (Min–Max)	Median (Min–Max)	p
Age (years)	47,33 ±16,03	44,00 (18,00-82,00)	41,09 ±17,37	35,00 (18,00-68,00)	60,38±18,70	29,00 (27,00-92,00)	57,52 ±16,60	28,00 (30,00-85,00)	40,15 ±21,90	31,00 (18,00-72,00)	41,00 (18,00-71,00)	**0,010**
Symptom duration (months)	13,73 ±12,39	10,00 (3,00-40,00)	17,00 ±17,35	8,00 (6,00-37,00)	20,40 ±22,29	12,00 (6,00-60,00)	11,33 ±1,15	12,00 (10,00-12,00)	7,33 ±3,78	6,00 (3,00-12,00)	26,33 ±12,09	23,00 (14,00-60,00)	**0,001**
Initial dose (J/cm²)	0,24 ±0,08	0,20 (0,10-0,40)	0,17 ±0,16	0,15 (0,03-0,60)	0,17±0,07	0,15 (0,10-0,30)	0,20 ±0,19	0,15 (0,10-1,00)	0,16 ±0,10	0,15 (0,10-0,50)	0,14±0,04	0,15 (0,10-0,22)	**<0,001**
Total cumulative dose (J/cm²)	27,56 ±35,65	16,16 (0,88-193,33)	79,24 ±75,63	56,42 (5,22-224,10)	34,66 ±23,55	37,83 (1,78-75,99)	9,64 ±7,93	7,78 (1,54-31,27)	13,17±6,68	14,88 (2,26-23,75)	10,95 ±15,69	4,80 (0,27-64,41)	**<0,001**
Total number of sessions	27,49 ±17,49	23,00 (4,00-74,00)	71,00 ±32,00	65,00 (35,00-137,00)	42,85 ±23,47	36,00 (10,00-101,00)	23,14 ±12,18	21,00 (8,00-52,00)	32,62 ±13,02	33,00 (15,00-59,00)	26,33 ±12,09	23,00 (14,00-60,00)	**<0,001**
Follow up duration (months)	23,28 ±22,70	12,00 (3,00-85,00)	31,80 ±31,80	24,00 (6,00-84,00)	27,56 ±24,67	12,00 (6,00-60,00)	37,23 ±23,31	33,00 (7,00-80,00)	14,67 ±13,97	12,00 (3,00-48,00)	28,89±27,84	20,00 (5,00-72,00)	0,085
Recurrence duration (months)	13,73 ±12,39	10,00 (3,00-40,00)	17,00 ±17,35	8,00 (6,00-37,00)	20,40 ±22,29	12,00 (6,00-60,00)	11,33±1,15	12,00 (10,00-12,00)	7,33 ±3,78	6,00 (3,00-12,00)			0,509

J: Joule

quent recurrence occurred in patients with recurrent idiopathic pruritus, vitiligo, and other diagnoses (Table 3). On the other hand, when the rate of recurrence development was evaluated in dermatoses, 70.3% of patients with psoriasis, 60% of vitiligo patients, 54.5% of MF/parapsoriasis patients and 50% of atopic dermatitis patients had a recurrence whereas recurrence was observed in only 13% of idiopathic pruritus patients. In a retrospective study evaluating the duration of remission in patients with psoriasis, after a NB-UVB treatment of 5 days per week, a remission period of 6 months or less was reported in 33% of the patients, 6-12 months remission period in 33% of the patients, and a remission period of longer than 12 months was reported in 35% of the patients.[7] In our study, 27% of 37 psoriasis patients with complete remission had a remission duration less than six months, 8% had 6-12 months of remission duration, and 65% of patients had longer than 12 months of remission. In contrast to the study of Karakawa et al., though our phototherapy protocol was three days per week in our study, the rate of our patients with remission duration longer than 12 months was higher.[7] In another study conducted with 63 patients with psoriasis, 57% of them had a 75-89% improvement in PASI score, and the disease duration was reported as the only factor affecting the treatment response.[6] In our study, the fact that the disease duration was significantly higher in the recurrent group compared to the non-recurrent group ($p<0.001$) also supported this finding. In a retrospective study that investigated the efficacy and safety of NB-UVB therapy in patients with vitiligo, psoriasis vulgaris, lower complete response rates were reported than the present study (6.5% in vitiligo and 8.5% in psoriasis).[8] However in that study complete remission was defined as regression of more than 90% of lesions which may be related to low treatment response.

In the literature, limited studies are evaluating the effectiveness of NB-UVB therapy

TABLE 5: Comparison of numerical and categorical variables between recurrent and non-recurrent groups.

	Recurrence (+) (n=44)		Recurrence (-) (n=50)		P
	Mean±SD	Median (Min–Max)	Mean±SD	Median (Min–Max)	
Age, years	49.30±19.02	49.00 (18.00-92.00)	49.62±16.95	46 (18,00-78,00)	0,765
Symptom duration, months	129.48±109.79	90.00 (2.00-384.00)	32.41±60.04	12 (1,00-360,00)	**<0,001**
Total number of sessions	34.55±24.89	29.50 (5.00-17.00)	27.14±18.94	21,5 (60,00-101,00)	0,136
Initial dose	0.21±0.08	0.20 (0.03-0.40)	0.19±0.15	0,15 (0,10-1,0)	**0,009**
Total cumulative dose	31.93±3 9.95	17.87 (0.88-224.10)	16.20±29.44	8,48 (0,27-188,54)	**0,001**
	Recurrence (+) n(%)		Recurrence (-) n(%)		P
Sex					
Male	22(52.4)		20(47.6)		0.331
Female	22(42.3)		30(57.7)		
Symptom duration					
<6 months	3(27.3)		8(72.7)		**<0.001**
6 months – 1 year	1(7.1)		13(92.9)		
1 years – 5 years	10(33.3)		20(66.7)		
>5 years	30(76.9)		9(23.1)		
Lesion localization					
Trunk	3(25.0)		9(75.0)		**0.048**
Extremities	5(27.8)		13(72.2)		
Trunk+extremities	22(56.4)		17(43.6)		
Whole body	9(47.4)		10(52.6)		
Others	5(83.3)		1(16.7)		

SD: Standard Deviation; Min: Minimum; Max: Maximum.

in patients with idiopathic pruritus. In a study assessing the recurrence, 17 patients achieved complete remission with NB-UVB treatment, and 13 of them were followed up during a mean of 6 months; 5 out of these 13 patients had experienced a relapse during the follow up period.[9] In this study, patients with idiopathic pruritus had a higher rate of remission (61%) within six months after treatment compared to the patients with uremic pruritus. In our study, we detected recurrence in only 3 of 23 cases with idiopathic pruritus. We think that our results were different from those of the study by Seckin et al. because the mean disease duration was longer (89 months) and the recurrence rate was higher in their study compared to ours. In the literature, NB-UVB therapy has been reported to be effective and reliable in vitiligo patients. It is also discussed that treatment with NB-UVB is more effective and repigmentation is more permanent compared to PUVA.[9-13] In a long-term follow up study, 17 vitiligo patients underwent NB-UVB as monotherapy, and complete remission had been detected in 10 patients at the end of the 1st year of therapy while mild-to-moderate repigmentation was observed in 2 patients. The best treatment response has been reported in the proximal extremity following the face and neck in cases with vitiligo. In this study, only 8 patients were followed up for six months. Depigmentation was reported in 2 patients with complete remission and in 3 patients with moderate remission in a smaller area at the 2nd and 3rd months of treatment.[13] Scherschun et al. observed more than 75% repigmentation in 5 of 7 vitiligo patients and reported recurrence at the 4th month after cessation of treatment in two of these patients.[14] Although the sample volume was low, we observed relapse in accordance with the literature among vitiligo patients in our study. In the study of Silpa-Archa et al., 52 vitiligo patients were treated with NB-UVB 2-3 times per week for

12 months and the authors reported that repigmentation continued in 80% of the patients at the end of 1st year.[15] In this study, vitiligo type, disease duration, lesion localization, treatment duration and the number of sessions were defined as the factors associated with treatment response. In a 579 vitiligo patient- cohort study, a predictive model of response was described for the first time based on repigmentation rate in the first 48 sessions (very rapid, rapid, average, slow responders, non-responders).[16] It is reported that; 67 patients improved more than 75%, 335 between 25-75% and 177 less than 25% after NB-UVB therapy. Better response was found in the face, neck, trunk and superior limbs.[16] In our study 5 of 11 vitiligo patients improved more than 75% (complete remission). Small sample size of vitiligo group in our study, prevent us to evaluate the repigmentation rate according to number of sessions. Previous studies in the literature on the effectiveness of NB-UVB therapy in the treatment of stage 1a MF included a small number of patients and reported different recurrence rates. In a study with 14 patients, complete remission was observed at a rate of 78.6%, and relapse was reported in 54.5% of these patients which is consistent with our study.[17] In another study, recurrence was observed in 3 of 8 patients, and the extent of lesions in one of these patients was associated with relapse.[18] Ponte et al. reported a higher rate of relapse (83.3%) than that in our study.[19] In the study of Boztepe et al., 11 of 14 MF cases with stage 1a, 1b and 2a had complete clearance.[20] Similarly, 11 of 13 MF patients had complete clearance in the present study. However relapse rate of the present study was higher in MF patients compared to Boztepe al. They also emphasized the benefits of maintenance NB-UVB therapy for the prevention of relapse and reported that eight patients completed maintenance therapy after complete remission.[20] At the end of the follow up period only 2 patients had relapse at 20 and 21 months after complete remission. In the present study, the high recurrence rate in MF patients may be related to the lack of maintenance therapy. Phototherapy is recommended as a second-line treatment in atopic dermatitis patients who are resistant to topical steroids and emollients.[21] In studies evaluating the effectiveness of NB-UVB in adult patients with atopic dermatitis, 60-70% remission rate was reported which is consistent with our results.[22-24] However, long-term effectiveness and relapse rate were not evaluated in these studies. In our study, recurrence developed in 3 of 6 patients during a mean follow up of 14 months. Considering that atopic dermatitis is a chronic disease, we think that the persistence of remission in our 3 patients is an important finding despite our small patient number.

STUDY LIMITATIONS

The fact that we did not use the PASI score in the evaluation of treatment response in psoriasis patients and retrospective design of our study were considered as limitations of our study.

CONCLUSION

Albeit the recurrence rate in our patients with psoriasis was quite high, considering the fact that psoriasis is a chronic dermatological disease which can aggregate due to a number of many factors, NB-UVB can be accepted as a safe treatment modality with low side effect profile, which may reduce the need for topical steroids and can be beneficial in the long-term outcome. Moreover, we detected fewer recurrence rates with shorter duration of treatment (fewer sessions) in patients with idiopathic pruritus than other disease groups and treatment of NB-UVB should be considered as an effective treatment method.

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Conflict of Interest

No conflicts of interest between the authors and/or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Gül Aslıhan Çakır Akay, Dilsun Yıldırım;* ***Design:*** *Gül Aslıhan Çakır Akay, Dilsun Yıldırım;* ***Control/Supervision:*** *Gül Aslıhan Çakır Akay, Fatma Gülru Erdoğan;* ***Data Collection and/or Processing:*** *Gül Aslıhan Çakır Akay, Fatma Gülru Erdoğan;* ***Analysis and/or Interpretation:*** *Gül Aslıhan Çakır Akay, İrem Kar;* ***Literature Review:*** *Gül Aslıhan Çakır Akay, Fatma Gülru Erdoğan, Dilsun Yıldırım;* ***Writing the Article:*** *Gül Aslıhan Çakır Akay, Dilsun Yıldırım;* ***Critical Review:*** *Gül Aslıhan Çakır Akay, Fatma Gülru Erdoğan;* ***References and Fundings:*** *Gül Aslıhan Çakır Akay, Dilsun Yıldırım, Fatma Gülru Erdoğan;* ***Materials:*** *Gül Aslıhan Çakır Akay, Dilsun Yıldırım, Fatma Gülru Erdoğan.*

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