Treatment of Vitiligo Patients with Narrow Band Ultraviolet Light -B and Associated Predictive Factors (A Prospective Interventional Therapeutic Study)

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ABSTRACT:

BACKGROUND:

Vitiligo is a common dermatological disease with a great psychological impact on the life of individual. Narrow band ultraviolet B phototherapy has been used successfully for the treatment of vitiligo with variable results.

OBJECTIVE:

To assess the response to NB UVB and to identify factors that could predict the response to therapy.

Patients and methods:

This study is an interventional prospective therapeutic study, had been conducted in the Department of Dermatology and Venereology - Baghdad Teaching Hospital extending from October 2013 to October 2014.

Thirty two patients with vitiligo were included in the study , the ages ranged from 8- 35 (18.84±7.86) years, 22 (68.8%) females and 10 (31.2%) males, the body surface area of vitiligo ranged from 2- 60%(23.8 ± 16.66), full history and physical examination , assessment of skin phenotype , daily life quality index before and after completing the 48 sessions. Narrow band phototherapy was given twice weekly, recording of the body surface area of vitiligo was done before the treatment and every 16 sessions till the end of 48 sessions. Documentation of the first response session for every patient, calculation of the total percent of reduction , the main predictive factors and the development of any side effect had been recorded.

RESULTS:

First response session ranged from 3- 20 (10^{th} ± 4.37) ,the response of patients according to the degree of regimentation was as the following: 3 (9.37%) patients had excellent response, 6 (18.75%) patients had good response , 14 (43.75%) patients had moderate response and 9 (28.12%) patients had poor response. The age of patients and negative hair involvement had a statistically significant correlation to the total percent of reduction. The face was the area of maximum response , The side effects were tolerable and no patient discontinued the treatment due to the side effects. Daily life quality index showed a statistically significant reduction at the end of treatment.

CONCLUSION:

Narrow band is an effective treatment for vitiligo with few side effects. Age of the patients and absence of hair involvement are favorable predictive features. The face was the area of maximum response.

KEY WORDS: narrow band UVB, vitiligo.

INTRODUCTION:

Vitiligo is a common disease that has a high burden on the life of the individuals.[1] The cost of treatment is considerable.[2] NB-UVB is an established method of treatment especially in generalized vitiligo however multiple sessions with prolonged periods are needed. As there is no satisfactory, short term treatment, many vitiligo patients, though enthusiastic in the beginning, become defaulters after a few weeks or months. [3] Because the treatment is time consuming and highly demanding in terms of personal commitment, a predictive model for clinical response may have the obvious advantages of helping to select likely responders and anticipating treatment duration in individual patients. for this reason this study was designed.[4]

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PATIENTS AND METHODS:

This study is an interventional prospective therapeutic study. It was conducted at the Department of Dermatology and Venereology - Baghdad Teaching Hospital in the period from October 2013 to October 2014.

The ethical written approval was obtained from the Scientific Council of Dermatology and Venereology - Iraqi Board of Medial Specializations.

Sixty patients with vitiligo were included in the study, fifteen of them defaulted; seven because of difficulty in transportation and eight because the treatment interfered with their work. The treatment was stopped in 13 patients after 30 sessions because of no response. The remaining 32 patient completed the 48 sessions of treatment.

Pregnancy, lactation and history of cutaneous photosensitivity, eye cataract or skin cancer were considered as a criteria for exclusion.

Complete history was taken and physical examination was performed, Assessment of Fitzpatrick's skin phototype, and quality of life questionnaire was taken for evaluation of the psychosocial impact of disease and treatment was done using the Dermatology Life Quality Index (DLQI) according to Andrew .[5] It consists of 10 questions regarding the patient's own perceptions of the effects of disease on daily life. Each question is evaluated with a 4 point scale;

0 not at all
1 a little
2 a lot
3 very much

The index was scored before and after termination of therapy. The total score provides a global aggregate value between 0 (no impact) and 30 (maximum impact on quality of life of patient) [5] .

For Narrow-Band UVB Phototherapy the patients were prepared and verbal consent was taken from each patient before trial after a full explanation about the nature , course, duration and complication of treatment. Skin lesions on each sites of the body were photo documented for all patients before therapy and repeated every 16 sessions to evaluate the clinical improvement to therapy.The genital area was protected in all cases, the eye of the patients protected with UVB-blocking goggles. Patients were treated with NB-UVB twice weekly on non consecutive days for a total of 48 sessions (6 months) .

Initial doses was (0.2 j / cm^2) and increments were :

If there was no erythema after starting dose, a 20% increment was used for the next doses, If mild erythema occurred, a decrease to the previous increment was made without further increase for two sessions. If moderate or severe erythema occurred, sessions were stopped until erythema faded then started with 20-50% of the previous dose.

Doses were adjusted according to the maximum erythema occurring at the previous session, determined by patient report and by physical examination.

The NB-UVB treatment were administered in a special cabinet (Amedisun 2800 cabinet containing 44 philips,100-w NB-UVB flurescent tube, by Shultz + Böhm – Germany). Treatment was terminated if there is absence of improvement after 30 sessions.

All vitiliginous lesions were carefully monitored and repeated evaluations for safety and clinical assessment were performed before each session and at end of therapy. Clinical assessment consisted of clinical response determination on each body site, consecutive photographic documentation every 16 sessions and at the end of treatment in a good illumination and same place. The first response session for every patient was recorded. The percentage of reduction in surface area of vitiligo was caluculated .Patients were monitored for repigmentation ; overall and per lesion on the face, trunk, upper & lower extremities. Development of perifollicular pigmentation was assessed as an initial response to therapy.

The clinical response to therapy was visually scored as the percentage of repigmentation of the depigmented lesions and rated as follows [6]

Excellent response: If >75% repigmentation of the depigmented lesions at end of therapy.

Good response: If > 50 -75% repigmentation of the depigmented lesions at end of therapy

Moderate response: If > 25 -50% repigmentation of the depigmented lesions at end of therapy.

Poor response: If ≤ 25% repigmentation of the depigmented lesions at end of therapy.

No response: If 0% repigmentation of the depigmented lesions at end of therapy.

Evaluation of treated areas was also done every visit for side effects as erythema, pruritus and burning sensation. DLQI determination was done at the end of therapy.

Statistical Analysis

Comparison between the treatment groups for discrete data was done by Chi square test and ANOVA. Correlation between two continuous data was done by using Pearson Correlation and between continuous and discrete data was done by using bivariate correlation. P-value < 0.05 was considered as the level of significance. Values for

strength of correlation were interpreted according to Dancey and Reidy.

RESULTS:

Demographic Data: is presented on (Table -1)

BSA- V involved range from 2- 60% with mean± SD of 2.8±16.66.

Patient first response to treatment was noted after the 3rd session in one patient, while one patient needed 20 sessions for the first response to appear. The mean number of sessions for the first response ±SD were10th±4.37 sessions. Thirteen from the 45 (28.8%) patients who complete thirty session in the study had no primary response, so they were excluded from the study and considered as failure to treatment . The percent of reduction in vitiligo surface area ranged between a minimum of 9.52% to a maximum reduction of 83.33% , with a mean ±SD for 32 patient who completed 48 weeks were 38.64±21.42 .Three paients had excellent response(9.37%), 6 patients good response(18.75%) ,14 moderate response(43.75%) and 9 patients poor response(28.12%), (Table -2).

The correlations between percent reduction and other parameters revealed a statistically

significant correlation between the age of patients and percent of reduction (r = 0.474, N = 32, p =0.006). Patients in their thirties were associated with higher levels of total percent reduction than younger patients. (Figure -1).

Correlation was found between hair involvement and response to treatment, the result revealed a statistically significant correlation (r=0.386, p < 0.0287). The response was better with no hair involvement (Figure -2).

Correlation of response with age of onset , type of vitiligo, gender, duration, activity of vitiligo positive family history, history of previous treatment and first response session did not show a statistically significant correlation to the percent of reduction.

The best response occurred on the face , the percent of repigmentation increased from 19.32 at 16 sessions to 38.37 at 32 sessions to reach 54.19 at 48 sessions. The trunk, upper and lower limbs achieved a comparable response.(Figure -3,4).

The mean± SD of DLQI at baseline visit was 19.44±4.65 and at the end of treatment was 14.69±4.15, the reduction was statistically significant (p < 0.001).

Itching was complained of 18 (56.2%) patients, erythema 6 (18.8%) and both of them in 8 (25%) of patients.

Table 1: Demographic data of studied patients.

Patient Age	Mean	18.84	
	SD	7.86	
	Minimum	8	
	Maximum	35	
Age of onset	Mean	10.92	
	SD	6.23	
	Minimum	3.0	
	Maximum	26.0	
Gender	Male	10	31.2%
	Female	22	68.8%
Duration of Disease	≤ one year	5	15.6%
	> 1 year	27	84.4%
Stability of Disease	Stable	12	37.5%
	Active	20	62.5%
Type of Vitiligo	General	29	90.6%
	Localized	3	9.4%
Hair Involvement	Yes	17	53.1%
	No	15	46.9%
Family History	Positive	12	37.5%
	Negative	20	62.5%
Skin Type	Type III	15	46.9%
	Type IV	17	53.1%
History of Previous Treatment	Yes	26	81.2%
	No	6	18.8%

Table 2: The number and percentage of patients according to response to treatment.

Percent of response to treatment	No. of patients	% of patients
Excellent > 75%	3	9.37
Good > 50-75	6	18.75
Moderate < 25 – 50%	14	43.75
Poor < 25%	9	28.12

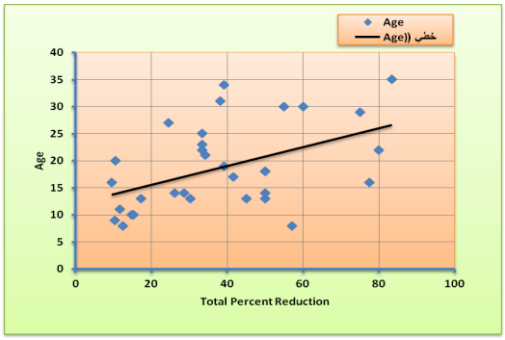

Figure 1: Correlation between age of patient and percent reduction (*r*= 0.474, p <0.006).

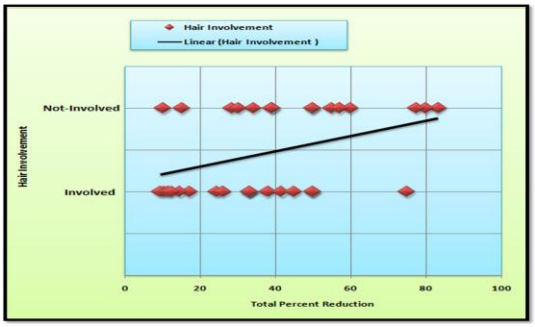

Figure 2: Correlation between hair involvement by disease and percent reduction (*r*=0.386, p < 0.0287).

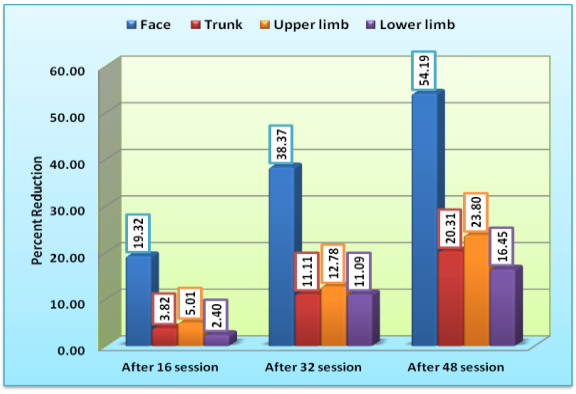

Figure 3: The area of maximum response.

Figure 4: Twenty years old female with generalized vitiligo eleven years duration.

A: at 1st session.
B: at 32 session
C: after completing 48 sessions

DISCUSSION:

The study of factors that predict the response to specific treatment in diseases has gained increasing interest in recent years, finding such factors will help in selecting the treatment modality suitable for individual patients. In this way the treatment option will be tailored for each individual. Different patient characteristics such as age, gender, ethnicity and skin phenotype were studied, however the important determinant is related to the genetic constitution of the individual. [7] An example on patients' characteristics that affect response is the response of slow acetylator to certain drugs and the effect of cytochrome 450 in response of drugs. [8]

Therefore the present study was conducted to evaluate the effect of certain factors such as age ,gender, the age of patient at onset , duration of disease, stability or not, the type of vitiligo, hair involvement ,family history , skin phenotype, and history of previous treatment on the response of NB-UVB in vitiligo patients. A statistically significant correlation was found only with two factors; age and negative hair involvement, other factors did not reach the statistical significant.

The reason that a statistical inference could not be reached may be related to the small number of patients included in the study.

The response also depends on the area of the body treated . The face had a favorable outcome with each treatment session. These factors will help in planning for future selection of patients and who are expected to benefit from the treatment. In comparing the result of therapy response of the current study with other previous studies; better results were reported by *Yashar* through which 39% achieving 66-100 % improvement.[9] *Natta R.* showed that 33% achieving > 75% repigmentation . [10] *Hamzawi* achieved 42.9% repigmentation rate after 60 sessions.[11]

Two Iraqi studies also demonstrated better responses, *Mohammed W.*(25% had exceed 75% reduction rate),[12] While in the present study only 9.4% of patients achieved >75% response and 28.2% achieved > 50% response.

The reasons which explain the better response in the fore mentioned studies were; first the number of sessions in the present study are 48 sessions

while in other studies were up to 100 sessions , the second is the failure of patient adherence to two sessions per week with missing of some sessions which interfered with the expected response.

Regarding the side effect, they were mild and no patient had to stop the treatment because of the side effects, this is comparable to other studies.

CONCLUSION:

NB UVB is an effective way of treatment to vitiligo patients with few side effects.

A number of factors seem to affect the response to treatment , some reached statistical significance such as the age of the patients , negative hair involvement , other factors affect but not to the degree of statistically significant as patient with type IV skin phenotype, older age at onset , localized vitiligo and male patients. The face is the area of maximum response.

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