

Narrowband ultraviolet B phototherapy improves the quality of life in patients with psoriasis

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ABSTRACT

الأهداف: التحقق من تأثير العلاج الضوئي بالأشعة فوق البنفسجية الضيقة المجال على تحسين نوعية الحياة لدى المرضى المصابين بالصدفية اللويحية.

الطريقة: لقد قمنا بجمع المرضى المصابين بالصدفية اللويحية (95 مريضاً) من عيادات الجلدية الخارجية في مستشفى القصيم الجامعي، بريده، المملكة العربية السعودية، وقد استمرت الدراسة من يناير إلى أكتوبر 2010م. لقد قمنا بإخضاع المرضى لثلاثة جلسات أسبوعية من العلاج الضوئي بالأشعة فوق البنفسجية الضيقة المجال وذلك لمدة 6 أشهر. شملت الدراسة المرضى الذين قاموا بإكمال الاستبيان المتعلق بمؤشر تأثير المرض على نوعية حياة المرضى قبل وبعد العلاج الضوئي، وهكذا فقد شملت الدراسة المرضى الذين قاموا بإكمال الاستبيان وكان عددهم 72 مريضاً، فيما تم استقصاء 23 مريضاً. لقد تم قياس الفروق الإحصائية في المعدل المتوسط والانحراف المعياري لقيم هذا المؤشر قبل وبعد العلاج باستخدام حزمة البرنامج أوريجين 6.1 من أجل تحليل نتائج اختبار تي أحادي الاقتران ذو الذيل الواحد مع تحليل التباين الأحادي (أنوفا).

النتائج: لقد أدى العلاج الضوئي بالأشعة فوق البنفسجية الضيقة المجال إلى تحسين نوعية الحياة لدى المرضى المصابين بالصدفية اللويحية، كما أنه أدى إلى التقليل من درجة شدة الصدفية ومساحة انتشارها. أشارت نتائج الدراسة إلى فعالية العلاج في تحسين مؤشر تأثير المرض على نوعية الحياة لدى المرضى الذكور والإناث ($p=0.00$). كما أن العلاج ساهم في تحسين نتائج المقياس البصري التماثلي ($p=0.00$).

خاتمة: لقد أثبتنا في هذه الدراسة مدى فعالية العلاج الضوئي بالأشعة فوق البنفسجية الضيقة المجال في تحسين نوعية الحياة لدى المرضى المصابين بالصدفية اللويحية.

Objectives: To examine whether narrowband ultraviolet B (NBUVB) phototherapy administration to plaque-type psoriatic patients leads to an improvement in patient's quality of life (QoL).

Methods: A total of 95 patients with plaque-type psoriasis were recruited in

the Outpatient Dermatology Clinics of Qassim University affiliated hospitals, Buraydah, Kingdom of Saudi Arabia from January to October 2010. The NBUVB phototherapy was administered 3 times a week for 6 months in a standardized fashion. Patients were asked to complete pre- and post-phototherapy Dermatology Life Quality Index (DLQI) questionnaire. Seventy-two patients were included in the study, while the remaining 23 were excluded, as they had not completed the post-phototherapy DLQI questionnaire. The statistical differences in mean \pm standard deviation of QoL were measured using Origin 6.1 software package (one paired two tailed t-test with one way analysis of variance) based on pre- and post-phototherapy questionnaires.

Results: The administration of NBUVB phototherapy to plaque-type psoriasis patients significantly improved the QoL, and was well-correlated with the reduction in psoriasis area and severity index (PASI) score. Data showed that DLQI significantly improved in both male and female patients ($p=0.00$) after NBUVB phototherapy. The visual analogue scale (VAS) scores also significantly improved ($p=0.00$) with NBUVB.

Conclusion: In this study, we found that NBUVB phototherapy improves the QoL of plaque-type psoriasis patients.

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It is well-documented that psoriasis has a major impact on the patient's quality of life (QoL), and results in significant daily stress for the patients.^{1,2} Plaque psoriasis is the most common type of psoriasis, and is characterized by a well-defined cosmetic disfigurement.¹⁻³ Depending on the severity and location of outbreaks, patients experienced significant physical and social discomfort, in which they may also feel self-conscious of their appearance, and have poor self-image that stems from fear of public rejection.³ Disease management represents other difficulties that may impair daily leisure and work-related activities.³⁻⁵ Clinical assessment of psoriasis treatment mainly relies on the physician's rating of different skin signs, as standardized in the Psoriasis Area and Severity Index (PASI) score.^{1,6,7} It is ideal that significant improvement measured by such ratings must always be reflected in a corresponding improvement in subjective QoL. Therefore, it is necessary to consider the patient's own assessment, which plays a significant part in healthcare. Thus, it is important for the dermatologists to use and develop QoL measurement techniques in the analysis of psoriasis.^{8,9} The Dermatology Life Quality Index (DLQI) questionnaire was developed as a simple and practical questionnaire for use in dermatology clinical settings to assess limitations related to the impact of psoriasis.⁸ The DLQI has 10 questions dealing with the subject's skin, which was based on the most commonly identified impacts upon dermatology-specific health related quality of life (HRQL) that were elicited from patients with psoriasis. The score of the DLQI has a possible range of 0-30, with 30 corresponding to the worst HRQL. The DLQI has evidence supporting reliability and validity when used in a dermatology setting.⁶ The DLQI was developed to contain many subscale scores such as: symptoms and feelings; daily activities; leisure; work/school; personal relationships; and treatment. In most studies on skin diseases involving the whole body, ultraviolet B (UVB) phototherapy have shown that narrowband (NB) UVB is superior to broadband UVB (BBUVB) for the treatment of psoriasis.¹⁰ It is now well-established that NBUVB phototherapy has been shown to be effective in reducing the extent of psoriasis, and producing a remission of variable duration.¹¹⁻¹³ In this study, we investigated whether patients with plaque-type psoriasis in the Kingdom of Saudi Arabia (KSA) experienced an improvement in QoL after treatment with NBUVB phototherapy.

Methods. Ninety-five consecutive plaque-type psoriasis patients inadequately controlled by topical therapies alone, and having no apparent contraindications on the use of phototherapy were included in this study. However, 23 patients left the clinic without completing the post-treatment

questionnaire, and were thus excluded from the study. The remaining 72 patients were referred for phototherapy in the Dermatology Clinics of Qassim University affiliated hospitals, Buraydah, KSA from January to October 2010. Ethical approval was obtained from the Institution Review Board of the College of Medicine, Qassim University, Buraydah, KSA. After explaining the expected benefits and risks of the treatment, the patients signed an informed consent form. Prior to the start of the study, minimal erythema dose (MED) was determined for each patient using untanned, and uninvolved skin of the lower back. Before each phototherapy session, liberal use of mineral oil was encouraged. A fluorescent lamp (Philips TL01 - 100W UVB Narrowband [Daavlin(Bryan, OH, USA)]) emitting a wavelength of 311 ± 2 nm, equipped in a Daavlin cabinet (Daavlin, Bryan, OH, USA) was used for phototherapy. The NBUVB irradiations were carried out 3 times per week. Starting NBUVB dose and dose escalations were standardized like those being applied in other international treatment centers.¹ This denotes an initial dose of 70% MED, followed by increments given at every visit according to the percentage of the previous dose, and the erythema response being increased by 20% if no reactions occurred due to previous treatment, repeated previous NBUVB dose, and 10% increment of previous dose subsequently if mild (grade 1) barely perceptible erythema developed: one treatment postponed, previous dose repeated at the next visit, and 10% increment subsequently if moderate (grade II), well-defined asymptomatic erythema occurred, and if severe reaction (grade III, painful erythema persisting for more than 24 hours, edema or bullae) developed, no treatment until resolution of symptoms, next dose reduced by half and 10% increment subsequently.

Dose increments were continued until the lesions cleared, which was defined as 90% reduction in PASI scores.¹ At clearance or 24 weeks, therapy was discontinued without tapering, or maintenance. The PASI score is the most widely used tool for the measurement of severity of psoriasis.^{5,9,10} The PASI is basically a composite index indicating the harshness of the 3 main characteristics of plaque psoriasis (erythema, scaling, and thickness) according to the amount of coverage of these plaques in the main body areas (head, chest, upper or lower extremities). The PASI scores can range from 0-72 with higher scores indicating greater severity as described previously.^{5,9} Visual analogue scale (VAS) was determined on the basis of itching, which was analyzed by the terms, "no itching" at 0 point, and "severe itching" at the 10 end of the scale.⁶ Before and after NBUVB treatment, subjects were asked to respond in terms of their itching. Every patient completed the DLQI questionnaire at the beginning, as well as, after the completion of the course of NBUVB phototherapy.

Data were analyzed using Origin 6.1 software package (one paired 2 tailed t-test with one way analysis of variance). Results were expressed as mean \pm standard deviation (SD) unless stated otherwise. $P < 0.05$ was considered significant.

Results. The study participants consists of 39 males and 33 females with a mean of 36.4 ± 11.1 , and mean disease duration of 4.71 ± 2.96 years. The results on the effect of phototherapy in the QoL of patients are shown in Table 1. There was a statistically significant difference in DLQI scores ($p=0.00$) both in the total and individual domains of the score before, and after NBVVB treatment. The mean PASI score in the 72 study subjects was found to be 11.48 ± 2.49 (before), and 0.78 ± 1.18 (after) NBUVB phototherapy, and

the difference was statistically significant ($p=0.00$). The VAS rating revealed that patients thought phototherapy significantly improved their psoriasis ($p=0.00$). Forty-five patients (62.5%) thought their psoriasis completely improved with phototherapy, while only 3 patients (4.2%) thought the psoriasis showed no improvement with phototherapy. The remaining 25 patients fell into various degrees of improvement. Table 2 shows the PASI, VAS, and DLQI for males and females. The results point out that both male and female psoriasis patients had shown significant improvement in the degree of disease, as well as their QoL after NBUVB treatment ($p=0.01$). The side effects noted were mild erythema and post-inflammatory hyperpigmentation (PIH), which did not affect the continuation of treatment. Mild erythema was noticed in 16 patients, and PIH occurred in 21 patients.

Table 1 - Effect of narrowband ultraviolet B phototherapy on the quality of life in psoriasis patients.

Parameters	Before treatment	After treatment
	Mean \pm standard deviation	
PASI	11.48 ± 2.49	$0.78 \pm 1.18^*$
VAS itch	3.94 ± 1.45	$2.47 \pm 0.93^*$
Pain	0.89 ± 0.49	$0.36 \pm 0.48^*$
Embarrassment	1.58 ± 0.67	$1.19 \pm 0.40^*$
Shopping	1.14 ± 0.56	$0.63 \pm 0.49^*$
Clothing	1.43 ± 0.50	$0.75 \pm 0.50^*$
Leisure	1.50 ± 0.50	$0.71 \pm 0.46^*$
Sport	1.11 ± 0.52	$0.82 \pm 0.48^*$
Working	0.96 ± 0.49	$0.44 \pm 0.50^*$
Partner	1.29 ± 0.49	$0.93 \pm 0.59^*$
Sexual	1.44 ± 0.50	$0.86 \pm 0.45^*$
Therapy	1.32 ± 0.47	$0.24 \pm 0.43^*$
DLQI	12.67 ± 1.70	$6.69 \pm 1.53^*$

* $p < 0.05$ versus before treatment. PASI - psoriasis area and severity index, VAS - visual analogue scale, DLQI - dermatology life quality index

Table 2 - Effect of narrowband ultraviolet B phototherapy on male and female patients with psoriasis.

Parameters	Males, n=39	Females, n=33
	Mean \pm standard deviation	
PASI score, treatment		
Before	12.02 ± 2.78	$10.84 \pm 1.93^*$
After	1.14 ± 1.35	$0.36 \pm 0.77^*$
VAS itch, treatment		
Before	4.31 ± 1.56	$3.52 \pm 1.20^*$
After	2.56 ± 0.94	2.36 ± 0.93
DLQI, treatment		
Before	12.72 ± 1.73	12.61 ± 1.68
After	6.62 ± 1.23	6.79 ± 1.85

* $p < 0.05$ versus males. PASI - psoriasis area and severity index, VAS - visual analogue scale, DLQI - dermatology life quality index

Discussion. Narrow-band ultraviolet B has been proven to be an effective treatment for patients with chronic plaque-type psoriasis, who have not been responding to topical therapies.^{11,12} A potential advance in this technique has been the introduction of NB fluorescent bulbs that deliver a narrower range than broadband with a peak at 311 nm, a wavelength that maximizes clearing of lesions relative to its erythemogenic potential. Several small-scale clinical studies have shown an improved response of psoriasis to this NB lamp compared with conventional broadband phototherapy,¹⁰ and this kind of phototherapy has now been used worldwide.¹¹⁻¹⁴

Psoriasis is well-known to affect HRQL.^{15,16} Individuals with psoriasis may also feel self-conscious of their appearance, and have poor self-image that stems from fear of public rejection, and psychosexual concerns.¹⁷⁻¹⁹ Psychological distress can lead to significant depression and social isolation.^{19,20} Therefore, it is important for dermatologist to keep this thing in mind that the improvement in PASI after treatment is not the only factor to evaluate the complete disease cure, but also equally important to know, whether the DLQI had improved or not.^{1,21} Thus, the primary goal of the dermatologists is to minimize the extent and severity of psoriasis to the point, at which this no longer substantially disrupts the patient's QoL.¹ In agreement with these views, we also studied the DLQI before, and after the course of NBUVB phototherapy. In the present study, we measured the improvement of life quality in patients with psoriasis by the administration of NBUVB treatment in a regimen of irradiation 3 times a week, which is in favor of the study conducted by Cameron et al.²¹ Our data clearly indicated that NBUVB treatment improves the psoriasis patient's social and relational ways of living, and subsequently on their QoL in both male and female patients.

Our data showed that the administration of NBUVB phototherapy to psoriasis patients significantly reduced the PASI ($p=0.00$), and there was a statistically significant difference in DLQI scores before and after NBUVB treatment ($p=0.00$), which clearly indicates that the course of NBUVB treatment significantly improved the QoL for both male and female patients. This clearly indicated that NBUVB treatment is gender independent. The statistically significant ($p=0.00$) difference in QoL between pre- and post-phototherapy with NBUVB treatments in our study is in accordance with the results in a study carried out by Lim and Brown.¹ Similarly, the VAS results in our study correspond with the results of the study carried out by Lim and Brown.¹ Lim and Brown¹ used PDI²² to measure the QoL in their patients, which contains 15 questions related to daily living activities, physical activities, and interpersonal relationships. Asawanonda et al²³ compared the efficacy of methotrexate (MXT) plus NBUVB phototherapy group versus placebo plus NBUVB phototherapy group in the treatment of plaque-type psoriasis. They found a reduction in the DLQI score in both groups, but there was no difference in the DLQI improvement between the groups. Prins et al²⁴ showed substantial improvement in HRQoL with short contact dithranol treatment and UVB phototherapy in psoriasis patients.

The limitation of the study includes the issue of patients in completing the post-treatment questionnaire. An appreciable percentage (24.2%) of patients left the clinics before the completion of treatment. In addition, most patients hesitated, while some refused to provide the answers of their interpersonal relationships. This is all due to the mismanagement of our system.

In conclusion, our results show that NBUVB phototherapy improves the perceived QoL of psoriasis patients, and this treatment is independent of the patient's gender. Future national studies are recommended to explore the efficacy of phototherapy treatment on patients' life quality in different dermatological disease including psoriasis.

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