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Evaluation the Efficacy of NB-UVB Treatment Alone in Comparison with Combination Therapy of NB-UVB and Oral Prednisolone in Treatment of Vitiligo

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Abstract

Background: The treatment landscape for vitiligo has witnessed diverse approaches yielding variable outcomes.

Objective: To discern the optimal approach in terms of both tolerability and efficacy by comparing Narrow Band Ultraviolet B (NB-UVB) phototherapy with adjunctive oral mini pulse (OMP) prednisolone tablets.

Patients and Methods: A total of eighty-seven individuals with progressive vitiligo were enrolled in a one-year study, with participants allocated randomly across three study groups through a continuous selection method. Group 1 received a combination of NB-UVB and OMP prednisolone tablets, group 2 underwent NB-UVB treatment only, and group 3 received OMP prednisolone tablets alone. Clinical assessments were conducted at three- and six-month intervals, and statistical analyses were performed utilizing descriptive and bivariate techniques, including the chi-square test, to gauge the significance of differences between the various groups.

Results: In Group 1 (NB-UVB + OMP), substantial improvement was observed in 41.4%, accompanied by moderate improvement in 44.8% of patients. Group 2 (NB-UVB) demonstrated marked improvement in 31.0% and moderate improvement in 38.0%. In Group 3 (OMP), a lower proportion experienced marked (13.8%) or moderate (3.4%) improvement. Chi-square test findings indicated that the combination of NB-UVB and OMP correlated significantly with marked and moderate improvement in contrast to OMP alone, with respective values of $\chi^2 = 6.434$ ($p = 0.001$) and $\chi^2 = 7.831$ ($p = 0.015$) after a six-month follow-up.

Conclusion: Through a comprehensive evaluation of three treatment modalities in vitiligo patients, it was established that the sole application of oral mini pulse steroids (OMP) held an adjunctive value, lacking substantial efficacy on its own. Remarkably, the amalgamation of Narrow Band UVB and OMP presented a clear advantage over either treatment administered independently.

Keywords: Vitiligo, NB-UVB, OMP, Prednisolone.

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Introduction

Vitiligo is a chronic skin disorder characterized by the loss of pigmentation in patches, resulting from the destruction of melanocytes in the skin. Vitiligo is a commonly occurring disorder whose origins remain unidentified, displaying distinct clinical features such as the emergence of white macules on the skin's surface [1]. The condition can cause significant emotional distress and affect the patient's quality of life [2]. The global occurrence of vitiligo has been estimated at around 0.5–2% of the total population, underscoring its widespread impact [3]. One of the primary goals of treatment for active vitiligo is to halt or slow down the progression of depigmentation and induce repigmentation in the affected areas. A range of therapeutic approaches have been explored to address this condition, yielding varying degrees of success [4]. Among the various treatment options available, narrowband ultraviolet B (NB-UVB) phototherapy and combined therapy with oral mini-pulse prednisolone have shown promising results [5]. Narrowband Ultraviolet B (NB-UVB) phototherapy involves exposing the affected skin to a specific wavelength of UVB light. This treatment is considered a first-line therapy for vitiligo due to its effectiveness and relatively low side effects [5, 6]. NB-UVB is thought to stimulate melanocytes' activity and migration to the depigmented areas, leading to re-pigmentation [5, 6].

Clinical studies have demonstrated positive outcomes with NB-UVB treatment for active vitiligo [6]. Oral mini pulse (OMP) prednisolone is a corticosteroid medication that can suppress the immune system's activity and control the inflammatory response that may contribute to the destruction of melanocytes. By reducing inflammation, which is believed to play a role in vitiligo progression, it can create a more favorable environment for re-pigmentation [7]. However, it's essential to acknowledge that long-term use of oral steroids carries potential risks and side effects [7,8]. While complete re-pigmentation might not be attained in all cases, a consistent achievement of 50–75% re-pigmentation can be anticipated, particularly in cases of vitiligo that have recently developed [9]. It's important to acknowledge that a significant subset of patients may only attain partial repigmentation even when subjected to the most advanced therapeutic methods available [10]. As a strategic approach, practitioners might choose to rotate or combine therapies in order to enhance overall re-pigmentation rates while simultaneously minimizing any adverse effects associated with treatment [11]. This underscores the complex nature of vitiligo management, where the primary objectives encompass not only facilitating re-pigmentation but also curbing the progression of the disease. The variability in the severity of vitiligo is closely tied to two key factors. Firstly, the extent of the affected area plays a pivotal role, ranging from localized focal depigmented patches to more widespread lesions that span the body. Secondly, the stability of the disease further shapes its presentation, with some cases remaining relatively stable over time, while others might exhibit fluctuations or progression [12, 13]. This study aims to compare the impact of using NB-UVB phototherapy alone or in

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combination with oral mini pulse prednisolone tablets in the treatment of vitiligo.

Patients and Methods

Study Design

A one-year prospective study was designed to compare the data of vitiligo patients who have undergone treatment from June 2022 to May 2023 at the dermatology outpatient clinic, Baquba Teaching Hospital, Diyala, Iraq. The study adhered to the principles of the Declaration of Helsinki. The approval of the study was guaranteed by the ethical committee at the College of Medicine, University of Diyala, Iraq (Reference number 2023/219).

Inclusion and exclusion criteria

All patients diagnosed with active vitiligo and generalized vitiligo, aged 10 years and older, both genders, and willing to participate in the study have been included. However, cases of stable vitiligo, focal vitiligo, and segmental vitiligo, patients with comorbidities such as high blood pressure, diabetes mellitus, a history of photodermatitis or photosensitivity, lactating and pregnant women, and those unwilling to participate have been excluded from the study.

Sample size calculation

According to previous studies [14, 15], researchers assumed a fifty-percentage reduction in the control group (topical steroid) at a seven-percentage level of significance and a power of eighty to calculate a sample size of eighty-four. A dropout of ten percent was allowed. The total population was ninety-two people, with vitiligo included in the study. Fife patients have been excluded due to exclusion criteria, resulting in 87 patients in the final sample.

Procedure and protocol of treatment

During the study period, all patients underwent a comprehensive assessment that included a thorough clinical history, photographic documentation, general clinical examinations, and complete dermatological evaluation. The medical history of each patient was recorded, encompassing socio-demographic variables, vitiligo onset, course, and duration. Specific details were collected regarding any previous vitiligo-like lesions, such as their number, location, duration, prior treatments administered, and any observed side effects. Family history, systemic diseases, and medication intake were also documented. Clinical and dermatological examinations were performed, involving a comprehensive assessment of the skin, hair, nails, and thyroid gland. For assessing the severity and characteristics of vitiligo lesions, the Vitiligo Extent Score was employed. This scoring system helped determine the extent, site, size, center, and margins of the depigmented lesions. Baseline images of the vitiligo-affected areas were captured for all patients using a digital camera under standardized lighting conditions before initiating any therapy. These images served as reference points for subsequent visits and for the final documentation at the end of the study. Before starting the intervention, patients were explicitly instructed to discontinue any topical and systemic vitiligo treatments for at least three weeks. Moreover, patients were prohibited from using any other vitiligo therapies during the study period unless they first consulted the designated researcher. This measure aimed to ensure accurate evaluation and avoid any

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interference from other treatments during the study.

Therapeutic modalities used to treat vitiligo in this study:A total of 87 eligible patients with active vitiligo were equally assigned into three different groups (G 1, G 2, G 3) as follows;

Group 1: has 29 patients who were receiving both oral mini pulse prednisolone tablets and narrow band UVB (NB-UVB) therapy. The dose of OMP oral mini pulse prednisolone tablets was 40 mg/day given on two consecutive days per week for 8 weeks. The initial dose of NB-UVB administered to these patients was 0.3 J/cm², and the dosage was increased in increments of 0.1 J/cm² with each dose. The maximum dosage of NB-UVB that was administered to these patients was 3 J/cm² given twice weekly in two days interval for up to 30 sessions.

Group 2: Patients who treated by only NB-UVB therapy given twice weekly in two days interval for up to 30 sessions.

Group 3: Patients who treated only by oral mini pulse prednisolone tablets (40 mg/day on two consecutive days per week for 8 weeks).

Prior to commencing NB-UVB therapy, each patient was given a thorough explanation and guided tour around the phototherapy units. During this counseling session, they were educated about the safety profile of the treatment, emphasizing the significance of adherence and compliance to the prescribed regimen. Additionally, the limitations and potential outcomes of the therapy were discussed to ensure the patients had a comprehensive understanding of the procedure. Aftercare: Follow up every 12 weeks to detect efficacy and complications and for subsequent injections.

Outcome

At the end of three and six months, a clinical assessment was conducted. The degree of improvement was classified into distinct categories: significant improvement (> 75% re-pigmentation), moderate improvement (50–75% re-pigmentation), slight improvement (25–50% re-pigmentation), and limited or no improvement (< 25% re-pigmentation). Comprehensive documentation of any observed side effects was recorded for each case.

Statistical Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 23. Numerical data were summarized using means and standard deviations. Categorical data were summarized as numbers and percentages. For categorical variables, differences were analyzed with the chi-square test. A statistically significant is considered to be less than 0.05.

Results

Eighty-seven patients were involved in this study, with a mean age (SD) of 19 (SD 7.3) years and a range of 10-38 years. More than half of them were female (51.7%), aged 20–29 (44.8%), and unemployed (56.3%) Table (1). The demographic features look comparable in the three groups, as shown in Table (1). Table (2) presents some of the clinical characteristics of the participants. About two-thirds of them (63.2%) have a disease history of less than one year; three patients had a positive family history of vitiligo; and 29.9% had a history of comorbidities.

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Table (1): Sociodemographic characteristics of patients (n=87).

Variables	Categories	Total	Group 1 n=29	Group 2 n=29	Group 3 n=29	p-value
Gender	Male	42(48.3)	13(44.8)	14(48.3)	12(41.4)	0.237
	Female	45(51.7)	16(55.2)	15(51.7)	17(58.6)	
Age	10-19	35(40.2)	11(37.9)	10(34.5)	13(44.8)	0.201
	20-29	39(44.8)	12(41.4)	12(41.4)	11(37.9)	
	30 and more	13(15.0)	6(20.7)	7(24.1)	5(17.3)	
Occupation	Employed	38(43.7)	13(44.8)	12(41.4)	14(48.3)	0.071
	Unemployed	49(56.3)	16(55.2)	17(58.6)	15(51.7)	

* G 1: Combined NB-UVB + OMP prednisolone tablets. G 2: only NB-UVB; G 3: only OMP prednisolone tablets

Table (2): Clinical features of patients (n=78).

Variables	Categories	Total n=87	Group 1 n=29	Group 2 n=29	Group 3 n=29	p-value
Duration (years)	< 1	55(63.2)	16(61.5)	17(65.4)	20(77.0)	0.365
	1-5	18(20.7)	6(23.1)	7(26.9)	5(19.2)	
	> 5	14(16.1)	4(15.4)	2(7.7)	1(3.8)	
History of Comorbidities	Hypertension	7(8.1)	2(6.9)	3(10.3	2(6.9)	0.327
	Diabetes millets	4(4.6)	2(6.9)	1(3.5)	1(3.5)	
Family history	Vitiligo	3(3.5)	0(0.0)	1(3.5)	2(6.9)	0.292

* G 1: Combined NB-UVB + OMP prednisolone tablets. G 2: only NB-UVB; G 3: only OMP prednisolone tablets

Response to treatment

Table (3) presents the assessment of patients' responses at the end of the first three months. In group 1 (NB-UVB + OMP), six patients (20.9%) achieved remarkable improvement (> 75%). Moderate improvement (50–75%) was reported among twelve patients (41.4%). Nine patients (31.0%) have mild improvement, and two patients have less than 25.0% improvement.

Twelve patients (41.4%) and ten patients (34.5%) showed mild and moderate improvement in group 2 (NB-UUVB), respectively, compared to three patients (10.3%) who showed marked improvement. However, there were four patients who had less than 25% improvement. In Group 3 (only OMP prednisolone tablets), most of the patients (69.0%) showed a poor response. Seven patients (24.1%) reported a mild response, and two patients (6.9%) had moderate improvement; however, none of them had marked improvement Table (3).

Table (3): Evaluation of re-pigmentation among three groups at the end of three months (n=87).

Protocol of treatment	< 25%	25-50%	50-75%	> 75%
G 1 (OMP+NB-UVB)	2 (6.9)	9 (31.0)	12 (41.4)	6 (20.9)
G 2 (NB-UVB)	4 (13.8)	12 (41.4)	10 (34.5)	3 (10.3)
G 3 (OMP)	20(69.0)	7 (24.1)	2 (6.9)	0 (0.0)

* G 1: Combined NB-UVB + OMP prednisolone tablets. G 2: only NB-UVB; G 3: only OMP prednisolone tablets

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Factors associated with three months re-pigmentation outcome in bivariate analysis

Table (4) shows the cross-tabulation to indicate the association with marked improvement (> 75%) and moderate improvement (50–75%). Patients in G1 (chi-square test ($\chi 2$) = 3.535, p = 0.004) and ($\chi 2$) = 5.624, p = 0.025) were significantly associated with the marked and moderate improvement compared to G 3 at three months, respectively. There was also a significant association between G 1 and G 2 at the same period ($\chi 2$ = 2.074, p = 0.033), and ($\chi 2$) = 1.536, p = 0.041), respectively.

Table (4): Factors associated with marked and moderate improvement at three months(N=78).

Improvement at three months	G 1 (n=29)	G 2 (n=29)	G 3 (n=29	$\chi 2$*	p-value	$\chi 2$**	p-value
(> 75%)	6/29 (20.9)	3/29 (10.3)	0 (0.0)	2.074	0.033	3.535	0.004
(50-75%)	12/29 (41.4)	10/29 (34.5)	2/29 (6.9)	1.536	0.041	5.624	0.025

* G 1: Combined NB-UVB + OMP prednisolone tablets. G 2: only NB-UVB; G 3: only OMP prednisolone tablets; *(G1 ve G2); **(G1 ve G 3)

After six months of study, the highest percentage of patients in group 1 (NB-UVB + OMP) had moderate 13 (44.8%) and marked (41.4%) improvement. None of the patients had poor improvement; however, four patients (13.8%) achieved mild improvement.

In Group 2, nine patients (31.0%) had marked improvement, and eleven patients (38.0%) showed moderate improvement, respectively. Mild and poor responses have been seen among seven (24.1%) and two (6.9%) patients, respectively .

In Group 3, only one patient (3.4%) achieved more than 75.0% re-pigmentation, and 4 patients (13.8%) showed moderate improvement, compared to 82.8% who showed either mild or poor improvement Table (5).

Table (5): Evaluation of re-pigmentation among three groups at the end of six months (n=87).

Protocol of treatment	< 25%	25-50%	50-75%	> 75%
G 1 (NB-UVB+OMP)	0 (0.0)	4 (13.8)	13 (44.8)	12 (41.4)
G 2 (NB-UVB)	2 (6.9)	7 (24.1)	11 (38.0)	9 (31.0)
G 3 (OMP)	14 (48.3)	10 (34.5)	4 (13.8)	1(3.4)

Factors associated with six months re-pigmentation outcome in bivariate analysis

Table (6) shows the cross-tabulation to indicate the association with marked improvement (> 75%) and moderate improvement (50–75%). Patients in G 1 (chi-square test ($\chi 2$) = 6.434, p = 0.001) and ($\chi 2$) = 7.831, p = 0.015) were significantly associated with the marked and moderate improvement compared to G 3 at three months, respectively. However, there was no significant association between G 1 and G 2 at the same period ($\chi 2$ = 3.870, p = 0.076), and ($\chi 2$) = 5.752, p = 0.064), respectively.

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Table (6): Factors associated with marked and moderate improvement at six months (N=78).

Improvement at three months	G 1 (n=29)	G 2 (n=29)	G 3 (n=29	*χ2	p-value	**χ2	p-value
(> 75%)	12/29 (41.4)	9/29 (31.0)	1/29 (3.4)	3.870	0.076	6.434	0.001
(50-75%)	13/29 (44.8)	11/29 (38.0)	4/29(13.8)	5.752	0.064	7.831	0.015

* G 1: Combined NB-UVB + OMP prednisolone tablets. G 2: only NB-UVB; G 3: only OMP prednisolone tablets; *(G1 ve G2); **(G1 ve G 3)

Discussion

In the present investigation, notable progress was observed among the participants. Specifically, six patients in group 1, constituting 20.9% of the cohort, exhibited marked improvement, while an additional twelve patients (41.4%) demonstrated moderate improvement. This improvement was witnessed over a three-month period during which narrowband UVB treatment was combined with OMP (oral mini pulse) prednisolone tablets. Nonetheless, the precise underlying mechanism of pigmentation that is triggered by UVB radiation remains shrouded in mystery. A hypothesis proposes the involvement of endothelin and tyrosinase, which are expressed by keratinocytes and may potentially contribute to the pigmentation response [16].

A distinct facet of our study emerged after the initial three months. Among the patients receiving narrow-band UVB treatment, a noteworthy 44.8% exhibited both marked and moderate improvement. In contrast, the percentage of patients displaying moderate improvement with OMP prednisolone tablets was considerably lower, at 6.9%. This divergence underscores the disparate impact of the two treatment approaches. Noteworthy research by Njoo et al. [17] delved into an open study involving 51 children grappling with generalized vitiligo. Over the course of a year, they employed narrow-band UVB therapy, resulting in the impressive finding that more than 75% re-pigmentation was achieved in a significant 53% of their patients [17].

This trend persisted in recent studies as well. Kanwar and colleagues tracked 26 children with generalized vitiligo who underwent narrow-band UVB treatment, revealing that more than 75% re-pigmentation was once again achieved. Further investigation encompassed a retrospective cohort of 109 patients. This particular analysis juxtaposed twice-weekly NB-UVB therapy with a more intensive three-weekly regimen, combined with topical fluticasone propionate and/or tacrolimus. Surprisingly, both treatment arms yielded analogous results, with the combined treatment showing a swifter onset of repigmentation [18]. Impressively, a randomized controlled trial involving 517 patients emphasized the effectiveness of combination therapy involving NB-UVB therapy through a hand-held unit and mometasone. This combination outperformed the use of corticosteroids alone, with a response rate observed in one-fourth of patients, particularly favoring those with vitiliginous lesions situated on the head and neck [19]. Recent systematic reviews further fortified the case for combination therapy. Specifically, the combination of topical tacrolimus and NB-UVB treatment emerged as superior to the application of NB-UVB

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alone [20, 22]. Nonetheless, it's important to highlight the findings of another meta-analysis, which showed no significant distinction between NB-UVB monotherapy and the combination of NB-UVB with calcineurin inhibitors [23]. This complexity underscores the multifaceted nature of treatment responses in vitiligo management.

After six months, our observations unveiled a noteworthy trend. Patients treated with a combined treatment of narrow-band UVB and OMP (oral mini pulse) therapy showed 86.2% moderate to marked improvement. Similarly, those who were treated with narrow-band UVB showed a commendable 69.0% rate of moderate to marked improvement. In stark contrast, merely 14.2% of those treated with OMP prednisolone tablets displayed comparable levels of improvement. While narrow-band UVB therapy spurred faster re-pigmentation, the combination of narrow-band UVB and OMP prednisolone tablets yielded synergistic effects surpassing the outcomes of either treatment employed individually.

Supporting our findings, a recent retrospective review encompassing 58 patients subjected to NB-UVB therapy showcased a consistent re-pigmentation of the skin, with 80% of patients sustaining this improvement one year after treatment. This was particularly significant in cases primarily characterized by non-segmental vitiligo [24].

The endeavor to explore alternative treatments was also evident in the work of Pasricha and Khaitan back in 1993. They experimented with oral mini-pulses of betamethasone and reported varying degrees of repigmentation in their patients. Specifically, 25% of patients experienced a 26–50% re-pigmentation, 7.5% achieved 51–75% re-pigmentation, and an encouraging 15% accomplished over 75% re-pigmentation [25]. In contrast, in our own study, the implementation of oral mini pulse (OMP) prednisolone yielded different outcomes. Only one patient (3.4%) exhibited marked improvement, whereas four patients (13.8%) demonstrated moderate improvement. Regrettably, mild and poor improvement was witnessed in 24 patients (82.8%).

Highlighting the significance of our findings, it's noteworthy that the group of patients receiving combined treatment (Group 1: NB-UVB + OMP) achieved improvement exceeding 75%. This outcome held statistical significance at the 5% level when compared with the group receiving only OMP treatment (Group 3) after three and six months. Employing statistical analysis through SPSS-23 and the Chi-square test, our investigations established that the statistically significant difference between Group 1 and Group 2 was present only at the three-month mark. This further underscored the fact that OMP therapy, among the three modalities examined, functioned primarily as an adjunct, helping to halt disease progression without providing significant inherent re-pigmenting efficacy. Nevertheless, it is important to acknowledge the presence of side effects experienced by our patients. These included tanning and erythema due to ultraviolet therapy, as well as bloating and weight gain attributed to oral steroid usage. These side effects align with those reported in earlier studies, underscoring the consistency of these observations across different research endeavors [17, 26, 27].

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Conclusions

In our study on progressive vitiligo, we made a significant discovery. Patients who underwent a combined treatment approach involving Narrow Band Ultraviolet B (NB-UVB) phototherapy along with oral mini-pulse (OMP) prednisolone tablets experienced substantial improvements in their condition. This combined therapy showed a clear and statistically significant advantage over using NB-UVB phototherapy or OMP prednisolone alone. Interestingly, when OMP prednisolone was used on its own, only one patient showed marked improvement, highlighting its limited efficacy as a standalone treatment. This suggests that OMP plays a supportive role and is most effective when combined with other treatments. These findings emphasize the importance of a holistic treatment strategy for progressive vitiligo. The synergistic effects of NB-UVB phototherapy and OMP prednisolone tablets offer a promising avenue for achieving better outcomes in patient care. Tailored and multifaceted approaches like these are crucial for managing progressive vitiligo effectively.

Recommendations

Further research and data are required to assess the incidence of vitiligo and any associated factors. Continued exploration through both basic and clinical research is essential to enhance our comprehension of vitiligo's underlying pathogenesis and to identify fresh avenues for therapeutic intervention. The landscape is rife with a multitude of promising forthcoming treatments, many of which are currently documented primarily through case reports and series. To ensure a more robust assessment of their effectiveness, however, a greater emphasis on conducting randomized controlled trials is imperative. These trials are pivotal in providing a more comprehensive and unbiased evaluation of the efficacy of these emerging therapeutic approaches.

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Ethical clearance: This study was conducted according to the approval of College of Medicine/ University of Diyala and in accordance with the ethical guidelines of the Declaration of ethical committee of the College (Document no. 2023YAK782).

Conflict of interest: Nil

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تقييم فعالية العلاج بالأشعة فوق البنفسجية ضيقة النطاق وحده بالمقارنة مع العلاج المركب من العلاج بالأشعة فوق البنفسجية ضيقة النطاق و البريدنيزولون عن طريق الفم في علاج البهاق

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الملخص

خلفية الدراسة: شهد المشهد العلاجي للبهاق طرقًا متنوعة تؤدي إلى نتائج متغيرة.
اهداف الدراسة: تسعى هذه الدراسة إلى تمييز النهج الأمثل من حيث التحمل والفعالية من خلال مقارنة العلاج بالأشعة فوق البنفسجية ضيقة النطاق مع جرع مخفضة من أقراص البريدنيزولون عن طريق الفم.
المرضى والطرائق: تم تسجيل ما مجموعه سبعة وثمانون من الأفراد الذين يعانون من البهاق التدريجي في دراسة لمدة عام واحد ، مع توزيع المشاركين بشكل عشوائي الى ثلاث مجموعات دراسة باستخدام طريقة اختيار مستمرة. تلقت المجموعة الاولى مزيجًا من الأشعة فوق البنفسجية ضيقة النطاق مع جرع مخفضة من أقراص البريدنيزولون عن طريق الفم, وخضعت المجموعة الثانية للأشعة فوق البنفسجية ضيقة النطاق فقط، وتلقى المجموعة الثالثة جرع مخفضة من أقراص بريدنيزولون عن طريق الفم فقط. وأجريت التقييمات السريرية على فترة ثلاث اشهر وستة أشهر، وأجريت التحليلات الإحصائية باستخدام تقنيات وصفية وثيقة المتغير، بما في ذلك اختبار مربع كاي لقياس أهمية الاختلافات بين المجموعات المختلفة.
النتائج: في المجموعة الاولى، لوحظ تحسن كبير بنسبة ٤١,٤ ٪ ، مصحوبة بتحسن معتدل بنسبة ٤٤,٨ ٪ من المرضى. أظهرت المجموعة الثانية تحسنا كبيربنسبة ٣١,٠ ٪ والتحسن المعتدل بنسبة ٣٨,٠ ٪. في المجموعة الثالثة ،كانت نسبة التحسن الكبيرأقل بنسبة ٣,٤٪, والتحسن المعتدل بنسبة ١٣,٨٪. أشارت نتائج اختبار مربع كاي إلى أن استخدام مزيجًا من الأشعة فوق البنفسجية ضيقة النطاق مع جرع مخفضة من أقراص البريدنيزولون عن طريق الفم بعد ستة أشهر متابعة يرتبط بشكل كبيرمع التحسن الملحوظ والمعتدل على النقيض من استخدام جرع مخفضة من أقراص بريدنيزولون عن طريق الفم فقط, والقيم ذات الصلة هي [مربع كاي ٦,٤٣٤ (P= 0.001) و نربع كاي ٧,٨٣١ (P= 0.015)]
الاستنتاجات: من خلال تقييم شامل لثلاث طرائق علاجية في مرضى البهاق ، ثبت أن التطبيق الوحيد للجرع المخفضة للبريدنيزولون يحمل قيمة مساعدة، ويفتقر إلى فعالية كبيرة من تلقاء نفسها. ومن اللافت للنظر أن دمج العلاج بالأشعة فوق البنفسجية الضيقة النطاق مع الجرع المخفضة للبريدنيزولون عن طرق الفم قدم ميزة واضحة وحتلا يمكن ان يتعامل بها و تدار بشكل مستقل.

الكلمات المفتاحية: البهاق, الأشعة فوق البنفسجية ضيقة النطاق، جرع مخفضة من أقراص بريدنيزولون عن طريق الفم

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