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Successful Psoriasis Treatment Using NB-UVB with Methotrexate: The Vietnamese Experience

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Abstract

AIM: To compare the effectiveness of narrowband ultraviolet B (NBUVB) and oral methotrexate (MTX) to oral MTX alone in Vietnamese psoriasis patients, from May 2016 to May 2018.

METHODS: We conducted a non-randomized trial on 70 patients with plaque-type psoriasis of moderate to severe. Thirty-five patients apply NBUVB once/day in 5 days/week for 4 weeks plus oral MTX 7.5 mg/week and 35 patients oral MTX 7.5 mg/week and both two groups treatment for 3 months. The extent of the lesion was assessed by the Psoriasis Area and Severity Index (PASI).

RESULTS: The proportion of decreasing PASI was comparable (68.49% in NBUVB and MTX versus 57.62% in MTX alone); $p < 0.05$. Inside, good 28.58%, moderate 68.57% and poor 2.85% in NBUVB and MTX better than good 2.85%, moderate 71.4% and poor 25.72% in MTX alone; $p < 0.05$. The recurrence rate after 24 months of the NBUVB and MTX group (42.9%) was lower than the MTX alone group (71.4%); $p < 0.05$.

CONCLUSION: NBUVB and oral MTX have affected treatment with chronic plaque psoriasis better than oral MTX alone.

Introduction

Psoriasis is a chronic skin disease. It happens to every gender, age and race develops in 1-3% world population [1]. The pathology of this disease is not fully understood. Until now, most authors consider it has a genetic base and autoimmune mechanism started with psychological distress, environment, infection, where Th17 and Th1 play a key role [2]. There are many methods and drugs used to treat psoriasis: topical ones, such as coal tar, salicylic, corticoid; systemic therapies like MTX, cyclosporine and biological drugs.

Narrowband ultraviolet B (NBUVB) have shown effectiveness in psoriasis treatment, few side effects, children tolerance and inexpensiveness. The result will be more promising if we combine the therapy with retinoid or MTX.

In Vietnam, the psoriasis treatment with NBUVB (UVB-311nm) in combination with low dose MTX has not been studied or reported. Because of this reason, our research evaluates the efficacy of this combination therapy.

Material and Methods

Study design

We conducted a non-randomized controlled trial on adults with chronic plaque-type psoriasis, from moderate to severe.

Including criteria: Patients with Fitzpatrick skin photo-types III and IV, age > 16 with no contraindication for UVB and MTX.

Excluding criteria: mild psoriasis and patients with contraindication for UVB and MTX.

Sample size: according to the formula of World Health Organization:

$n_1 = n_2 = \{[_{Z1\text{-}a/2}Ö[2P(1 - P) + Z_bÖP_1(1 - P_1) + P_2(1 - P_2)]\}^2 / (P_1 - P_2)^2$

n_1: Sample size of experimental group 1; n_2: Sample size of control group 2

$_{Z1\text{-}a/2:}$ reliability coefficient 95% (= 1,96); Z_b: validity (= 1,645)

$_{P1}$: percentage of good patients in NBUVB plus MTX group: estimation from previous studies was 85% (0.85); P_2: percentage of good patients in MTX alone: estimation from previous studies w as 55%. $P = P_1 + P_2/2$. Sample size of group 2 ($n_1 = n_2$) = 30 patients.

Treatment procedure

NBUVB and MTX group: Initial UVB dose was 500 mJ, increased after each treatment of 100 mJ until reaching minimal erythema dose or maximum dose, which was 2000 mJ. Lighted once a day, 5 consecutive days/week (from Monday to Friday) in association with methotrexate 7.5 mg/week on a fixed day, after dinner and phisiogel, twice a day, for four weeks. *MTX alone group:* Methotrexate 7.5 mg/week on a fixed day, after dinner and phisiogel twice a day for four weeks.

Both groups were treated for 4 weeks according to the study's guideline. After discharging both two groups continued oral MTX 7.5 mg/week until week 12. Monitoring for recurrence after 16 weeks and 24 weeks.

Applied techniques

To evaluate the disease activity according to PASI [3] $PASI = 0,1(E_H + I_H + D_H)A_H + 0,2(E_U + I_U + D_U)A_U + 0,3(E_T + I_T + D_T)A_T + 0,4(E_L + I_L + D_L)A_L$

Level :3 levels according to PASI: mild PASI: < 10, moderate: PASI: < 20, severe: PASI: ≥ 20. Evaluating the outcome: clinical improvement was evaluated through percentage decrease of PASI by using this formula:

% PASI = PASI before treatment-PASI after treatment/ PASI before treatment x 100

5 levels: very good: PASI decreases 100%; good: PASI decreases 75% - 99%; fair: PASI decreases 50 % ≤ 75%; moderate: PASI decreases 25% ≤ 50% and poor: PASI decreases < 25%.

Results

We recruited 35 patients from May 2016 to May 2018, to the NBUVB and MTX group and 35 to the oral MTX alone. Table 1 shows the baseline characteristics of the two groups, with no significant difference.

Table 1: Comparing the characteristics of the 2 groups. Note: the characteristics of 2 groups was similar, p > 0.05

Index	Experimental group	Control group	P
Mean age	51.46 ± 8.9	52.03 ± 9.3	> 0.05
Gender: male/female	30/5	30/5	> 0.05
Disease activity: moderate/severe	23/12	27/8	> 0.05

The treatment outcome of NBUVB and MTX group shows the proportion of decreasing PASI 68,49%, better than MTX alone (57.62%); p < 0.05 as shown in Table 2.

Table 2: Comparing the general outcome of 2 groups

Group	n	PASI before treatment	PASI after 4 weeks of treatment	PASI decrease	
				Number	%
NBUVB + MTX group	35	17.39 ± 6.3	5.48 ± 2.6	11.91	68.49
MTX alone group	35	16.66 ± 5.2	7.06 ± 2.8	9.6	57.62
p			< 0.05		

Note: The treatment outcome of NBUVB plus MTX group was better than MTX alone group, with p < 0.05.

The treatment outcome of experimental group and control group was 88.57% and 74.28% respectively, p < 0.05. Inside, good 28.58%, moderate 68.57% and poor 2.85% in NBUVB and MTX better than good 2.85%, moderate 71.4% and poor 25.72% in MTX alone; p < 0.05 as shown in Table 3.

Table 3: Comparing the treatment outcome according to the evaluation levels of 2 groups

Result	NBUVB + MTX group	MTX alone group	p
Very good	0	0	
Good	10/35 (28.58%)	1/35 (2.85%)	
Moderate	24/35 (68.57%)	25/35 (71.43%)	< 0.05
Poor	1/35 (2.85%)	9/35 (25.72%)	
Total	35 (100%)	35 (100%)	

Note: The treatment outcome which was evaluated as good and moderate of NBUVB plus MTX group and MTX alone group was 88.57% and 74.28% respectively, p < 0.05.

The recurrence rate after 24 months of the NBUVB and MTX group (42.9%) was lower than the MTX alone group (71.4%); p < 0.05. The side effects of 2 groups: Red blood cells, white blood cells, platelets, AST, ALT, urea, creatinine of 2 groups before treatment and after treatment 4 weeks were in

normal range. 5 patients in the experimental group referred a headache: 2 nausea, 2 erythema while in the MTX alone group: 3 nausea, 3 a headache. No patients had to discontinue treatment because of these side effects.

Discussion

According to Table 2, the experimental group showed PASI decreased 68.82% from 17.39 to 5.48 after 4 weeks treatment in hospital. Methotrexate alone group, PASI decreased 57.62% from 16.66 to 7.06 after 4 weeks. In conclusion, both groups had treatment efficacy, but NBUVB and MTX group were better than the control group, $p < 0.05$. Combined NBUVB and methotrexate were more promising than methotrexate alone in psoriasis treatment, but recurrence after 3 months, 6 months of 2 groups was not different [4]. Our study outcome was similar to Soliman et al. research, demonstrating that methotrexate and NBUVB are superior to methotrexate alone.

In Mahajan et al., study (2010) experimental group achieved PASI-75 faster than the control group, which used only UVB and placebo [5]. In conclusion, Mahajan's study result was not different from our research showing that the combination is more effective than NBUVB or methotrexate alone. According to Wolf et al., (2012), a combination of NBUVB and ustekinumab showed a better result than ustekinumab alone [6], and NBUVB with adalimumab demonstrated the same result [7]. According to Paul et al-1982, methotrexate plus UVB for 26 psoriasis vulgaris patients cleared lesions faster and decreased the dose of both methotrexate and UVB [8].

Evaluating the clearance of lesions or PASI decrease, table 3 showed that NBUVB and low dose methotrexate group and methotrexate alone group had good (28.58% and 2.85%), moderate (68.57% and 71.43%) and poor (2.85% and 25.72%) result, respectively. In conclusion, NBUVB plus MTX group had a better response than MTX alone group, $p < 0.05$. We think this result is suitable for the indication of these drugs. Moreover, in clinical practice, we used NBUVB for mild and moderate patients achieving good results. So moderate and severe patients used methotrexate even low dose can still acquire good response because both treatments inhibit interferon gamma and Th17 [9], [10], [11].

After four weeks treatment, the mean value of tests involving hematopoietic function (red blood cells, white blood cells, platelets), liver function (AST, ALT), kidney function (urea, creatinine) of both groups before and after treatment, were in normal range. Side effects included nausea, headache, erythema and pruritus happened in a few patients, and no one had to stop the treatment.

The recurrence rate after 24 weeks of the control group was 71.4% higher than the experimental group (42.9%). This difference had statistical significance with $p < 0.01$. These results showed that NBUVB plus methotrexate has not only better efficacy but also longer disease stability than methotrexate only. In literature, NBUVB is effective in psoriasis and had few side effects and can use for both children and pregnancy.

In conclusion, NBUVB and oral MTX have affected treatment better than oral MTX alone with chronic plaque psoriasis in Vietnam.

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